Master of Public Health Field Experience Report

A COMMUNITY BASED PRIMARY HEALTH CARE APPROACH TO WATER, SANITATION, AND HYGIENE (WASH) IN RURAL NICARAGUA

by

SOHAILA JAFARIAN
MPH Candidate

submitted in partial fulfillment of the requirements for the degree

MASTER OF PUBLIC HEALTH

Graduate Committee:
Ellyn Mulcahy, Ph.D., MPH
A. Sally Davis, Ph.D., DVM
Justin Kastner, Ph.D.

Field Experience Site:
AMOS Hope and Health
June 5, 2016 – August 6, 2016

Field Experience Preceptor:
Laura Chanchien Parajon M.D. M.P.H.

KANSAS STATE UNIVERSITY
Manhattan, Kansas

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Summary

Proper water, sanitation, and hygiene (WASH) practices are crucial to reduce disease in rural communities. In 2015, AMOS Health and Hope implemented a pilot program in the rural community of Banco de Sikia, Nicaragua that educated and empowered community health workers to promote improved WASH behavior. Baseline data for WASH practices in the community was collected via door-to-door knowledge, aptitude, and practices (KAP) surveys. Six members of the community volunteered to be trained as Water Promoters, each delivering monthly WASH education and counseling to between eight and twelve houses in the community. The Water Promoters' WASH training was directed to address unhealthy behavioral practices that were identified through the baseline KAP surveys.

In 2016, post-intervention KAP survey data was collected to assess overall impact of the Water Promoters in Banco de Sikia. The empowerment-based approach that was utilized was found to be highly effective in improving key KAP indicators while simultaneously decreasing the disease burden of the community. Based on these positive results, the program was extended to the community of El Bambu, Nicaragua in 2016. Baseline KAP surveys were conducted and were used to guide a new group of Water Promoter volunteers.

To improve and enable data integrity, a handheld GPS device was used to collect the geographic coordinates of each home that was visited and associate the location with the name of the head of the household and the status of their water filter.

We found the program to be highly successful in not only reaching a majority of the rural community members, but also in making healthy WASH behavior changes within the community. We anticipate this novel approach of implementing WASH training using community-based, primary health care principles to be an effective and valuable method of delivering WASH topics to the most affected areas around the world. To effectively gauge long-term impact, progress in WASH practice adoption should continue to be evaluated in these communities.

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Chapter 1 - Scope of Work

AMOS Health and Hope

Mission, vision, and values

AMOS is a Christian, non-profit organization that exists to improve the health of impoverished communities by working alongside them to improve health, education, and development. The organization seeks health for all people, a world where no child dies of a preventable disease, and effective and empowering health care through community partnerships.

The idea for AMOS originated in 1967 when Dr. Gustavo Parajón returned to Nicaragua after attending medical school in the United States. The overwhelming need for medical care in the poorest, most remote rural communities was blatant. He realized that the traditional approach to medicine would not work for these communities. He often commented that "In Nicaragua, a doctor shouldn't just be a doctor; a doctor must also be a teacher." This led to the development of a broad health care initiative based on community based primary health care with a focus on empowerment and local leadership development.

AMOS as an organization was created in 2001 by Dr. Gustavo Parajón's son and daughter in law, Drs. David and Laura Parajón, to build on Gustavo's work in Nicaragua. What began as a small health care project of 13 communities in the municipality of San José de los Remates grew to encompass 27 communities in 4 departments covering over 13,000 people, outlined in Figure 1 (AMOS, 2016).

MATAGALPA

Apantillo	Ada Luz Montenegro
El Socorro	Isaac Fley
Fila Grande	Petronilo Gaitán
Sabalete	Pedro Pablo Guillén
San Jose de la Mula	Juan de Dios Blandón
Tapasle	Salvador López

RAAS

Banco de Sikia	Gerson Ortiz & Ismael Sequeira
El Bambú	Jose Gomez
El Cedro	Agustín Malueños
La Danta	Luis Eliezer Olivas
Nawawasito	Ramón Barrera

BOACO

Bajos de Tomatoya	Elia Eloisa Urbina
Cumaica Norte	Catalino Jarquin
El Coyol	Betty González
La Majada	Ana Delfina Morales
Malacatoya 1	Fatima Gonzalez
Malacatoya 2	Rosabilda Velásquez
Nacascolo	Victor Urbina
San Onofre	Timotea Romero
Tierra Blanca	Yadira Sevilla

CHINANDEGA

Calderón	Silvina Lainez
El Obraje	Ramiro Morales
La Consulta	Isabel Peralta
La Pimienta	Daniel Zuniga
Rancho Pando	Nahum Zuñiga

Figure 1: Areas of Need Served by AMOS

AMOS summarizes its core values into six major topics (AMOS 2016):

- *Service to Those in Need*: Our vision is to provide high quality health services to people in need who lack access to adequate health care.

- *Respect*: We serve those in need without distinctions based on gender, age, color of skin, ethnicity, religious affiliations or other beliefs.

- *Loving Our Neighbor*: We focus on the vulnerable sectors of society in Latin America — people living in extreme poverty, especially women and children.

- *Empowerment for Service*: We teach local leaders to identify problems according to local needs, develop solutions and implement health interventions that are beneficial for the whole community, especially those who are most vulnerable.
- *Stewardship*: We seek sustainable and effective approaches to global health problems through partnerships with local communities, churches, governments, individuals and other organizations.
- *Peace and Justice*: We seek a world of peace where there is health and hope for all.

Community Based Primary Health Care Model

The idea of community based primary health care (CBPHC) originated with "The Declaration of Alma-Ata" that was adopted at the International Conference on Primary Health Care in 1978 (WHO 1978). By defining health as a fundamental human right, it promoted inter-sectoral development of health care and declared that primary health care "requires and promotes maximum community and individual self-reliance and participation in the planning, organization, operation and control of primary health care" (WHO 1978).

AMOS adopted and adapted the CBPHC model (Appendix 1) to fit the unique needs of Nicaragua's most vulnerable. Before initiating health programs within a community, the organization spends approximately a year working through the steps of their CBPHC model to ensure a strong, sustainable, and equitable working relationship.

The CBPHC model begins by building a three-way partnership between the Nicaraguan Ministry of Health (MINSA), the community, and AMOS. This is accomplished by developing a relationship of trust between the three entities, sharing resources, and working together to meet the common health goals. Once a partnership is established, geographic boundaries of the community are defined to create a border and create a specific, targetable region. After establishing boundaries, community mobilization activities are initiated to identify the strengths of the community, select a health committee comprised of community members, and organize training for the committee that includes asset-strengths mapping, community census collection, data collection, and community mapping.

Once a foundation is established, the focus shifts to determining the epidemiological and community priorities through census analysis, focus groups, and photovoice. Photovoice uses a Freirean-based process to (Freire 1970; Robert et al. 2010):

- Engage people in observing and dialoguing about their communities
- Create safe environments for critical reflection of why current realities exist
- Move individuals with increased levels of critical consciousness toward action
- Motivate the social power structures to initiate community change

The priorities or "the problem" are presented in a way known as a "starter", given its name and outlined by Paulo Freire (Freire 1970). The starter can be presented in any form but must have certain characteristics including:

- It must portray only a single, simple, specific problem
- It must be clear and thus easily understood
- It must be relevant and close to the hearts and experiences of the students
- It must pose a problem
- It must not pose solutions to that problem
- It should sensitize students to the problem and its relevance to their own lives
- It should generate an emotional response so they can think for themselves in a way that leads them into action for change
- It should not transmit new knowledge but should remind the observer of what is already known

By beginning their community health model with these activities, AMOS and the local community members are able to work together to find a balance between community and epidemiological priorities. After agreeing on the most important priorities for the community, AMOS begins initiating the co-learning and capacity building processes for program planning and initiation. This is done through methods including the SHOWeD method seen in Figure 2 (Shaffer 1986). SHOWeD is utilized to explore solutions to the starters presented through photovoice. During this time members of the health committee receive specific training that helps them demonstrate, motivate, facilitate, and encourage new habits within their community. Techniques including

restorative justice practices are utilized to resolve conflicts between community members.

Question	Explanation of the purpose of the questions
1) What things do you **SEE?**	Have the **people** and the **physical objects** portrayed by the starter been properly recognized by the students? This is mainly a clarification question to assure that everyone is seeing the **same thing.**
2) What is **HAPPENING**? Define the **PROBLEM**	Did students recognize the problem-posed as being a **PROBLEM**? In their minds was it an issue? **This is a key question.**
3) Does this problem happen in **OUR** community?	Is it **relevant** to and does it reflect the students' personal experience? The question is intended to personalize or internalize the problem, to "plant" it in the soil of their own thinking, experience, and sensitivity. To deepen the emotional and personal aspects. You can use the question "how do you feel about the problem".
4) **WHY**. What are the solutions to this problem?	This question is designed to evoke causation of the problems. Also, what are the complications arising from this problem? What are the **CONSEQUENCES** if we don't do anything?
5) **EDUCATE**	Now that we know more about what is going on, how are we going to **EDUCATE** others about the problem?
6) What are we, here and now, going to **DO** about this problem?	What **solutions** are there? This is an **ACTION** question leading to subsequent questions such as: **Who? Where? When? How?,** etc. These subsidiary questions take them to the community where the real problem is waiting to be acted upon. Emphasis is on what we can do **locally and immediately**

Figure 2. SHOWeD Method

Following the training of the health committee, a group of volunteer community health workers are trained by AMOS staff on basic health care, recognizing and referral of common illnesses, treatment of serious childhood illnesses, and basic maternal and child health. This group of volunteers is then responsible for the ongoing participatory monitoring and evaluation of projects within the community. Data is collected, interpreted, and analyzed by teams that include AMOS staff members, community health volunteers, and the community health committee. The data is shared with the

community and, if necessary, changes are implemented. This process reinforces the partnership and continued engagement with the CBPHC projects.

AMOS covers a wide range of health topics and uses community based primary health care methodology to address the unique needs of rural and urban communities. Rural community health programs include: community nutrition, clean water, healthy schools, patient care, photovoice, youth empowerment, and volunteer mothers (AMOS 2016).

AMOS' Approach to Water, Sanitation, and Hygiene

AMOS has developed a variety of WASH modules adapted from different organizations. One widely-utilized WASH program in Latin America is The Familia, Escuela, y Comunidad Saludables (FECSA) program. FECSA promotes healthy families, communities, and education by encouraging behavioral change, developing good health and hygiene habits, and promoting environmental awareness and best practices (Thomas 2015). By combining the FECSA WASH program with training and modules from other organizations including the Centre for Affordable Water and Sanitation Technology, Red Cross International, and the Foundacion Hespieran, AMOS has been able to adapt its program to fit the needs and resources of rural Nicaraguan communities. To assist in ongoing program evaluation, AMOS developed a program theory and logic model to guide questions for KAP and water filter supervision surveys (Hosley 2005).

In 2013, AMOS initiated a WASH program that specifically targeted implementation into rural schools. However, many barriers prevented the program from becoming fully-established. When Daniel Ortega's government introduced free education in 2006, the Ministerio de Educacion (MINED) took control of all schools in Nicaragua. This resulted in the creation of many strict governmental regulations related to school curriculum, and created insurmountable obstacles for the AMOS WASH education plan. In response, AMOS adapted their WASH modules to focus at the community level by directing resources to support the adoption of point-of-source water filters in rural communities.

AMOS has introduced water filters into all of the communities in which it currently works and has provided the basic training on how to correctly use and maintain the water filter. In 2015 AMOS started the Water Promoter program in Banco de Sikia, as a way to implement WASH training in the communities. Water Promotors (Promotores de Agua Comunitarios or PAC) are members of the community who are selected and trained by AMOS staff on WASH topics and who then maintain direct communication with families through home visits that create an individualized and local approach to implementing WASH within the community. Each Water Promoter is trained in the six themes relating to water, sanitation, and hygiene and is responsible for eight to ten families in their community that they are tasked with visiting twice a month for a six month period. The six main themes each Water Promoter is trained in are personal hygiene, house hygiene, use and management of water, use and management of latrines, proper waste management, and protection of water sources and the environment.

Evaluating overall program effectiveness is vital when deciding whether or not to continue a resource-intensive project like the Water Promoter program. With different implementations across the globe, it is difficult to theorize how successful any given type of WASH education will be in a specific country or region. What works well in Bangladesh may completely fail in Nicaragua. Without attempting novel and cultural-specific implementations, new WASH projects may ultimately have a decreased chance of success, which ultimately hurts not only the local community members but the international community, as well. Therefore, this work also attempts to provide resolutions for some of the difficulties observed in previously presented studies. By capturing interim behaviors, we were able to fully utilize systematic data on process indicators. Finally, it aims to drastically reduce or eliminate known knowledge-behavior gaps caused by financial restraints by providing solutions that are low-cost or cost free.

From June to the beginning of August 2016, the AMOS water interns, of which I was one, worked in three distinct areas of AMOS WASH programs: second year data collection and evaluation of Water Promoter program effectiveness, baseline data collection, and Water Promoter training. Each of these project areas was necessary and relevant to support WASH implementation within rural communities. These distinct

areas of focus were separated into two different projects within two different communities. The first was a one-year impact assessment of Water Promoter education and counseling in the community of Banco de Sikia. The second was the collection of baseline data and adaptation of methodology to train Water Promoters in the community of El Bambu.

Chapter 2 - Learning Objectives

Activities Performed

The mentorship for the internship was headed by Dr. Laura Parajon, M.D., M.P.H. the co-founder and Medical Director of AMOS. Dr. Parajon was an integral player in the design and implementation of the internship. However, there were many other mentors involved in guiding interns through this immersive global health experience including Dr. Renee Kusler M.D., M.P.H., DTMH Medical Coordinator of Educational Programs at AMOS, Lester Lorente the head of the Clean Water programs, Desiree Sanabria head of the internship program, and Jessica Hinshaw M.P.H. head of the clean water internship program.

All internships at AMOS begin with a three-week Global Health Practicum that includes:

1) Nicaraguan cultural and historical orientation, intercultural development
2) Introduction to critical theory, power and privilege, and critical consciousness; finding out social location
3) Analysis of current models for global rural health care
4) Burden of disease and AMOS interventions
5) Millennium Development Goals (MDG's), Sustainable Development Goals (SDG's), Global Economics, and Neoliberal Policies: Impact on Nicaragua
6) Introduction to CBPHC: History, Alma Ata, and Nicaragua; Introduction to Community Based Participatory Research (CBPR) Principles and Methodology
7) A Review of Social Determinants of Health
8) Introduction to Community Empowerment: Theory and Philosophy
9) Development of public health skills through survey administration workshops
10) Material validation
11) Monitoring and evaluation, curriculum development, exposure to fieldwork and rural health care setting
12) Child and maternal health interventions
13) Clean water interventions

14) Technical report, donor report, and community report development and
   presentation

15) Cultural and Narrative Humility, Debrief, and Faith and Health

Once the practicum concludes, interns are assigned different public health
projects. Projects that the water interns were directly involved in are listed below Table
1: Activities Performed, other intern projects are not outlined in this report.

Table 1: Activities Performed

Objective	Activity	Product(s)

(1) Nicaraguan Cultural and Historical Orientation	• Readings:
	     ○ Chasteen, John. "Colonial Crucible" in Born in Blood and Fire: 63-87
	     ○ Al Jazeera, "Nicaragua: An Unfinished Revolution." Parts 1-4. 2009
	 • Lectures:
	     ○ Nicaraguan culture by Desiree Sanabria
	     ○ Critical approach to the history of Nicaraguan	

(2) Introduction to Critical Theory, Power and Privilege, and Critical Consciousness; Finding out Social Location	• Readings:
	     ○ Farmer, Paul. "On Suffering and Structural Violence" in Pathologies of Power: 29-50. 2004
	     ○ Love, Barbara J. "Working for Social Justice: Developing a Laboratory of Conciousness". 470-474.
	     ○ Glossary of Freirian Terms
	     ○ McIntosh, Peggy. "White Privilege: Unpacking the Invisible Knapsack."
	     ○ Young, Roxanne K. "A Piece of My Mind: Duffle Bad Medicine."	

		JAVMA (295:13): 1491-1492. 2006
	• Lectures: o Lectures on each topic by AMOS employees	

(1) Intercultural Development	• Readings:
	    o Adiche, Chimamamanda. "The Danger of a Single Story." TED Talk
	    o Forbes, Belinda. "Cross-Cultural Adaption" and "Cultural Differences" from Accion Medica Cristiana
	 • Lectures:
	    o Lectures on each topic by AMOS employees	

(4) Burden of Disease and AMOS Interventions	• Readings:
	    o Bhutta, Zulfiqar A, Robert E. Black. "Global Maternal, Newborn, and Child Health – So Near and Yet So Far." NEJM (369:23): 2226-2235. 2013
	    o Murray, Christopher J.L. er. Al. "Measuring the Global Burden of Disease" NEJ (369:5): 448-457. 2013
	 • Lectures:
	    o Lectures on each topic by AMOS employees
	    o Global Burden of Disease by Renee Kusler, M.D., M.P.H., DTMH Medical Coordinator of Educational Programs at AMOS	

(1) (5) MDG's, SDG's, Global Economics, and Neoliberal Policies: Impact on Nicaragua	• Readings:
	   o Driscoll, David D. "The IMF and World Bank: How Do They Differ." 2016
	   o Neoliberalism Video
	   o United Nations Development Program. "Sustainable Development Goals" 2015.
	   o United Nations Development Program. "Sustainable Development Goals: List of Indicators." 2015.
	• Lectures:
	   o Lecture by Desiree Sanabria	

(1) (6) Introduction to CBPHC: History, Alma Ata, and Nicaragua	• Readings:
	   o AMOS Health and Hope. "Steps, Principles, and Activities in the AMOS CBPHC Working Model" from the 2012 Annual Report. 2013.
	   o Sidel, Victor W. "The Barefoot Doctors of the People's Republic of China." NEJM 1292-1300. 1972
	• Lectures"
	   o Lectures on each topic by AMOS employees	

(7) Social Determinants of Health	• Readings:
	   o Manchananda, Rishi. "What Makes Us Sick: Look Upstream." TED Talk
	   o Farmer, Paul. "The Upstream Doctors." 2013	

	o "The Reductive Seduction of Other People's Problems." o Video: Dr. Camara Jones "Beyond Flexner." • Lectures: o Lecture "Social Determinants of Health"	

(8) Introduction to Community Empowerment: Theory and Philosophy	• Readings:
	  o Rosato, Mikey, et. al. "Community Participation: Lessons for Maternal, Newborn, and Child Health" *Lancet* (372): 962-971. 2008
	• Lectures:
	  o Lectures on each topic by AMOS employees	

(8) Tools for Community Empowerment Part I: Identify the Problem
Tools for Community Empowerment Part II: Action Plan using asset based approaches to direct policy and interventions
	• Readings:
	  o Strack, Robert W. et. al. "Framing Photovoice Using Socio-Ecological Logic Model as a Guide." *Health Promotion Practice* (11:5): 629-636. 2010
	  o Wang, Caroline and Mary A. Burris. "Photovoice: Concept, Methodology, and Use for Participatory Needs Assessment." *Health Education and Behavior* (24:3): 369-387.
	• Lectures:
	  o Lectures on each topic by AMOS employees	

(3) Vertical vs Horizontal Public Health Interventions	• Readings: o AMOS Health and Hope. Excerpt from the 2012 Annual Report.	

	o Lawn, Joy E. et. al. "Alma Ata 30 years on: Revolutionary, Relevant, and Time to Revitalize." *Lancet* (372): 917-927. 2008 o Magussen, Lesley. Health Affairs (23): 167-176. 2004. o "What Would Jim Grant Say Now?" Lancet. 2010 • Lectures: o Lectures on each topic by AMOS employees	

(9) (10) (11) (12) (13) Health Stations Training	• Readings:
	  o AMOS Health and Hope. Health Stations Training Guide.
	  o Save the Children. "Nutrition in the First 1,000 Days" in *State of the World's Mothers 2012.*
	  o Participated in the design and implementation of a community-based field intervention in the rural community of Matagalpa in coordination with the AMOS rural health team
	• Field intervention – A health fair was held in the community with the following stations
	  o Registration: Families greeted and registered for assessment and treatment
	  o Survey: Mothers were surveyed on children's eating habits and behaviors
		• Collected data in Matagalpa via health stations.
		• Data was analyzed in the community and presented in easy to interpret charts and graphs to the community.
		• Possible intervention strategies were presented to the health committee.
		• A list of houses with children impacted by malnutrition and/or anemia was compiled and given to the health committee for targeted. monitoring and interventions
		• Data was input electronically at AMOS headquarters for use and reference.

	o Deworming: Children were provided with deworming medication by AMOS volunteers or staff members (one tablet of abendazole)	
	o Growth monitoring: Children's weight and height were recorded and are assessed for malnutrition according to growth charts or WHO's ANTHRO Plus system	
	o Anemia testing: Children's hemoglobin level was assessed by the HemoCue machine to identify those with anemia	
	o Parental Counseling and Treatment: Families received key health messages for improving the health of their children based on test results. They also received counseling regarding anemia, malnutrition, and vitamin supplementation if a prescription was given.	
	o Registration revision and Medicine Distribution: Paperwork was reviewed to ensure that each station was visited and receipt is given to mothers. The mothers of children who are to receive medicine will receive their child's prescription	

	o Educational Activities Station: Children participated in interactive activities educating them on basic health practices. o Happiness Station: Children participate in fun and creative activities such as crafts, games, or songs.	

(13) Clean Water Intervention	• Readings:
	  o AMOS Health and Hope. "Water and Basic Sanitation/Water Filter Programs Instructive for Filling the KAP survey." 1-13
	• Lectures:
	  o Lecture "Programa De Filtros De Agua" by AMOS employee Lester Lorente	

(6) Introduction to CBPR Principles and Methodology	• Readings:
	  o Minkler, Meredith, et. al. "CBPR: A Strategy for Building Healthy Communities and Promoting Health Through Policy Change." 2012
	• Lectures:
	  o Lecture by AMOS employees	

(6) (10) (11) External vs Internal Validity and the Role of Context in CBPR	• Readings: o Wallerstein, Nina and Bonnie Duran. "Community Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to Improve Health	

	Equity." *American Journal of Public Health* (100:S1): 41-46. 2010. ○ Steckler, Alan and Kenneth R. McElroy. "The Importance of External Validity." *American Journal of Public Health* (98:1). 2009 • Lectures: 　○ Lectures on each topic by AMOS employees	
(15) Cultural and Narrative Humility, Debrief, and Faith and Health	• Readings: 　○ Tervalon, Melanie and Jann Murray Garcia. "Cultural Humility Versus Cultural Competence: A Critical Distinction…" Journal of Health Care for the Poor and Underserved (9:2): 117-123. 1998. 　○ Cultural Humility Video • Lectures: 　○ Lectures on each topic by AMOS employees	
(8) MINSA and APS Panel	• Readings 　○ Lehman, Uta and David Saunders. "Community Health Workers: What Do We Know About Them? The state of evidence on programmes, activities, costs, and impact on health outcomes of using community health workers.: 2007.	
(11) Monitoring and Evaluation	• Readings: 　○ CDC. "Evaluation Guide: Writing Smart	

	Objectives. Division of Heart Disease Stroke and Prevention: 1-7. 2006 o Shanklin, David and Donna Sillian. "Census Based Impact-Oriented Methodology." 2005. o Wilder Research. "Program Theory and Logic Models": 1-19. 2009. • Lectures: o Lecture by AMOS employee	
(14) Technical Report	• A technical report was compiled utilizing the data collected and analyzed from the communities and presented to AMOS • Literature review of current WASH methods	• Technical report (entire technical report is not included in this report as it was turned into AMOS upon completion of internship) • Literature review was included in this report, as the introduction to Chapter 3
(14) Donor Report	• A donor report infographic was created to be dispersed to AMOS donors	Appendix 2
(14) Community Reports	• Data was analyzed within the community and presented back to members	Easy to interpret graphs presenting current data back to the community.

The motivation for AMOS' work is a Christian conviction that every person deserves health, and furthermore, that we must walk alongside one another, working with people, and never doing things for or to them (AMOS 2016). Their intention with the Practicum, as well as any work they do, is to do good and not harm. Time was spent discussing why some interventions fail, how global health organizations can do harm, and how we can do harm. AMOS carefully and thoroughly discussed how forces such as power, privilege, prejudice, and poverty constitute forms of violence as they cause people harm. That as an outside entity coming into a community we can strip communities, especially indigenous ones, of their own cultures and practices. Therefore the most important aspects of the Global Health Practicum emphasized by AMOS, before we were to work with any community member, were meant to deconstruct the

way one views the world and our place in it. The underlying themes present in each training module given to the interns in topics such as power and privilege, hegemony and structural violence, and critical theory were introduced and utilized to deconstruct the status quo and question society in ways it is not usually questioned. Additionally, we were lectured on social determinants of health such as biological factors, socio-economic factors, cultural factors, and environmental factors and the liberation theology, which pushes analysis in two directions:

- To seek the root causes of the problem
- To elicit the experiences and views of poor people and to incorporate these views into all observations, judgements, and actions

These modules brought the broader realization that our responsibility to each other does not stop at our own nation's borders, or with people who look, think, and act like us.

This deconstruction not only focused on broad concepts, but included self-reflection of what it means for us, as Americans, to be working in a country negatively impacted by U.S. interventions. Many US governmental policies have had negative impacts on the public health of Latin-American citizens and have led to drastic health inequalities within and between these different nations. The importance of the interns understanding that history, and the power and privilege we unknowingly carry with us, was heavily emphasized. Additionally, it was emphasized that cultural competence, such as knowing the language, history, and social norms, is not enough. That one much practice cultural humility as well, which is a practice of lifelong learning and critical self-reflection which puts each party in a mutual beneficial relations ship that attempts to diminish damaging power dynamics.

These concepts also covered how global politics, from WHO to the World Bank policies, impact and influence global health practice in low income countries. Understanding these concepts sheds light not only on the larger systems at work but how all these systems are connected. Being aware of how these organizations work and the impacts they make are incredibly important as they impact the health of nations and the work of NGOs in these countries.

Finally, AMOS took time to be self-reflective of their own organization and their place in Nicaragua, especially as a Christian organization. As the Europeans colonized Latin America, indigenous people were slaughtered and others were converted to Christianity by force. This led to many Latin Americans to view Christianity as another tool utilized by the Europeans to control the indigenous people of the New World. As a Christian organization, AMOS is acutely aware of the history of Christianity within Latin America and the implications moving forward from that history. Christianity and the topic of conversion is never brought up to the community members and AMOS members respectfully participate in any religious ceremony they are invited to while in a community.

Project # 1: One Year Impact Assessment of Water Promotor Education and Counseling in Banco de Sikia, RACCS, Nicaragua.

In July-August 2015, AMOS Health & Hope implemented a new project in the community of Banco de Sikia in RACCS. The goal of this project was to strengthen the community network and promote behavioral changes in the residents through monthly education and door-to-door counseling. A total of 6 Water Promoters (4 men and 2 women) were trained and equipped to educate their peers. Each Water Promoter was assigned 8-12 houses to visit regularly and provide education and counseling related to six water, sanitation, and hygiene themes:

1) Personal hygiene
2) House hygiene
3) Use and management of water
4) Use and management of latrines
5) Proper waste management
6) Protection of water sources and the environment

AMOS Health & Hope assessed the impact of this project through:

- KAP surveys in order to compare one year status to baseline, pre-intervention KAP survey data

- Counseling Notebooks kept by each Water Promoter and used to record the progress of each household according to each theme that was taught

- Analyzing barriers to behavior change and discovering the weaknesses and limitations of the project in order to improve it for future interventions.

Project # 2: Development of baseline data and adaptation of methodology to train Water Promoters in the community of El Bambu, RACCS, Nicaragua.

One of the most effective ways to have a positive impact on behavioral changes in community members is through intervention by regular home visitation. Therefore, in 2016, the Water and Sanitation Program is scheduled to improve the community network in La Danta through the training and equipping of at least 5 volunteer youth to work as Water Promoters. These Water Promoters will be trained to educate and counsel community members about water and sanitation issues through home visits. Following the community based primary healthcare methodology, the project will consist of:

- Obtaining baseline data for the community of El Bambu with regards to their existing water and sanitation program through KAP surveys.

- Analyzing the KAP surveys to identify key points on which to focus the training methodology for the future Water Promoters.

- Adapting and implementing the training methodology for Water Promoters in the community of El Bambu.

Product Development

Geotagging

Since RACCS is a region with some of the worst social and economic conditions in the country, the majority of homes visited were remote and far from any official roads. Consequently, there are no maps to these homes. To ensure data integrity, all homes visited in both communities were geotagged using handheld satellite GPS devices. The geotag included the name of the head of the household and the status of their water filter. By geotagging all locations where data was being collected, a map of the region can be generated that includes information about the individuals living within the region. This has the potential to facilitate the supervision and improvement of the region and to help identify the areas of greatest need (Figure 3).
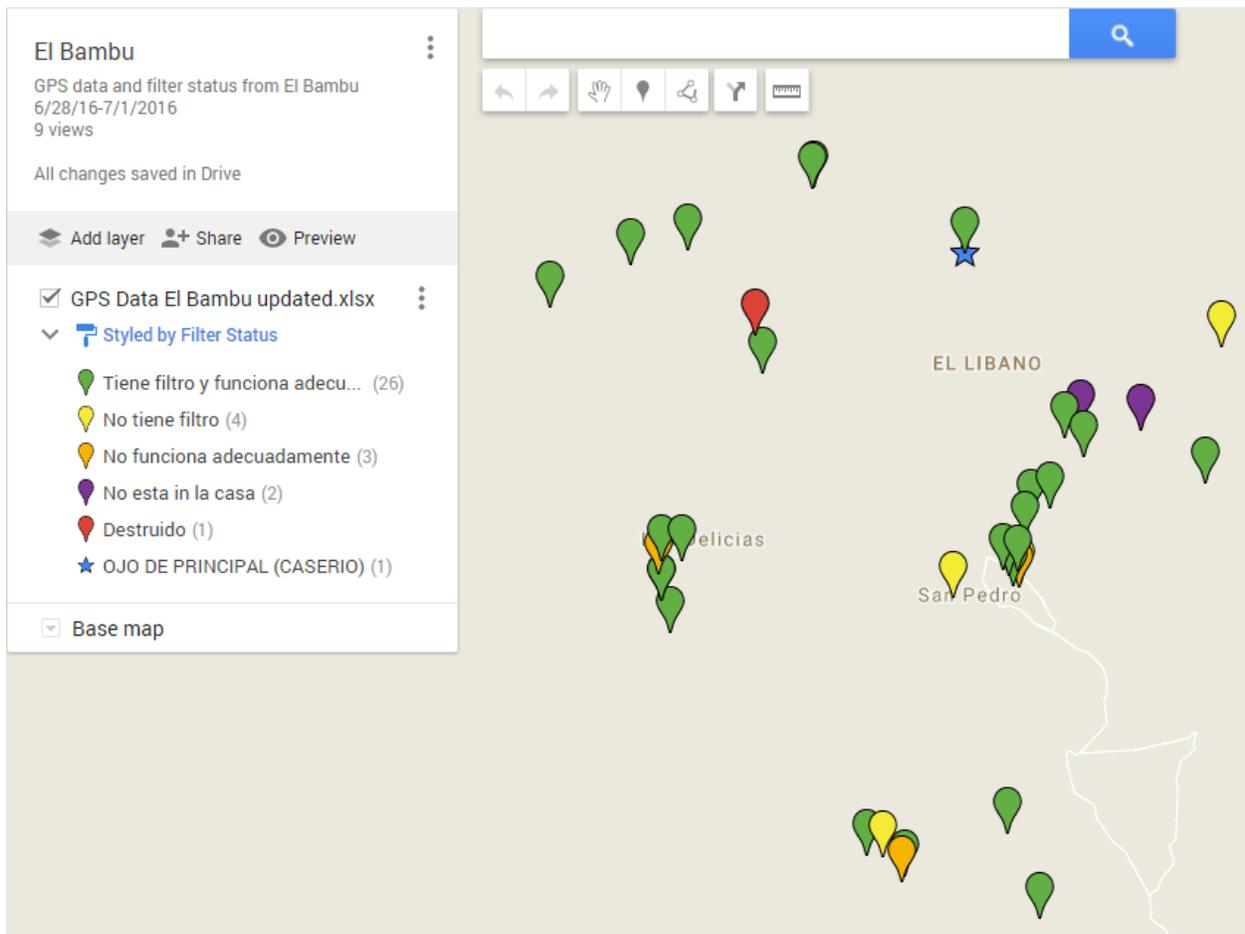

Figure 3: GPS Data and Filter Status from El Bambu

Lesson Plans

Lesson plans utilizing WASH methodology were developed for the community of El Bambu following the Care Group Training methodology (Group 2015; Force 2014). The Care Group Training was adapted by the Technical and Operational Performance Support (TOPS) Program, the Food Security and Nutrition (FSN) Network's Social and Behavioral Change (SBC) Task Force, and the CORE Group SBC Working Group. These lesson plans aim to build skills of community health workers and they were adapted by AMOS to assist in their community training session. Each lesson plan included 8 steps to engage, educate, and empower community members:

1) Lesson objectives
2) Game or song
3) Attendance, troubleshooting, and vital events
4) Behavior change promotion through pictures
5) Activity (demonstrate the behavior)
6) Discuss potential barriers and solutions
7) Practice and coach
8) Request a commitment to try out the new behavior

These lesson plans were developed and implemented on the final trip to the community of El Bambu. Training sessions included Water Promoters, Health Committee members, and other members of the community. (Appendix 6)

Chapter 3 - A Community Based Primary Health Care Approach to Water, Sanitation, and Hygiene (WASH) in Rural Nicaragua

Introduction

Water, sanitation, and hygiene (WASH) topics represent three highly-interrelated themes of great importance and concern to the international public health community. Populations that lack clean water, proper sanitation infrastructure, and proper hygiene habits suffer a much higher disease burden and their communities are negatively impacted both socio-economically and educationally (Jasper, Le, and Bartram 2012). Children, as a highly vulnerable population worldwide, generally suffer more adverse health outcomes as a result of deficient WASH education and infrastructure. Many studies have identified direct links to higher rates of infections, gastrointestinal, neuro-cognitive, and psychological illnesses where school children are exposed to inadequate water and sanitation facilities (Jasper, Le, and Bartram 2012). Public health programs and projects that incorporate key WASH topics have been adopted by international development and government health agencies as a way to improve overall health, decrease the burden of diarrheal disease, increase student learning, promote gender equality, and improve socio-economic conditions (Jasper, Le, and Bartram 2012).

Although WASH programs are now globally considered to be important in public health, the methods of implementation still vary widely, leading to a variety of program outcomes. In northern Pakistan, the Water and Sanitation Extension Programme (WASEP) project was implemented in selected villages between 1997 and 2001 (Nanan et al. 2003). The aim of the program was to improve potable water supply at village and household levels, provide education regarding sanitation facilities and proper use, and promote awareness and practices regarding general hygienic behavior. A large-scale case control study conducted from July-September 2001 found that children under the age of 5 living in villages without a WASEP project were 33% more likely to have diarrhea (Nanan et al. 2003).

A similar program, Sanitation Hygiene Education and Water Supply in Bangladesh project (SHEWA-B), commenced a WASH intervention in Bangladesh in 2007 with the collection of baseline evaluation data (Huda et al. 2012). Interim data was then collected at 6 and 18 months to identify and assess behavioral changes. In addition, researchers conducted spot checks of water and sanitation facilities and collected monthly data on diarrhea and respiratory illness from households (Huda et al. 2012). Minor changes were observed in handwashing, with participants washing their hands with soap <3% of the time around food-related events in both intervention and control households. However, they found that handwashing with soap or ash after cleaning a child's bottom increased by 63% and no access to latrines decreased from 10% to 6.8% (Huda et al. 2012). However, the authors lacked the systematic data on process indicators to identify if the communities were successfully reached by the interventions, how often, and how effectively (Huda et al. 2012).

A cluster-randomized study evaluating the impact of the Sombeza Water and Sanitation Improvement Program (SWASIP) in Coast Provence, Kenya compared baseline data collected in 2007 with follow-up data from 2013 (Schlegelmilch et al. 2016). Statistically significant improvements were found in the proportions of respondents with latrine access at home, who washed their hands after defecation, who treated their household drinking water, and the average time to collect water in the dry season (Schlegelmilch et al. 2016). However, a significant decrease was observed in the proportion of respondents who washed their hands before preparing their food, feeding their children, or after attending to a child who has defecated (Schlegelmilch et al. 2016). A knowledge-behavior gap in WASH behaviors was also identified that appeared to be tied to financial constraints, as 84% of respondents listed the affordability of soap as the primary inhibiting factor to practicing the recommended hand washing techniques (Schlegelmilch et al. 2016).

The efficacy of utilizing community health workers to implement WASH practices and effect sustainable change has been validated globally. In Haiti, a 2012 study found that community health workers were perceived as the most valuable source of health information within the department of Artibonite, Haiti (Williams et al. 2015). Community health care workers were trusted to verify water quality for communities and to provide

education about the need for clean water and improved sanitation (Williams et al. 2015). In Malawi, a 2010 study identified that positive, ongoing contacts with health care workers, especially during home visits, led women to adopt and sustain home water treatments by raising awareness of the need to treat water, encouraging the initial use of treatments, and supported continuing use (Wood, Foster, and Kols 2012).

The Water and Sanitation Program (WSP) of the World Bank Group's Water Global Practice has identified Nicaragua as one of three Latin American countries that are not on track to meet the Millennium Development Goals relating to sanitation. Nicaragua has less than 50% rural sanitation coverage (WorldBank). Within Nicaragua, there is evidence to suggest the need for WASH programs specifically targeting the North and South Caribbean Coast Autonomous Region (RACCN and RACCS, respectively). RACCN and RACCS are home to some of the worst social and economic conditions in the country, with a cross-sectional UNICEF Nicaragua study finding that WASH coverage in schools was lower in these regions compared to the more urbanized areas with higher socio-economic status (Jordanova et al. 2015). Both of these regions fundamentally lack the infrastructure and capacity to adequately implement WASH practices and ensure a lasting, positive change.

Background

In April of 2013, AMOS worked with members of the Banco de Sikia community to evaluate water quality by determining the level of contamination in the communities' main water sources. Simultaneously, members of AMOS taught community members the concepts related to water contamination. The water lab found that 90% of the community's water sources were contaminated, indicating a need for water filters in the community. In November 2013, 40 water filters were installed in Banco de Sikia and AMOS trained the beneficiaries in basic water filter use, care, and maintenance. In June 2015, the Water Promoter training was conducted and candidates were trained in the WASH methodology. The WASH program highlighted the six main themes concerning water, sanitation, and hygiene: personal hygiene, house hygiene, use and management of water, use and management of latrines, proper waste management, and protection of water sources and the environment. The main goal of this project was to strengthen the

community network and promote behavioral changes in individuals within the community. At the end of the training in July 2015, 6 Water Promoters (4 men and 2 women) pledged to be Water Promoters for their community. Each Water Promoter was assigned 8-12 houses to visit regularly and provide education and counseling regarding the six main themes of WASH.

From April 7 to April 11, 2014, an AMOS team in El Bambu began work on implementing the same approach of evaluating water supply and educating community members about water contamination concepts. The water lab revealed that 97% of the water sampled from community sources was contaminated. This indicated a clear need for water filters in the community and ceramic filters were installed in El Bambu between May 18 and May 23, 2014. A total 42 families received ceramic filters and were trained on the proper use, care, and daily maintenance. At that time, no Water Promoter training was implemented, however plans were made for baseline data collection and Water Promoter training.

Methods

Study Design and Rationale

Our study focused on two different communities within RACCS, each at a different phase of full WASH program implementation. RACCS was chosen for the pilot Water Promoter programs since it has demonstrated a clear and dire need for WASH infrastructure (Jordanova et al. 2015).

The first project assessed the one-year impact of the Water Promoter education and counseling program in the community Banco de Sikia. Impact was measured via KAP)surveys as well as water filter supervision surveys in the homes assigned to the community's Water Promoters (Appendix 3, Appendix 4, and Appendix 5). The survey data was analyzed and compared to baseline KAP data and water filter supervision surveys conducted at the inception of the program in 2015.

The second project focused on collecting baseline data and adapting methodology to train Water Promoters in the community of El Bambu. KAP surveys and water filter supervision surveys were conducted in homes assigned to the Water Promoters, so that the impact of the Water Promoters could be subsequently measured.

The data from the KAP and water filter supervision surveys were analyzed and used to customize lesson plans for the local Water Promoter training.

Data Collection

The KAP and water filter supervision surveys conducted at each home have a set of questions for ongoing program monitoring and evaluation that are asked of the inhabitants that relate to the project's program theory as outlined in the project's logic model for ongoing program monitoring and evaluation (Table 2). These questions were created to evaluate water and sanitation infrastructure, home hygiene, personal hygiene, protection of the environment, construction and use of latrines, and WASH training the inhabitants have received. The KAP survey has two final questions: one asking who trained the inhabitants, if they responded that they have received training, and one assessing the inhabitant's knowledge about how children contract parasites. The KAP survey also includes documentation of *in situ* observations of the inhabitant's handwashing technique, the cleanliness of the home's patio/yard, the status of the latrine, the adequate use of the filter and the status of the water storage containers as well as notes regarding the presence of animals in the home. KAP surveys were conducted in 53 homes in Banco de Sikia and 52 homes in El Bambu.

The water filter supervision surveys were focused on water sanitation and the proper use and maintenance of the water filter. The two communities were provided different filter types (Microfiber filter SAM-3 filters in Banco de Sikia and ceramic filters in El Bambu) resulting in different water filter surveys being administered to each community. Both surveys included general information about the state of the filter and its current use. Other common questions examined proper maintenance and proper utilization of both the filter and the recipient bucket used to store the filtered water. Additionally, both surveys assessed the quality of the filtered water, the proper use of filtered water, and the health of the inhabitants of the home. Water filter surveys were conducted in 49 homes in Banco de Sikia and 48 homes in El Bambu.

The SAM-3 water filter survey included questions specific to how often the filter was retrowashed, if the syringe was used for retrowashing, how often the syringe was washed, the condition of the syringe, and a timed test of filtration (Appendix 4).

The ceramic filter survey included questions that related to how often the filter was cleaned, how it was cleaned, how often the filter cover was cleaned, and to establish whether or not chlorine was being used on the ceramic filter (Appendix 5).

Each home visited in Banco de Sikia and El Bambu was geotagged with the name of the head of the household and the status of the water filter. That data was input into Google Maps and color coded to reflect filter status as either: functioning adequately, not functioning adequately, functioning adequately but not in use, do not have filter, or filter is destroyed. Main water sources were also geotagged and labeled in each community.

Table 2: Logic Model

LOGIC MODEL				
Resources	**Activities**	**Processes**	**Goals**	**Impact**
Economic funds: Predispositions of churches, organizations of international missions, GlobeMed at Rhodes College, and individual donors *Infrastructure:* AMOS personnel and the health committees of the rural communities *Implementation:* Delegations team	Training of the Water Promoters (PACs): - Annual training for PACs on water and sanitation in communities - Accompanying the PACs in the execution of their work in the field by delegations and APS	- # of annual trainings - # of PAC trainings - # of PAC activities	• 80% of the families that live in the communities Banco de Sikia and Nawawasito received visits (1 time per month) by the PACs	Increasing access to clean water in 80% of the 5 RACCS communities for the year 2017 Healthier communities with low rates of diseases related to the consumption of contaminated water 20,000 people dewormed per year (organizational impact)
	- Equipment for PACs - Delivery of hygiene kits and training to families	- # of PAC's with equipment - # of kits delivered to the families		
	Make home visits to families in rural communities to provide counseling on issues of water, sanitation, and hygiene in the following topics: 1. Personal hygiene 2. Household Hygiene 3. Usage and Management of Water 4. Usage and Management of Sanitation 5. Waste Management 6. Protection of Water Sources	- # of families visited - # of families active in the project - # of home visits made by each PAC to their assigned families	• 80% of the houses checked had an adequate place to wash their hands (with soap, water and a towel or rag for drying) • 50% of the houses had gates in the main entrance and in the kitchen to block the access of animals to the inside of the house • 80% of the houses provide proper maintenance to latrines, i.e. kept clean inside • 80% of the families properly remove the waste generated in their homes	
	Installation of filters in homes in rural communities	-Number of filters installed -Number of filters in good state -Number of destroyed filters	• 80% of the families that live in the communities of Banco de Sikia and Nawawasito have a water filter or practice some method to improve the quality of water used for drinking and preparing food • 95% of the water analyzed showed reduction of contamination with E. coli with the use of the filter • Reduction of up to 80% of recontamination of filtered water stored in recipients	
	Monitoring and supervision of the project	Supervision of the work of the PACs	• Having the information necessary to bring the project to the community	

Statistical Analysis

For Banco de Sikia, behavioral changes that were of particular interest as listed in the project's logic model (Table 2) were analyzed first by calculating the percentage of each response to questions on both the KAP and water filter supervision surveys. The 2016 data was then compared against 2015 baseline using a two-sided t-test to measure for statistically significant differences.

For El Bambu, baseline data was created by calculating the percentage of each response to the questions of interest as listed on the logic model (Table 2).

Results and Discussion

Logic Model Outcomes for Project # 1: Impact Assessment of Water Promotor Counseling in Banco de Sikia (El Ayote - RACCS)

Analyzing the data collected from Banco de Sikia and comparing it against the logic model simultaneously identified program strengths and weaknesses.

An important aspect to any community-based healthcare approach is validating that community members both providing and receiving information are fully aware of what is happening. To this end, houses were surveyed both pre- and post-intervention in an attempt to ensure household members were aware of the training they were receiving. In 2016, 77% of households reported receiving talks in their homes by either Health Promoters or Water Promoters, or both.

As with any survey, results for this question could be skewed due to an incomplete understanding of the question or recall bias. It is not clear if visited households fully understood the difference between the Water Promoters and Health Promoters and, if they did, that they recalled correctly which had visited when later surveyed by AMOS. While the primary focus of Health Promoters is not solely on WASH, it is an integral part of many other aspects of their focus and many attend trainings for the Water Promoters. Due to these potential ambiguities, responses where households reported receiving talks from either a Water Promoter or Health Promoter were grouped into "Community Health Worker". This was done since it is possible that many households received WASH training by Health Promoters. Regardless, the results still suggest that the program was successful in terms of households that were reached and trained by community members who are volunteer health workers for AMOS (Figure 4).
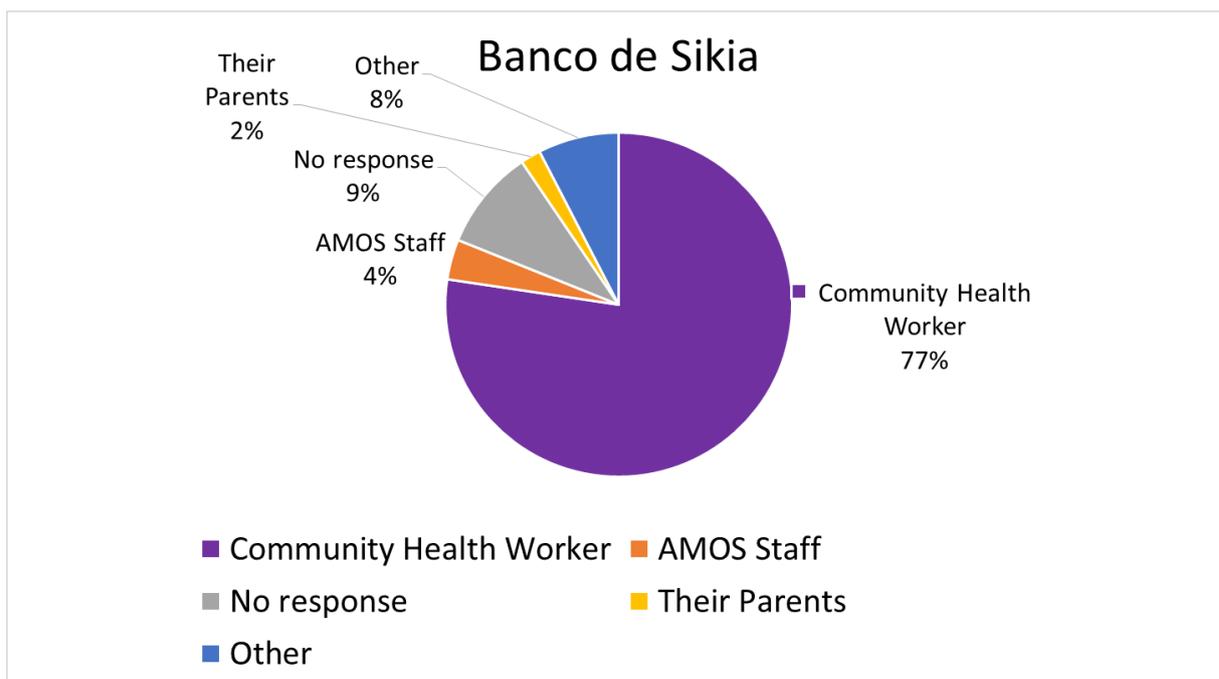
Figure 4: Households Covered by Community Health Worker

A major component of fully implementing WASH into a rural community is ensuring that community members understand the importance and have access to an adequate location for handwashing that includes soap, water, and a towel for drying. In the 2015 baseline data for Banco de Sikia, 89% of households reported having an adequate place to wash their hands. Unfortunately, that percentage fell to 73% of households when the same question was asked in 2016. This change was not statistically significant, however it did drop below the logic model goal. While at the time there was no further investigation into root causes for this reduction of reported hand washing stations, it's possible that common issues such as knowledge behavior gaps played a role. Knowledge behavior gaps are instances where a subject "knows" what methods should be utilized to improve their health, however there are barriers to achieving the behavior change necessary. These barriers include but are not limited to financial, cultural, religious, and social issues.

Ensuring that proper technique is utilized when washing hands is enormously important to measuring the successful introduction of WASH concepts. To evaluate technique, a handwashing exercise was included in the KAP survey that asked each interviewee to wash their hands while being observed. The surveyor then marked whether the interviewee correctly followed each of five important steps of proper handwashing including: wetting both hands with clean water; lathering both hands; rubbing palms, back

of hands, between fingers and nails three times; rinsing hands with clean water; drying hands with a clean towel or shaking to air dry.

If every step was performed properly, the surveyor marked a "Yes", and if any of the requirements were not met a "No" was marked. In the cases that all five steps were not performed, or not performed properly, the surveyor marked which step was improperly performed/not performed properly to be utilized later when guiding training. This exercise saw a statistically insignificant 13% decrease of interviewees who followed all five steps properly from 2015-2016. While fully exploring these barriers was beyond the scope of the intern's project, these changes could be related to the decrease in people who reported having an adequate location to wash their hands. Both of these reductions in positive behaviors could serve as a focus for behavior change for future projects (Figure 5).
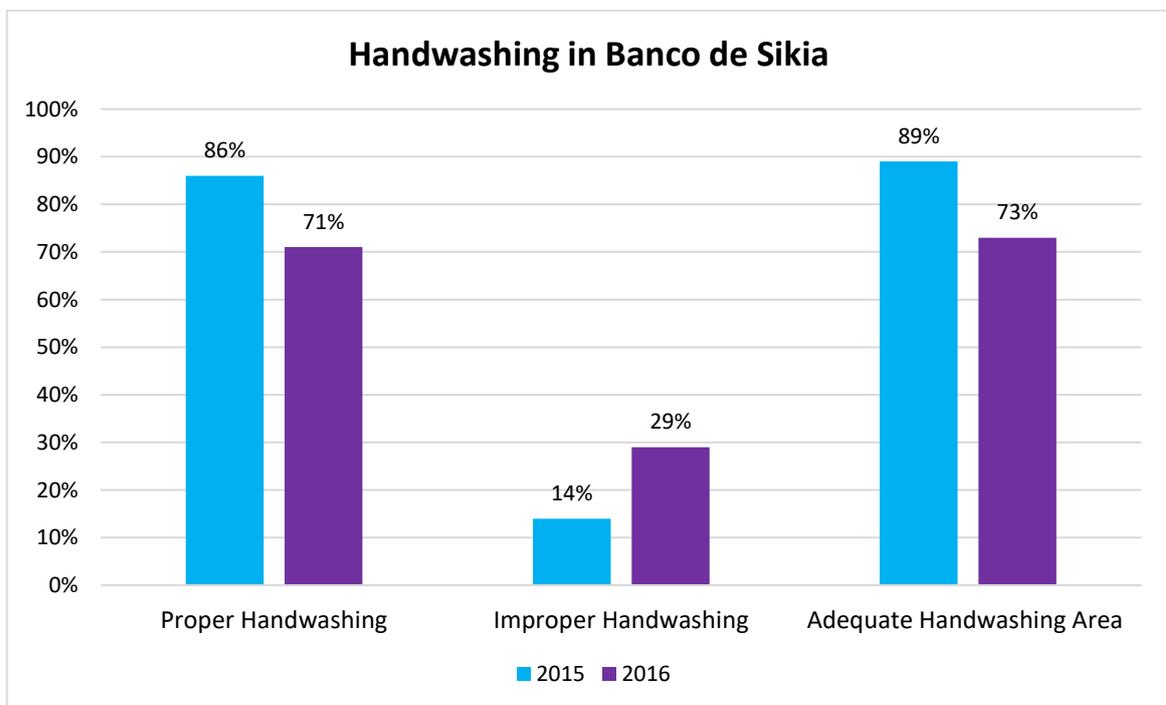
Figure 5: Handwashing in Banco de Sikia

Proper elimination of trash is important for the overall health of the family and the wider community's environment. For example, at the time of this study in 2016, the Zika outbreak was reaching its peak. Improper elimination of trash leads to its accumulation around homes and creates a breeding ground for mosquitoes, a Zika vector. This issue of proper elimination of trash was another to fail to reach the logic model goal. Interviewee's

responses to how they eliminate their garbage revealed a 40% increase in homes that were improperly disposing of their garbage by "throwing it in any empty space". Although this change was not statistically significant, the results were an indication that more attention needs to be paid to the issue of trash in the yard. Additionally, the observational KAP question of whether or not garbage was found piled in the patio or yard found a statistically significant change in the number of households with garbage present in their yard. When compared to baseline there was a 81% increase in homes with garbage in their yard (Figure 6).
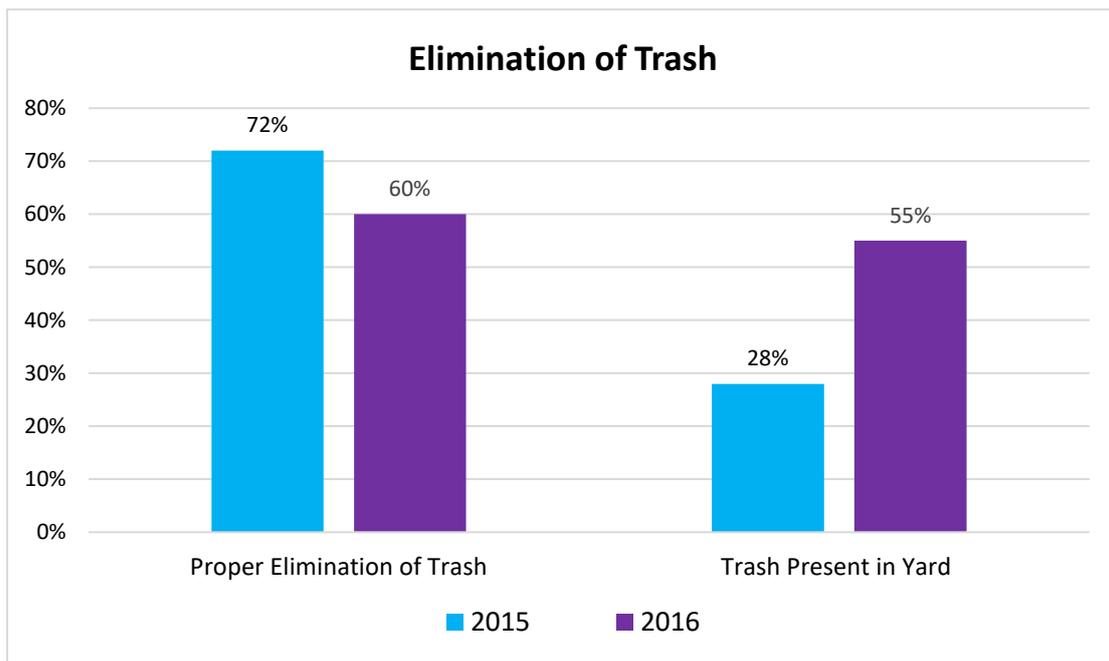
Figure 6: Elimination of Trash

Improvements were seen in other areas of the logic model focus. One such area is the number of houses with gates in both the entrance and kitchen in their homes. Gates are extremely important in these community households because culturally they leave all doors open for ventilation, which allows wild and domesticated animals to walk through their homes, increasing the risk of family members contracting a zoonotic disease. A 31% increase was seen in the percent of houses that had gates in the main entrance and in the kitchen to block the access of animals to the inside of the house when comparing against 2015 data, however the change was not statistically significant. Additionally, the total percentage of households that had gates in both areas of their home was only 49%, falling just short of the 50% goal outlined by the logic model (Figure 7).

Other improvements seen were the number of households with clean latrines. The cleanliness of the latrines was another way to evaluate the overall hygiene of the family as well as decreasing sources of disease. The survey revealed a 15% increase in households with clean latrines from 2015-2016. Although this change was not statistically significant, the total percentage of households with clean latrines surpassed the logic model goal, with 84% of households meeting this goal (Figure 7).
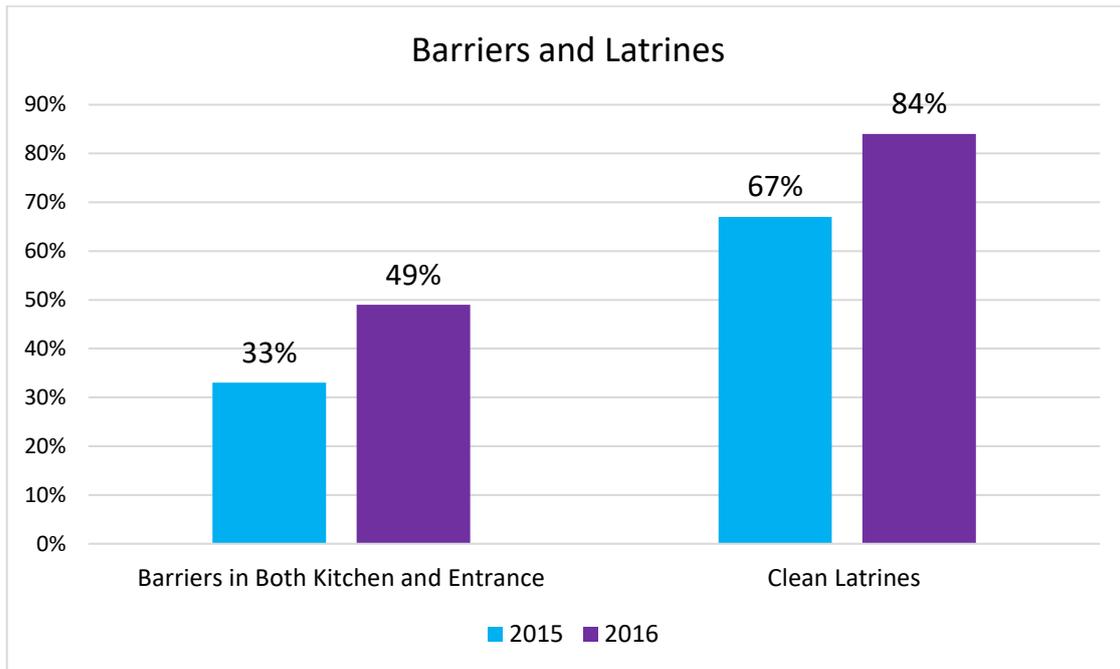

Figure 7: Barriers and Latrine Status

One of the main focus points of this project was that at least 80% of the families that live in the communities of Banco de Sikia have a water filter or practice some method to improve the quality of water used for drinking and preparing food. The comparison to baseline found a statistically significant change (p-value <0.001) in the percentage of households using any method of disinfecting their water. Eighty-eight percent of households used some form of disinfection in 2016, up from 50% of households in 2015. Specifically, there was a 76% increase in households that utilize filtration as their primary form of disinfection. The changes in each category of approved methods of disinfection are outlined in Table 3.

Table 3: Methods of Water Disinfection in Banco de Sikia

Method of Disinfection	Percent Change from 2015	Overall p-value
Chlorine	75% decrease in use from 2015	<0.001
Filter	76% increase in use from 2015	
Sedimentation	2% increase in use from 2015	
No Method Used	78% decrease from 2015	

However, there was still problem within the community with proper maintenance of their water filters. For adequate use, the SAM III filters require that they be used daily, that at least 20 liters of water be poured into it at least 2 times per day by using a colander (strainer), that chlorine never be used to clean the filter, and that the water the family drinks is from the filter. All of these requirements had to be reported by the interviewee for the household to be considered to be using the filter adequately. In 2015, only 28% used the filter adequately and in 2016 only 36% of households used the filter adequately. Although improvement was seen, adequate use of the filter is an area that still needed extra focus. The program did see success in a related logic model goal, reduction by up to 80% of the recontamination of filtered water stored in recipient buckets. The KAP survey contained 6 observational questions related to cleanliness of the recipient bucket including: the strainer is in good condition, the syringe used for cleaning the SAM III filter is in good condition, the recipient bucket has a lid, the recipient bucket is clean, the bucket's faucet (key) is clean, and the filter hose is clean. These observational questions found a 62% increase in households practicing techniques to reduce contamination of the

recipient bucket by following these measures, surpassing the logic model goal of 80% (Figure 8).

**Adequate use of Filters and Recipients**
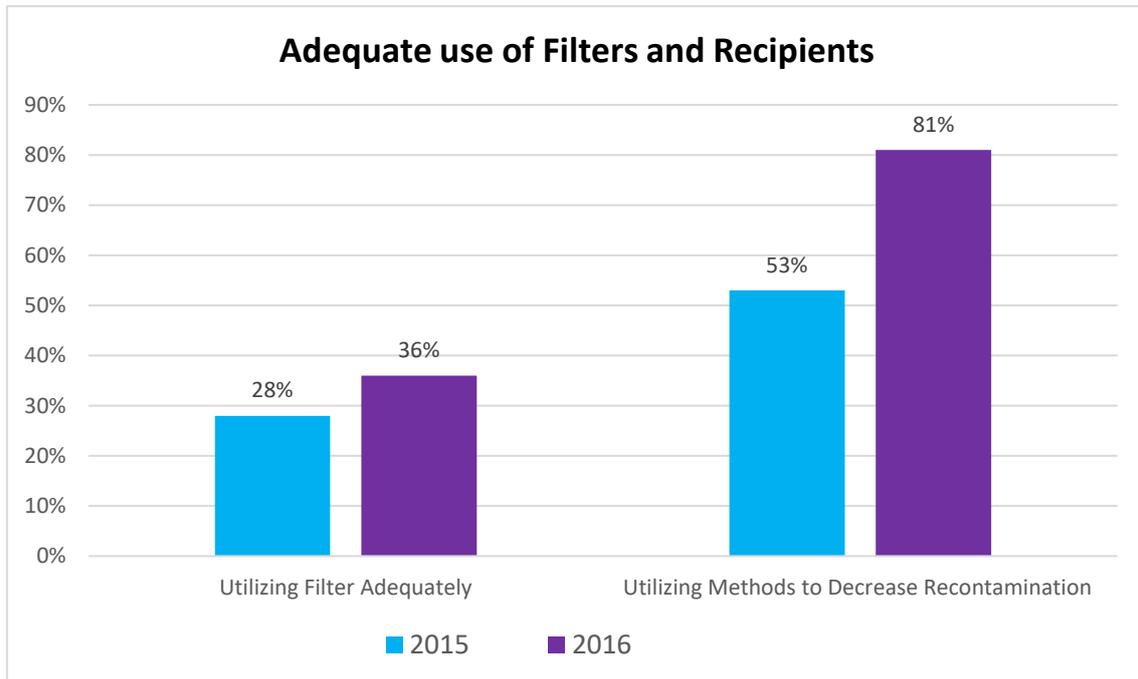
Figure 8: Adequate use of Filters and Recipients

Finally, all of the survey data was analyzed and reported back to the community, which included a participatory discussion. This discussion also helped the community identify where the program was successful and where work still had to be done. This process helped fulfill the logic model goal of having the information necessary to bring the project to the community and keep them actively involved in monitoring and evaluation of the program.

The logic model goal of 95% of the water analyzed showed reduction of contamination with *E. coli* as a measure of coliform contamination with the use of the filter was not evaluated by the Global Health Practicum interns, thus was beyond the scope of the internship project.

Logic Model Outcomes for Project # 2: Development of baseline and adaptation of methodology for the training of Water Health Promoters in the community of El Bambu (El Ayote – RACCS)

With assistance from members of the local health committee, KAP, and Ceramic Filter surveys were administered in 52 homes in El Bambu to establish baseline data.

The data suggests that El Bambu has met two of the logic models established outcomes without intervention: 94% of households surveyed had an adequate place to wash their hands and 80% of households surveyed reported that filtration is their primary method of disinfection. However, only 44% of the households maintain their filters correctly and only 31% maintain their recipient bucket correctly. Furthermore, only 17% of houses had gates protecting the entrance to both their kitchen and their main room and only 71% of households maintained their latrines correctly. A total of 67% of households surveyed reported that they employed an approved trash disposal method (burning it, depositing it in an authorized area, burying it, or organic composting). In contrast, 50% were observed to have trash in their yards, once again revealing the importance of the observational survey data.

This data was complied, analyzed, and presented back to the community. Lesson plans were developed for WASH training, which focused on areas in which El Bambu was deficient. After learning 12 modules on WASH themes, six youth in el Bambu volunteered as Water Promoter candidates.

Conclusions

Programs designed around WASH topics have been adopted by numerous international development and government health agencies as a way to improve overall health in areas with poor WASH infrastructure. AMOS aimed to build upon these existing programs and adapt them to fit the unique needs of Nicaragua's most vulnerable rural populations. The Water Promoter program is meant to add to the community based primary health care model to maintain direct communication with families through home visits and to add an individualized approach to implementing WASH within the community. The purpose of the one-year interim evaluation of the pilot project in Banco de Sikia was to evaluate the effectiveness of the Water Promoter program, as well as determine the future of the program. We found the program to be highly successful in both reaching a majority of the rural community members and making healthy WASH behavior changes within the community. We anticipate this novel approach of implementing WASH training using community-based, primary health care principles to be an effective and valuable method of delivering WASH topics to the most affected areas around the world. To effectively gauge long-term impact, progress in WASH practice adoption should continue to be evaluated in these communities.

MPH Foundational Competencies

The Global Health Practicum and internship incorporated a multitude of the MPH foundational competencies. The competencies and corresponding reference numbers can be located in Appendix 7.

The Practicum began with a Nicaraguan cultural and historical orientation. This orientation included both cultural and historical perspective of the Nicaraguan people, as well as describing what it means for Americans to come into a community affected by U.S. interventions in Latin America. Many US governmental policies have had negative impacts on the public health of Latin-American citizens and have led to drastic health inequalities within and between these different nations (15, 8). This orientation also broadened that scope to how global politics impact and influence global health practice in low income countries (5, 6, 8).

An array of topics such as power and privilege, hegemony and structural violence, and critical theory were introduced and utilized to deconstruct the status quo and question society in ways it is not usually questioned. Additionally, we were lectured on social determinants of health such as biological factors, socio-economic factors, cultural factors, and environmental factors and the liberation theology, which pushes analysis in two directions:

1. To seek the root causes of the problem
2. To elicit the experiences and views of poor people and to incorporate these views into all observations, judgements, and actions

These topics helped deconstruct the way one views the world and our place in it. They brought the broader realization that our responsibility to each other does not stop at our own nation's borders (6).

The CBPHC process includes assessing the community's needs, assets, and capacities prior to initiating any programs. The Global Health Practicum dove into detail about the unique needs, strengths, and weakness of the rural communities of Nicaragua (7).

The data collected in Banco de Sikia was analyzed and interpreted to be utilized not only for program validation and thus continued funding, but also by the global health community as WASH is implemented across the world (4). Additionally, as part of the CBPHC process of presenting the data to the community, the data collected in both Banco de Sikia and El Bambu was revised to be presented to a low literacy audience (19). This

also gave us an opportunity to have an active conversation with the community, addressing where the program is succeeding and where it is falling short, and help guide plans for changes to make in the future (16, 17).

Finally, interns were immersed in an environment where collaboration between interprofessional teams was a necessity. Since intern teams focused on different aspects of the project, it was vital that teams worked extensively together as well as with people from every department of AMOS, members of the community health committees, community health workers, and individual water promoters (21).

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Appendix

Appendix 1: AMOS Community Based Primary Health Care Model

AMOS HEALTH AND HOPE
HOW W A S H
### IS SAVING LIVES IN RURAL NICARAGUA

The Water, Sanitation, and Hygiene (WASH) Program works with local leaders to continually educate their communities about the use and maintenance of water filters well as themes such as personal hygiene and sanitation.

LACK OF ACCESS TO CLEAN WATER

20%

In the rural communities where AMOS works, **less than 20% of families have access to safe drinking water.**

FILTERS PROVIDE CLEAN WATER

MATAGALPA
319 filters in
5 communities

CHINANDEGA
285 filters in
4 communities

Total Filters: 1,320

319

285

353

363

AMOS Filters
installed as of
July 2016

RACCS
363 filters in
5 communitie

BOACO
353 filters in
7 communities

HEATLH IMPROVEMENTS

98%
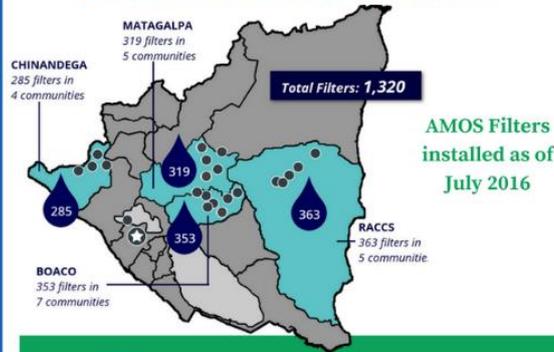
In Banco de Sikia, **98% of families** surveyed in 2016 reported that their overall health has improved since having a water filter.

(ex. less diarrhea, fewer stomach aches)

MORE THAN A FILTER

Water Promoters are trained local leaders that help further educate families in their own communities.

28%

After a year of having Water Promoters, **28% more families** in Banco de Sikia practice proper management and use of water.

YOU CAN MAKE A DIFFERENCE!

Learn more about how you can participate in the AMOS WASH Project in 2017!

VISIT US AT WWW.AMOSHEALTH.ORG OR LIKE US ON FACEBOOK

Appendix 2: Donor Report

AGUA Y SANEAMIENTO BÁSICO / PROYECTO DE FILTROS DE AGUA

FORMATO DE APERTURA (FAPFA#2)

ENCUESTA C.A.P SOBRE AGUA, SANEAMIENTO E HIGIENE EN EL HOGAR

SECCIÓN # 1: GENERALES / GENERAL		
Nombre del Encuestador / *Name of the survey*:	☐ Staff AMOS (1)	☐ Delegaciones (2)
	☐ Voluntarios (3)	☐ Comunitarios (4)
Encuesta # / *Survey #*:	Fecha de Encuesta / *Survey date*:	Casa # / *House#*:
Depto/*Region*: Municipio / *Municipality*:	Comunidad / *Community*:	
Nombre del Entrevistado / *Name of the interviewee*:	Edad / *Age*:	Genero / *Gender*: M (1) ☐ F (2) ☐
Roll del entrevistado / *Roll of the interviewee* Jefe/Husband (1)☐ Esposa/Wife (2)☐ Hijo/Son-Daughter (3)☐ Otro/Other (4) ☐	Cantidad de Personas / *Quant. of people*:	
Nombre del Jefe de la Casa / *Name of head of the house*:	Cantidad de NN < 5a / *# Children < 5 years*:	

SECCIÓN # 2: AGUA Y SANEAMIENTO / WATER AND SANITATION				
1	¿De donde viene el agua que utilizan para beber y preparar o cocinar los alimentos en el hogar? *Where does the water that you use at home for drinking and cooking come from?*		☐Pozo con tuberia hasta la casa (1)	From well to pipe in the home
			☐Pozo con tuberia hasta el patio (2)	From well to pipe outside the home
			☐Pozo excavado protegido (3)	A protected well
			☐Pozo excavado sin protecc. (4)	An unprotected well
			☐Quebrada, rio, estanque (5)	Creek, river or pond
			☐Ojo de agua (6)	Spring water
			☐Agua de lluvia (7)	Rain water
			☐Pozo comunal (8)	A communal well
			☐Ojo de agua con manguera hasta la casa (9)	From spring water to hose in the home
			☐Ojo de agua con manguera hasta el patio (10)	From spring water to hose outside the home
			☐Otro: _____ (11)	Other
2	¿La fuente que le da (abastece) agua para su casa es privada o comunitaria? Who owns the well in the community		☐Comunitaria/Pública (1)	Public
			☐Privada pero comparte (2)	Private but shared w/commu.
			☐Privada y no comparte (3)	Private and not shared w/commu.
			☐Otro: _____ (4)	Other
3	¿Se paga el servicio de agua? *Do you pay for water service?*	Si respuesta es NO, pasar a Preg # 5. *If the answer is NO , move to question # 5*	☐Si (1) ☐No (2) ☐No Sabe o No Responde (3)	Yes No Do not know / No Answer
4	En caso de responder SI... ¿Cuánto paga? *If Yes... How much?* *If NOT.... Next questions.*		C$ _____ cordobas por mes *(per month)*	
5	¿Todo el año tienen agua en su casa? Do you have access to water throughtout the year?	Si respuesta es NO, preguntar en que época tienen agua (invierno o verano) *If the answer is NO , ask in what season they have water (winter or summer)*	☐Si, todo el año (1) ☐Solo en invierno (2) ☐Solo en verano (3) ☐Otro: _____ (4)	Yes, all the year Only in winter Only in summer Other
6	¿Que olor tiene el agua de beber? *How does the drinking water smell?*		☐Bueno (1) ☐Feo (2) ☐Normal (3) ☐Otro: _____ (4)	Good Not good Normal Other
7	¿Que color tiene el agua de beber? *What is the color of the water?*		☐Clara / Transparente / Blanca (1) ☐Turbia / Oscura (2) ☐Otro: _____ (3)	Clear/Transparent/white Cloudy Other

#				
8	¿Qué sabor tiene el agua de beber? / *What is the flavor of the water?*		□Bueno (1) □Malo (2) □Normal (3) □Otro: _____ (4)	Good No good Normal Other
9	¿Diariamente cuánto tiempo le toma ir a traer agua a la fuente? (ida/vuelta) / *How long does it take you to get to the water source? (round trip)*	Si hay agua dentro de la casa (cocina) marcar NO APLICA *If they have water inside the house (kitchen) mark NOT APPLY*	□Minutos_____ □No Aplica □ No sabe / No Responde	Minutes Not apply Do not know / No Answer
10	Generalmente: ¿Quién va a traer agua para la casa? *Who usually goes to this source to collect water for the household?*		□Mujer(es) adulta(s) > 15 años (1) □Hombre(s) adulto(s) > 15 años (2) □Mujer(es) + niños < 15años (3) □Hombre(s) + niños < 15años (4) □Persona que no es del hogar (5) □No aplica (6)	Woman/women > 15 yrs old Man/men > 15 yrs old Women/woman and children(s) Man/men and children(s) Persons outside of immediate family Not apply
11	¿Guarda usted agua en la casa? *Do you keep water in your house?*	Si respuesta es NO.... Pasar a Preg # 14 *If the answer is NO, move to question # 14*	□Si (1) □No (2)	Yes No
12	¿Para qué utilizan el agua que guardan en la casa? (SELECCIÓN MÚLTIPLE) *For what do you use the water kept at home? (MULTIPLE CHOICE)*		□Beber (1) □Cocinar (2) □Lavar los trastes (3) □Lavar ropa (4) □Bañarse (5) □Otras: _____ (6)	Drinking Cooking Washing the dishes Washing clothes Showers Other
13	¿En qué trastes (utencilios) guarda el agua que utiliza solo para BEBER Y PREPARAR O COCINAR LOS ALIMENTOS? (SELECCIÓN MÚLTIPLE) *In what utensils do you store your drinnking water (MULTIPLE CHOICE)*		□Balde/bidón plástico (1) □Tinajas/ollas (2) □Barril de plástico o tanque (3) □Filtro (4) □Galones/botellas plást. (5) □Otras: _____ (6)	Plastic bucket Jars Plastic barrel/tank Filters Water gallon/plastic gallons Other
14	¿Haces algo para desinfectar el agua que usas para beber? *Do you treat your water with what?*	Si la respuesta es SI, preguntar que método usa para tratar el agua? *If they answer YES, ask what methods they use to treat the water?*	□Clorar (1) □Sedimentar/la dejo reposar (2) □Hervir (3) □Filtrar (4) □Sodis (5) □La cuelo a través de tela (6) □No / Ninguna: (7) □Otro: _____ (8)	Chlorine Sedimentation / let it rest Boiling Filtrations Solar Straining (through cloth) Not / None Other
SECCIÓN #3: HIGIENE EN LA CASA / HYGIENE IN THE HOME				
15	¿Tiene baño en la casa? *Do you have a bathroom in the home?*		□Si (1) □No (2)	Yes No
16	¿Cómo eliminan la mayor parte de la basura de la casa? *How do you dispose of most garbage in your home?*		□La depositan en basurero autorizado (1) □La queman en el patio (2) □La queman en un lugar designado (3) □La entierran (4) □La tiran en predio baldío: hoyo, cause, ca (5) □La tiran en el río, laguna, quebrada... (6) □Pagan para que la boten (7) □Hacen abono orgánico (8) □Otro _____ (9)	Dispose of it in official garbage Burn it in the yard Burn it in assigned location Bury it Throw it in any open space Throw it in the river, lake, stream Pay someone to dispose of it Organic composting Other

17	¿Tiene una cocina? (un lugar o espacio sólo para cocinar) *Do you have a kitchen? (or a place set aside just for cooking)*		☐Si (1)	*Yes*
			☐No (2)	*No*
18	¿La cocina tiene ventanas o aberturas que permitan la ventilación (el paso del aire/viento por la cocina) *Does the kitchen have windows or openings for ventilation?*	Si preg#17 es NO... marcar opción 3 *If the question #17 is NO, mark option 3*	☐Si (1)	*Yes*
			☐No (2)	*No*
			☐No aplica (3)	*Not apply*
19	¿Cuándo cocinan, el humo se pasa a los otros cuartos (sala, dormitorios, etc) de la casa, exponiendo a las personas de la casa al humo? *Are people exposed to kitchen smoke when in other parts of home?*		☐Si (1)	*Yes*
			☐No (2)	*No*
			☐No aplica (3)	*Not apply*
20	¿Qué tipo de cocina tienen en la casa? (Si hay más de una cocina en la casa, se debe preguntar por la que usan más frecuente) *What type of oven do you have?* *(If there is more than one stove in the house, we should ask for the one they usually use)*		☐Gas bútano (1)	*Gas tank*
			☐Gas - Kerosene (2)	*Kerosene*
			☐Eléctrica (3)	*Electricity*
			☐De leña (4)	*Fire wood*
			☐De carbón (5)	*Charcoal*
			☐Ecológica - ecofogón (6)	*Enviromental friendly*
			☐Otro _____ (7)	*Other*
21	¿Tiene letrina o inodoro en la casa? *Does the house have a latrine or toilet?* Si la respuesta es "letrina prestada", ubicarlo en la opción OTROS. / *If the answer is a latrine provided, it must be marked in the option OTHER.*	Si respuesta es NO.... Pasar a Preg # 24 *If the answer is NO, move to question # 24*	☐Si, latrine (1)	*Yes, I have a latrine*
			☐Si, inodoro (2)	*Yes, I have a toilet*
			☐No (3)	*No*
			☐Otro: _____ (4)	*Other*
22	¿Utilizan la letrina o inodoro para hacer sus necesidades? *Do you use the latrine or toilet to relieve yourselves?*		☐Si (1)	*Yes*
			☐No, porque esta llena (2)	*Not, because it is full*
			☐No, nos gusta (mal olor) (3)	*No, we don't like it (bad smell)*
			☐No responde (4)	*No answer*
23	¿La letrina o inodoro tiene banco para adultos y para niños/as? *Does the latrine or toilet have a bench for both adults and children?*		☐Ambos (1)	*Both*
			☐Solo para adultos (2)	*Only adult*
			☐No hay niños (3)	*There are not childrens*
			☐No Sabe o No Responde (4)	*Do not know / No Answer*
24	¿Donde hacen sus necesidades los niños menores a 3 años? (SI NO HAY NIÑOS MENORES DE 3 AÑOS MARCAR "NO APLICA") *Where do children under 3 years old go to the bathroom?* *(ONLY IF THERE ARE CHILDREN < 3, MARK "NOT APPLY")*		☐En letrina (1)	*In latrine*
			☐Dentro de la casa (2)	*Inside in the house*
			☐En bacinilla (3)	*In a chamber pot*
			☐Al aire libre (patio) (4)	*Outdoors*
			☐En la ropa (5)	*Diapers*
			☐No Aplica (6)	*Not Apply*
			☐Otros (7)	*Other*
25	¿Cuándo se llena la letrina que hace la familia? *What does your family do when the latrine gets full?*	Si es una casa nueva y no han cambiado la letrina; hacer la pregunta en pasado *If it is a new home and have not changed the latrine; ask the question last*	☐La abandona y construyen una nueva/ *Abandon it & build a new one* (1)	
			☐La atierran y construyen otra/ *Fill it with dirt and build a new one* (2)	
			☐La abandona y defecan al aire libre/ *Abandon it & defecate outside* (3)	
			☐La atierran. Defecan al aire libre/ *Fill it with dirt & defecate outside* (4)	
			☐No Aplica - / *Not Apply* (4) --- mark if the answer is toilet	

			SECCIÓN #4: ASEO / CLEANLINESS	

26	Generalmente, ¿Usted en qué momentos se lava las manos? (SELECCIÓN MÚLTIPLE) *Generally, how often do you wash your hands (MULTIPLE CHOICE)*		☐Antes de comer (1) ☐Antes de cocinar (2) ☐Despues de labor en campo (3) ☐Despues de usar la letrina (4) ☐Despues de tocar animales (5) ☐Casi nunca/nunca (6) ☐Otro: _____ (6)	*Before eating* *Before cooking* *After field work* *After using the latrine* *After touching animals* *Almost never/never (6)* *Other*
21	¿Usa jabón, ace o cenizas para lavarse las manos? *Do you use soap/detergent for hand washing? What about ashes?*		☐Jabón (1) ☐Ace o detergente (2) ☐Uso de cenizas (3) ☐Ninguno (4) ☐No Sabe o No Responde (5)	*Soap* *Detergent* *Wash hands with ashes* *None* *Do not know / No Answer*
28	¿Hay un lugar especifico donde se lavan las manos? *Where do inhabitants wash their hands?*	Si la respuesta es SI, preguntar si es dentro o fuera de la casa *If they answer YES, ask if it is inside or outside the house*	☐Si, dentro de la cocina (1) ☐Si, en algún lugar del patio (2) ☐No, no hay lugar especifico (3)	*Inside the kitchen* *On the patio* *Nowhere specific*

		SECCIÓN #5: OTROS / OTHERS		

29	¿En los últimos 6 meses (previo a la encuesta) han sembrado árboles en la propiedad (terreno donde esta construida su casa)? *Do you practice reforestation in your property? (the land where the house is built)*	Si respuesta es NO.... Pasar a Preg # 31 *If the answer is NO, move to question # 31*	☐Si (1) *Yes*	☐No (2) *Not*	☐No sabe (3) *Do not know*
30	Que tipo de abono usa para sembrar árboles en su propiedad? *What type of composting do you use to plant a tree in your property?*		☐Casero (1) *Home*	☐Comercial (2) *Commercial*	☐Ninguno (3) *None* ☐No sabe (4) *Do not know*
31	Alguna persona de la casa conoce (sabe) como elaborar abono orgánico casero? *Does anyone in the house (or community) know how to make organic compost/fertilizer?*		☐Si (1) *Yes*	☐No (2) *Not*	☐No sabe (3) *Do not know*

	Ha participado en charlas (pueden ser formales o informales) sobre alguno de los siguientes temas *Have you participated in formal or informal training sessions regarding any of the following themes?*			
32	Uso y manejo de agua (agua para beber) *The use and management of drinking water*	☐Si / Yes (1)	☐No (2)	☐No sabe / Do not know (3)
33	Importancia y forma adecuada de lavarse las manos... *The importance and knowledge of proper hand washing*	☐Si / Yes (1)	☐No (2)	☐No sabe / Do not know (3)
34	Uso y mantenimiento de letrinas.... *The use and maintenance of latrines*	☐Si / Yes (1)	☐No (2)	☐No sabe / Do not know (3)
35	Manejo adecuado de la basura (orgánica e inorganica) *The proper handling lthe garbage (organic and inorganic)*	☐Si / Yes (1)	☐No (2)	☐No sabe / Do not know (3)
36	Importancia de la limpieza en la casa *Importance and maintenance of a clean house*	☐Si / Yes (1)	☐No (2)	☐No sabe / Do not know (3)
37	Métodos para desinfectar el agua... *Methods of disinfecting water*	☐Si / Yes (1)	☐No (2)	☐No sabe / Do not know (3)
38	Uso adecuado de recipientes para guardar agua... *The proper use of water storage containers*	☐Si / Yes (1)	☐No (2)	☐No sabe / Do not know (3)
39	Protección de fuentes de agua (medio ambiente) *On environmental sustainability (wrt water)*	☐Si / Yes (1)	☐No (2)	☐No sabe / Do not know (3)

40	¿Quién le brindo la charlas sobre los temas anteriores? *Who gave him the talks on the above topics?*	☐La profesora o maestra (1) ☐Personal del MINSA (2) ☐El promotor de salud (AMOS) (3) ☐Miembros del CSL (4) ☐El promotor de agua (AMOS) (5) ☐Mis padres (6) ☐Nadie (7) ☐Otros _____ (8)	*The teacher* *MINSA Staff* *The health promoter* *CSL Staff* *The water promoter* *My parents* *Anyone* *Other*
41	En su opinión: ¿Cuáles cree usted que pueden ser las causas que producen los parasitos en los niños? (SELECCIÓN MÚLTIPLE) *In your opinion: What do you think can cause parasites in children? (MULTIPLE CHOICE)*	☐Agua contaminada (1) ☐Falta de higiene (2) ☐No hay medicamentos (3) ☐Piso de tierra (4) ☐Falta de letrina (5) ☐El clima (6) ☐Manipular animales (7) ☐No sabe (8) ☐Otro: _____ (9)	*Contaminated water* *Lack of hygiene* *No medicines* *Dirt floor* *Lack of latrine* *Climate* *Working with animals* *Do not know* *Other*
42	Solicite por favor que la persona haga el ejercicio de lavarse las manos y OBSERVE Y MARQUE la forma en que se lava las manos por cada uno de los pasos. / *Ask interviewee to wash their hands and observe/mark whether they follow the steps below:* 1)Mojar ambas manos con agua limpia / *Wet both hands with clean water* ☐Si / Yes (1) ☐No (2) 2) Enjabonar ambas manos / *Lather both hands* ☐Si / Yes (1) ☐No (2) 3) Frotar las palmas, el anverso de las manos, entre los dedos y las uñas al menos tres veces / *Rub palms, back of hands, between fingers and nails at least three times* ☐Si / Yes (1) ☐No (2) 4) Enjuagar con abundante agua limpia / *Rinse with enough clean water* ☐Si / Yes (1) ☐No (2) 5) Secar las manos con una toalla o trapo limpio o moviendo las manos para que el aire las seque / *Dry hands with a clean towel or shake them to air dry.* ☐Si / Yes (1) ☐No (2)	Si la persona cumple con los 5 pasos establecido, el entrevistador debe marcar la casilla SI. Pero, si no cumple con todos los requisitos debe marcar NO. *If the person meets the 5 established steps, the interviewer should mark the YES box. But, if the person does not meet all the requirements, the box NO shoul be marked.* ☐Si (1) ☐No (2) ☐No acepto hacer el ejercicio (3)	 *Yes* *Not* *Do not accept exercise*

	Responder por observación en el patio de la casa (P#43 - P#54) *Respond the following questions through observations (P#43 - P#54)*		
43	Observe: Hay basura amontonada o regada (tirada) en el patio. *Note: is there garbage piled in the patio/yard*	☐Si (1) ☐No (2) ☐No aplica (3)	Yes *No* *Not apply*
44	Observe: Hay charcas en el patio (ver los lugares donde cae el agua de la cocina (lavar trastes); baño y lugar donde lavan la ropa). *Note: are there any puddles around the home (check the places around the kitchen where the water falls (washing dishes area)bathroom and the area where they wash clothings).*	☐Si, solo en la parte de la cocina (1) ☐Si, solo en la parte del baño (2) ☐Ambas (3) ☐No, ninguna (4) ☐No aplica (5)	*Yes, only kichen* *Yes, only bathroom* *Both* *None* *Not apply*
45	Observe: Hay heces de animales o de personas en el patio *Note: are there any animal or human feces on the patio.*	☐Solo de animales (1) ☐Solo de personas (2) ☐Ambos (animales y personas) (3) ☐Ninguna (4) ☐No aplica (5)	*Only animal feces* *Only human feces* *Both (animal and human)* *None* *Not apply*
46	Observe: Tiene chiqueros (para los chanchos/cerdos) en el patio de la casa? *Note: Do you have a pigpen at home? (for pigs only)*	☐Si (1) ☐No (2) ☐No se observa (3) ☐No aplica (4)	*Yes* *No* *Not able to see any* *Not apply*
47	Observe: Tiene gallineros (para gallinas, patos, ganzos, etc) en el patio de la casa? *Note: Do you have a pigpen at home? (for hens, ducks, geese, etc)*	☐Si (1) ☐No (2) ☐No se observa (3) ☐No aplica (4)	*Yes* *No* *Not able to see any* *Not apply*
·	SOLO RESPONDER PREGUNTAS # 48 - PREG#54 SI EN LA CASA HAY LETRINA / INODORO *ONLY ANSWER QUESTIONS P#48 - P#54 IF THE FAMILY HAS A LATRINE*		
48	Observe el acceso a la letrina *Note: on she pashway io she latrine…*	☐Densa vegetación en el camino, no parece usado (1) *Dense vegetation, doesn't seem used* ☐El camino esta limpio, parece usado (2) / *Path clear, seems used* ☐No hay letrina (3) / *Not have latrine* ☐No tiene acceso (4) / *No access to latrine*	
49	Observe si la letrina se encuentra aseada (no esta chorreada, ni con telas de araña o basura en el interior) *Note: is the latrine clean (with no dust or garbage inside)*	☐Si (1) ☐No (2) ☐No hay letrina (3) ☐No tiene acceso (4)	*Yes* *No* *Not have latrine* *No access to latrine*
50	Observe: Asiento o asientos de la letrina están buen estado (sin fractura) *Note: are seats in good shape (not broken)*	☐Si (1) ☐No (2) ☐No hay letrina (3) ☐No tiene acceso (4)	*Yes* *No* *Not have latrine* *No access to latrine*
51	Observe: El asiento de la letrina tiene tapadera *Note: Does the latrine seat for a lid*	☐Si, esta en uso (1) ☐Si, pero no esta en uso (2) ☐No tiene tapadera (3) ☐No hay letrina (4) ☐No tiene acceso (5)	*Yes, and it´s in use* *Yes, but it´s not in use* *No, does not have one* *Not have latrine* *No access to latrine*

52	Observe: la caseta de la letrina esta en buen estado. *Note: is the latrine structure in good shape*	☐Si (1) ☐No (2) ☐No hay letrina (3) ☐No tiene acceso (4)	Yes *No* *Not have latrine* *No access to latrine*
53	Observe: el techo de la letrina esta en buen estado *Note: is the roof in good shape?*	☐Si (1) ☐No (2) ☐No hay letrina (3) ☐No tiene acceso (4)	Yes *No* *Not have latrine* *No access to latrine*
54	Observe: la puerta de acceso a la letrina esta en buen estado *Note: Is the latrine door in good shape*	☐Si (1) ☐No (2) ☐No tiene (3) ☐No hay letrina (4) ☐No tiene acceso (5)	Yes *No* *No door* *Not have latrine* *No access to latrine*
•	EN LAS PREGUNTAS #55 - #57 HACER LAS OBSERVACIONES UNICAMENTE A LOS RECIPIENTES QUE USAN PARA GUARDAR AGUA QUE OCUPAN PARA COCINAR/BEBER *(THE QUESTIONS #55 - #57 DESCRIBE COOKING AND DRINKING WATER STORAGE CONTAINERS ONLY)*		
55	Observe: Están limpios en el interior los recipientes (sin tierra, musgo o suciedad) *Note: Are the insides of the water storage containers clean (w/out dirt, moss, or grime)?*	☐Si, todos (1) ☐No, Ninguno (2) ☐Algunos (3) ☐No, Aplica (4)	Yes, all *None* *Some* *Not Apply*
56	Observe: Están cubiertos los recipientes ... *Note: Are the water storage containers are covered?*	☐Todos (1) ☐Algunos (2) ☐Ninguno (3) ☐No Aplica (4)	All *Some* *None* *Not Apply*
57	Observe: La altura donde estan ubicados los recipientes en que almacenan el agua.... *Note: At which height are storage containers located?*	☐Al alcance de los ninos (1) ☐Sobre alguna superficie (2) ☐Fuera del alcance de ninos (3) ☐En el suelo (4) ☐No Aplica (5)	*Within reach of children* *On a surface* *Out of reach of children* *On the ground* *Not apply*
•	OTRAS OBSERVACIONES / OTHERS OBSERVATIONS		
58	Observe: Hay barandas en las entradas de la puerta principal y en la cocina para impedir el acceso al interior de los animales domésticos *Note: Is there a gate at the entrance of the house and kitchen, which bars animals inside the house?*	☐Si en ambas (1) ☐Solo en la entrada principal (2) ☐Solo en la cocina (3) ☐En ninguna (4) ☐No aplica (5)	Yes in both *Just in main door* *Just in the kitchen* *None* *Not apply*
59	Observe: Presencia de animales domésticos dentro de la casa (cocina, sala u otros cuartos)---- SELECCIÓN MÚLTIPLE *Note: Are there any domestic animals inside the house (kitchen, living room and other rooms) ---- MULTIPLE CHOICE*	☐Gallinas/Patos/ Gansos (1) ☐Chanchos o Cerdos (2) ☐Perros / Gatos (3) ☐Ninguno (4) ☐No aplica (5)	Hens, Ducks, Geese *Pigs* *Dogs / Cats* *None* *Not apply*

Appendix 3: KAP Survey

I Generales / General Questions

Fecha de Supervisión: _____   Encuestador/a: _____   ☐₁ AMOS ☐₂ PAC ☐₃ CSL ☐₄ PSL
Date of supervision   Interviewer

Depto/Región: _____   Municipio: _____   Comunidad: _____   Sector: _____
Dept/Region   Municipality   Community   Sector:

Casa No. _____   Filtro No. _____   Fecha de Instalación del Filtro _____
House number   Filter number   Filter installation date

Nombre de la persona entrevistada: _____
Name of the person being interviewed

Nombre del jefe/a de la vivienda: _____
Name of the head of the household

Cant. De personas que habitan en la vivienda: _____   Cant. De niños/as menores de 5 años que habitan en la vivienda _____
Numb. Of people that live in the home   Number of children under 5 that live in the home

¿Cómo está funcionando su filtro?   ☐₁ Funciona adecuadamente   ☐₂ No funciona adecuadamente
  What's the actual status on your filter   Works properly   Not working properly

        ☐₃ En buen estado pero no utilizado ¿Por qué? _____
           Is in good conditions but's not being used, why?

        ☐₄ Destruido ¿Por qué? _____
           Is destroyed, why?

II Uso adecuado del filtro/Adequate use of the filter

	Pregunta	Opciones
1	¿La semana pasada, cuántos días uso su filtro de agua? *During the last week, how many days did you use your filter?*	☐₁ Diario / *Daily* ☐₂ 1 vez / *1 time* ☐₃ 2 veces / *2 times* ☐₄ 3 veces / *3 times* ☐₅ 4 veces / *4 times* ☐₆ 5 veces / *5 times* ☐₇ 6 veces / *6 times*
2	¿Cuántas veces al día está echando agua al filtro? *How many times a day do you put water in your filter?*	☐₁ 1 vez / *1 time* ☐₂ 2 veces / *2 times* ☐₃ 3 veces / *3 times* ☐₄ veces / *4 times* ☐₅ 5 veces / *5 times* ☐₆ Otra, especificar _____ / *Other*
3	¿Qué cantidad de agua está echando en el filtro cada vez que le echa agua? *How much water do you pour into your filter?*	☐₁ Menos de 20 lts / *Less than 20 lts* ☐₂ 20 lts / *20 liters* ☐₃ Más de 20 lts / *More 20 liters*
4	¿Utiliza el colador cuando echa agua en su filtro? *Do you use the collander when you pour water into the filter?*	☐₁ Siempre / *Always* ☐₂ A veces / *At times* ☐₃ Nunca / *Never*
5	¿Echa cloro dentro de su filtro? *Do you put chlorine in your filter?*	☐₁ Si, siempre / *Yes, always* ☐₂ No, nunca / *No, never* ☐₃ Si, a veces / *Yes, at times*
6	¿De dónde toma agua usted y su familia? *Where do you and your family get water?*	☐₁ Filtrada / *Filtered* ☐₂ No Filtrada / *No filtered* ☐₃ Ambas / *Both*
7	¿Cuándo fue la última vez que le echó agua a su filtro? *When was the last time your poured water in your filter?*	Día / *Day* Mes / *Month* Año / *Year*

III Calidad del agua/Quality of the water

	Pregunta	Opciones
8	¿El agua que le da el filtro es suficiente para usted y toda su familia? *Does your filter provide you and your family with enough water*	☐₁ Si / *Yes* ☐₂ No / *No*
9	¿Le gustaria adquirir un otro filtro? Solo pregunta si la respuesta a 8 es "No" *Would you like to aquire another filter? Only ask if the answer to 8 is "No"*	☐₁ Si / *Yes* ☐₂ No / *No*
10	¿Qué le parece el sabor del agua que le da su filtro? *What do you think of the flavor of the water that comes out of your filter?*	☐₁ Bueno / *Good* ☐₂ Malo / *Bad* ☐₃ Regular / *Average*
11	¿Durante la semana pasada el agua del filtro le ha salido con mal olor? *In the last week has your filtered water had a bad odor?*	☐₁ Si / *Yes* ☐₂ No / *No*

IV Mantenimiento Diario al filtro/Daily filter maintenance

	Pregunta	Opciones
12	¿Cada cuánto le realiza retrolavado al filtro? *How often do you backwash your filter?*	☐₁ Diario / *Daily* ☐₂ 2 veces por semana / *2 times at week* ☐₂ 3 veces por semana / *3 times at week*
13	¿Usa la jeringa para hacer el retrolavado? *Do you use the syringe to do the backwashing?*	☐₁ Si / *Yes* ☐₂ No / *No* ☐₃ No, tiene (quebrada) / *No, does not have (broken)*
14	¿Cuántas veces le echa agua con la jeringa al filtro para hacer el retrolavado? *How many times do you fill the syringe with water to backwash?*	☐₁ 1 vez / *1 time* ☐₂ 2 veces / *2 times* ☐₃ 3 veces / *3 times* ☐₄ veces / *4 times* ☐₅ 5 veces / *5 times* ☐₆ Otra _____ / *Other*

15 ¿Qué tipo de agua usa para hacer el retrolavado? *What type of water do you use for backwashing?*	1 Filtrada *Filtered* 2 Sin filtrar (de la fuente) *Not filtered (From the source)*	3 Hervida *Boiled* 4 Clorada *Chlorinated*

V Uso adecuado de recipientes/ Adequate use of the recipients

16 ¿Tiene un recipiente o pichingas aparte para echarle agua al filtro? *Do you use any other recipient to pour water into your filter?*	1 Si *Yes*	2 No *No*
17 ¿Usa un recipiente solamente para almacenar agua filtrada? *Do you use a recipient only to store filtered water?*	1 Si *Yes*	2 No *No*
18 ¿Cuántas veces a la semana lava el recipiente donde guarda el agua? *How many times during the week do you clean your storing recipient?*	1 Diario *Daily* 2 1 vez *1 time*	3 2 veces *2 times* 4 3 veces *3 times*
19 ¿Qué tipo de agua utiliza para lavar el recipiente donde guarda el agua? *What type of water do you use to clean your storing recipient?*	1 Filtrada *Filtered* 2 Sin filtrar (de la fuente) *Not filtered (from the source)*	3 Hervida *Boiled* 4 Clorada *Chlorinated*

VI Estado físico del recipiente y reparaciones realizadas/ Physical state of the recipient and repairs

20 ¿Recibio el recipiente para almacenar agua que entrego Fund. AMOS? *Did you receive a storing recipient from AMOS?*	1 Si/Yes *Yes* 2 No *No*	3 No sabe / No responde *Doesn't know*
21 ¿Cuál es el estado físico del recipiente? *What's the physical state of the recipient?*	1 Buen estado y utilizado *Good shape and in use* 2 Mal estado/*Bad shape*	3 Buen estado y no utilizado *Good but not being used* 4 Destruido/*Destroyed*

	Estado actual / Current State	Reparaciones realizadas
22 ¿La llave del recipiente tiene problemas de filtración de agua? *Is the recipient faucet leaking?*	1 Si / Yes 2 No	1 Si / Yes 2 No
23 ¿La llave del recipiente esta quebrada? *Is the recipient faucet broken?*	1 Si *Yes* 2 No	1 Si *Yes* 2 No

VII Impacto en la salud/Impact on health

24 En las últimas dos semanas: / *During the last two weeks:* ¿Algún miembro del hogar ha sufrido problemas de diarrea? *Has any member of your family suffered from diarreah?*	1 Si *Yes* 2 No *No*
25 ¿Piensa usted que la salud de su familia ha cambiado con el uso del filtro? ¿En que sentido? *Do you think the health of your family has changed due to the filter? In what sense?*	1 Ha mejorado 2 Ha empeorado *It has improved* *It has worsened* 3 No, ¿Por qué?/*No, why?* _____
26 ¿Qué mejorias ha observado en la salud de la familia con el uso del filtro? (Preguntar solo si la respuesta de la Preg.#25 es "Ha mejorado") *What kind of health improvements have you seen as a result of using the filter?* *Ask this question only if they answered "It has improved" to question 25*	_____ _____ _____ _____

VIII Observaciones / Observations — Estado actual/Actual state

27 ¿La tapa del filtro tiene alguna quebradura? *Is the lid of the filter broken?*	1 Si *Yes*	2 No *No*	3 No, tiene *Does not have*
28 ¿El balde del filtro tiene alguna quebradura? *Is the filter bucket broken?*	1 Si *Yes*	2 No *No*	3 No, tiene *Does not have*
29 ¿La llave de chorro del filtro esta quebrada o rajada? *Is the filter's faucet broken or cracked?*	1 Si *Yes*	2 No *No*	3 No, tiene *Does not have*
30 ¿El colador se encuentra en buen estado? *Is the collander in good shape?*	1 Si *Yes*	2 No *No*	3 No, tiene *Does not have*
31 ¿La jeringa se encuentra en buen estado? *Is the syringe in good shape?*	1 Si *Yes*	2 No *No*	3 No, tiene *Does not have*
32 ¿El recipiente para almacenar agua tiene tapadera? *Does the storing recipient have a lid?*	1 Si *Yes*	2 No *No*	
33 ¿El recipiente para almacenar agua se ve limpio (sin suciedad)? *Is the container for storing water looks clean (no dirt)?*	1 Si *Yes*	2 No *No*	
34 ¿La llave del recipiente se encuentra limpia (sin tierra o musgo)? *Is the recipient key clean, without dirt or mold?*	1 Si *Yes*	2 No *No*	3 No tiene *No, does not have*
35 ¿La manguerita del filtro se encuentra limpia (sin tierra o musgo)? *Is the filter tube is clean, without dirt or mold?*	1 Si *Yes*	2 No *No*	3 No tiene *No, does not have*
36 ¿Cuánto tiempo tarda en filtrar un litro de agua? *How long does it take to filter 1 liter of water?*	Tiempo: _____ *Time*	lo ideal es menos 2 min	

Appendix 4: SAM-3 Filter Survey

FUNDACIÓN AMOS
AGUA Y SANEAMIENTO BÁSICO / PROYECTO DE FILTROS DE AGUA
FSPFA#1 / FICHA DE SUPERVISIÓN DE FILTROS DE AGUA DE CERÁMICA

I Generales / General Questions

Fecha de Supervisión: _____ Encuestador/a: _____ ☐1 AMOS ☐2 PAC ☐3 CSL ☐4 PSL
Date of supervision   *Interviewer*

Depto/Región: _____ Municipio: _____ Comunidad: _____ Sector: _____
Dept/Region   *Municipality*   *Community*   *Sector:*

Casa No. _____ Filtro No. _____ Fecha de Instalación del Filtro
House number   *Filter number*   *Filter installation date*

Nombre de la persona entrevistada: _____
Name of the person being interviewed

Nombre del jefe/a de la vivienda: _____
Name of the head of the household

Cant. De personas que habitan en la vivienda: _____   Cant. De niños/as menores de 5 años que habitan en la vivienda _____
Numb. Of people that live in the home   *Number of children under 5 that live in the home*

¿Como está funcionando su filtro?   ☐1 Funciona adecuadamente   ☐2 No funciona adecuadamente
What's the actual status on your filter   *Works properly*   *Not working properly*

☐3 En buen estado pero no utilizado ¿Por qué? _____
Is in good conditions but's not being used, why?

☐4 Destruido ¿Por qué? _____
Is destroyed, why?

II Uso adecuado del filtro / Adequate Use of the Filter

1. ¿La semana pasada, cuántos días uso su filtro de agua?
During the last week , how many days did you use your filter?
☐1 Diario *Daily*   ☐2 1 vez *1 time*   ☐3 2 veces *2 times*   ☐4 3 veces *3 times*
☐5 4 veces *4 times*   ☐6 5 veces *5 times*   ☐7 6 veces *6 times*

2. ¿Cuántas veces al día está echando agua al filtro?
How many times a day do you put water in your filter?
☐1 1 vez *1 time*   ☐2 2 veces *2 times*   ☐3 3 veces *3 times*   ☐4 Otra *Other*

3. ¿Qué cantidad de agua está echando en el filtro cada vez que le echa agua?
How much water are you pouring in your filter?
☐1 Menos de 20 lts *Less than 20 lts*   ☐2 20 lts *20 lts*   ☐3 Más de 20 lts *More than 20 lts*

4. ¿Echa cloro dentro de su filtro?
Do you put chlorine in your filter?
☐1 Si, siempre *Yes, always*   ☐2 No, nunca *No, never*   ☐3 Si, a veces *Yes, sometimes*

5. ¿De dónde toma agua usted y su familia?
Where do you and your family get your water?
☐1 Filtrada *Filtered*   ☐2 No Filtrada *Not filtered*   ☐3 Ambas *Both*

6. ¿Cuándo fue la última vez que le echó agua a su filtro?
When was the last time that your poured water on your filter?
Día / *Day*   Mes / *Month*   Año / *Year*

III Calidad del agua / Quality of the Water

7. ¿El agua que le da el filtro es suficiente para usted y toda su familia?
Does your filter provide you and your family with enough water
☐1 Si, todo el año *Yes, all year*   ☐2 Nunca *Never*
☐3 No, solo en verano *No, just in the dry season*   ☐4 No, solo en invierno *No, just in the rainy season*

8. ¿Qué le parece el sabor del agua que le da su filtro?
What do you think of the flavor of the water that comes out of the filter?
☐1 Bueno *Good*   ☐2 Malo *Bad*   ☐3 Regular *Regular*

9. ¿ Durante la semana pasada el agua del filtro le ha salido con mal olor?
Within the last week does the water from your filter ever have a bad smell?
☐1 Si *Yes*   ☐2 No *No*

IV Estado físico y mantenimiento del filtro / Physical State and Maintenance of Filter

10. ¿Cada cuánto lava la funda de su filtro?
(Preguntar solo si el filtro tiene la funda)
How many times do you wash the cover? (Ask only if the filter has a cover)
☐1 Diario *Daily*   ☐2 1 vez por semana *1 time per week*   ☐3 1 vez cada 15 días *1 time every 15 days*
☐4 1 vez por mes *1 time per month*   ☐5 Nunca *Never*

11. ¿Qué utiliza para lavar la funda de su filtro?
What do you use to clean the cover?
☐1 Jabón/detergente *Soap/ detergent*   ☐2 Cloro *Chlorine*   ☐3 Solo agua *Only Water*

12. ¿Cada cuánto le da mantenimiento a la cerámica de su filtro?
(cada cuanto lava la cerámica)
How often do you *clean your filter ceramic? (How often you wash it?)
☐1 Diario *Daily*   ☐2 1 vez por semana *1 time per week*   ☐3 1 vez cada 15 días *1 time every 15 days*
☐4 1 vez por mes *1 time per month*   ☐5 Nunca *Never*

13. ¿Qué actividades realiza para darle mantenimiento a la cerámica del filtro?
How do you keep your ceramic filter clean? Check all that apply
☐1 Restregar/pastear el filtro con un paste verde *Scrub the filter with the green scrubber*
☐2 Limpiar la cerámica con un paño *Clean the ceramic with a cloth*

---

	3 Otra (especifique)	
	Other (specify) _____	
14 ¿Qué utiliza para lavar la cerámica de su filtro?	1 Jabón/detergente 2 Cloro 3 Solo agua	
What do you use to clean your ceramic filters?	*Soap/ detergent Chlorine Just water*	
	4 Paste verde 5 Cepillo de lavar ropa 3 Otro	
	Green Scrubber Washing brush Other	

V Uso adecuado de recipientes / Adequate use of the recipients

15 ¿Tiene un recipiente o pichingas aparte para echarle agua al filtro?	1 Si 2 No	
Do you have any other recipient that you use to pour water into your filter?	*Yes No*	
16 ¿Usa un recipiente solamente para almacenar agua filtrada?	1 Si 2 No	
Do you have a recipient that you only use to store filtered water?	*Yes No*	
17 ¿Cuántas veces a la semana lava el recipiente donde tiene el filtro?	1 Diario 2 1 vez por semana 3 Otras	
How many times do you wash your storing recipient?	*Daily 1 time per week Other*	
18 ¿Cuántas veces a la semana lava el recipiente donde guarda el agua?	1 Diario 2 1 vez por semana 3 Otras	
How many times do you wash your storing recipient?	*Daily 1 time per week Other*	
19 ¿Qué tipo de agua utiliza para lavar el recipiente donde guarda el agua?	1 Filtrada 3 Hervida	
What type of water do you use to clean your storing recipient?	*Filtered Boiled*	
	2 Sin filtrar (de la fuente) 4 Clorada	

VI Impacto en la salud / Impact on Health

20 En las últimas dos semanas:	1 Si 2 No	
¿Algún miembro del hogar ha sufrido problemas de diarrea?	*Yes No*	
Has any member of your family gotten sick with diarreah in the last two weeks?		
21 ¿Piensa usted que la salud de su familia ha cambiado con el uso del filtro? ¿En que sentido?	1 Ha mejorado 2 Ha empeorado	
Do you think the health of your family has changed because of the use	It has improved It has worsened	
of the filter? In what sense?	3 No, ¿Por qué?/No, why? _____	
22 ¿Qué mejorias ha observado en la salud de la familia con el uso del filtro?	_____	
(Preguntar solo si la respuesta de la Preg.#21 es "Ha mejorado")	_____	
	_____	
What kind of health improvements have you seen as a result of using the filter?	_____	
Ask this question only if they answered "It has improved" to question 21		

VII Observaciones / Observations

	Estado actual / Current State	Reparaciones realizadas
23 ¿La llave del recipiente tiene problemas de filtración de agua?	1 Si 2 No	1 Si 2 No
Does the key faucet have any leakage problems?	*Yes No*	*Yes No*
24 ¿La llave del recipiente esta quebrada?	1 Si 2 No	1 Si 2 No
Is the recipient key faucet broken?	*Yes No*	*Yes No*
25 ¿Cómo se encuentra el balde plástico que contienen el filtro?	1 Buen estado 2 Semi rajado 3 Mal estado	
Look at the plastic bucket and mark all the options that apply?	*Good shape Half-Broken Bad shape*	
26 ¿La cerámica del filtro tiene funda?	1 Si 2 No	
Does the filter ceramic have a cover?	*Yes No*	
27 ¿Cúal es la condición de la tela del filtro?	1 Buen estado (color blanco sin hoyos)	
(Preguntar solo si el filtro tiene la funda)	*Good condidition (white without holes)*	
What is the condition of the cover?	2 Regular estado (color oscuro y sin hoyos)	
(Ask only if the filter has a cover)	*Normal condition (off-white without holes)*	
	3 Mal estado (de color oscuro con hoyos)	
	Bad State (Dark color with holes)	
28 ¿El balde que contiene la cerámica tiene tapadera)	1 Si 2 No	
Does the bucket have a covering?	*Yes No*	
29 ¿El recipiente para almacenar agua tiene tapadera?	1 Si 2 No	
Does the recipient (for storing water) have a lid?	*Yes No*	
30 ¿El recipiente para almacenar agua se ve limpio (sin suciedad)?	1 Si 2 No	
Does the storing recipient look clean (does it have dirt?)	*Yes No*	
31 ¿La llave del recipiente se encuentra limpia (sin tierra o musgo)?	1 Si 2 No 3 No tiene	
Is the recipient key clean? (Without dirt or moss)	*Yes No Doesn't have one*	
32 ¿Cuál es el estado físico del recipiente en donde almacena su agua filtrada?	1 Buen estado y utilizado 3 Buen estado y no utilizado	
What's the physical status of the recipient?	*Good state and in use Good state but not in use*	
	2 Mal estado 4 Destruido	
	Bad State Destroyed	
33 ¿Cuál es el ancho de la cerámica? (Medir) *The width of the ceramic?*	_____ cms	

Appendix 5: Ceramic Filter Survey

Lesson Plans

Lesson 1: Personal hygiene

Objectives:

1. Share knowledge about personal hygiene habits

2. Explain about diseases plus communities due to lack of water and personal hygiene

3. Unify criteria on the desired practices of personal hygiene

   a) Identify the main habits of personal hygiene that we must perform daily
   b) Emphasize that hand washing is the most important way to prevent the spread of disease
   c) Identify the moments when we have to wash our hands
   d) Steps to follow when washing hands
   e) Describe appropriate designated place to wash hands

Materials: Flip chart, permanent markers, masking tape, attendance formats, soap and filtered water

 1. Game or Song:

1. Hand washing set that follows the steps necessary to take one for the correct washing of hands:

   a) Wash hands with soap and water (or ash)
   b) Rub the palms, the back of the hands and between the fingers at least 3 times.
   c) Rinse soap scum or ash with plenty of water
   d) Dry hands with a clean towel or let air dry

Step 4. Promotion of Behavior Change through drawings, 30 minutes.

Introduce and explain the concept of germs and the importance of hygiene in the prevention of diseases??

1. Diseases are caused by small things that we cannot see called germs. The things we do on a daily basis to keep ourselves clean, called personal hygiene, help stop the spread of germs and therefore stop the spread of the disease. Many diseases are caused by the lack of personal hygiene, which is why it is so important to practice good daily hygiene habits.

Outline the main habits of personal hygiene that we must perform daily

1. Wash ourselves with soap and water. The use of a brush / exfoliant to remove dirt of the body and avoid diseases.
2. Clean the nails and keep them trimmed, to prevent the transfer of bacteria of long nails unfulfilled.
3. Brushing the teeth after each meal.
4. Clean your ears every day, using a soft cloth wrapped around your little finger.
5. Daily change of clothes. Underwear / underwear can help the skin spread. Illnesses if they are not changed regularly.
6. Cut hair once a month to avoid parasites of the head / lice. Those people with long hair should wash your hair at least twice a week (using soap or shampoo).
7. Wash hands with soap and water or ash to eliminate microorganisms that cause disease

Explain the importance of hand washing and once again review the steps of proper hand washing

1. The germs on our hands can spread to our bodies through the mouth, nose and eyes. We can avoid this extension if we wash our hands correctly and regularly. Hand washing is both a very simple thing and also the most important way to prevent the spread of diseases

2. The times when you should wash your hands are:
   a. Before cooking or preparing food
   b. Before eating and feeding children
   c. After using the bathroom, after changing diapers, or bathing / cleaning a baby to a baby
   d. After using chemicals (which can be harmful to health)
   e. After picking up or taking out the trash, because the trash can contain and many microorganisms carrying the infection
   f. After touching or handling animals, because they carry the microorganisms in their saliva and in the skin / hair.
   g.
3. Steps to follow when washing hands:
   a. Wash hands with soap and water (or ash)

b. Rub the palms, the back of the hands and between the fingers at least 3 times.
c. Rinse soap scum or ash with plenty of water
d. Dry hands with a clean towel or let air dry
e. It is important to supervise children during hand washing and explain the correct way to do it
f. It is necessary to have an appropriate space / place designated for hand washing, which:

- It is located in a place that everyone in the home can access (inside or outside the house)
- It has a height that allows children to use it comfortably
- Has access to water (through a tube or by using a container with clean water)
- Has soap or ashes available
- Have a clean towel or cloth to dry your hands once they have been washed

Activity:

Wash your hands!

Sing to the tune of "if you're happy and you know it"

If you use the latrine, wash yourself! Hands! (x2)

Water and soap truly prevent disease

If you use the latrine, wash yourself! Hands!

If you're going to eat something wash yourself! Hands! (x2)

Water and soap truly prevent disease

If you're going to eat something wash yourself! Hands!

If you touch animals, wash yourself! Hands! (x2)

Water and soap truly prevent disease

If you touch animals, wash yourself! Hands!

If you do not want to get sick, wash yourself! Hands! (x2)

Water and soap truly prevent disease

If you do not want to get sick, wash yourself! Hands!

Only twenty seconds wash! Hands! (x2)

Water and soap truly prevent disease

Only twenty seconds wash! Hands!

Questions to ask to check the understanding of proper hand washing:

1. Show how to wash your hands

2. When do we have to wash our hands?

3. Why do we use soap or ashes?

4. Why do we use clean water?

5. Why do we use a towel or cloth to dry our hands?

6. Why is it important that they accompany them or watch children when they wash their hands?

7. Why is it important to have a special or designated place to wash your hands?

DISCUSS THE POSSIBLE BARRIERS AND SOLUTIONS - 15 minutes

Lead a discussion:

What do you think of these ideas? Do you think it will be difficult to follow these tips? Is there anything that could prevent you from following these tips.

Ask the participants to talk with the person sitting next to them. They should share any personal concerns they have about the lesson. Together, they should try to find solutions to these concerns and problems. After five minutes, ask the facilitator to share what they have talked about.

Help them find solutions to their concerns. Encourage them to try these practices. If a participant offers a good solution to someone else's concern, praise them and encourage people to consider this solution when talking with other people.

PRACTICE AND ACCOMPANIMENT (SUPPORT)
1. Ask the PACs to share the lessons they have learned today. They should share with others in the group, using the teaching method they have learned.
2. Tell the PACs that, having heard the message, give an objection or an excuse to the lesson; a reason why this message would be difficult to accept.
3. The PACs, by sharing the message, should try to help people overcome this obstacle.
4. After ten minutes, the PACs must change roles.
5. The promoter must observe, correct and help the PACs that have problems.

6. When everyone is finished, ask them to answer some questions they have about today's lesson.

ASK FOR COMMITMENTS

Are you willing to commit to follow the new practices we are talking about today?

Ask that the PACs that want to make a commitment give a verbal statement of their commitment.

Lesson 2: Use and transport of water

Part 1: Objectives - 5 minutes

Identify the activities carried out by the different people living in the house around the transfer and handling of water.

Materials:
1. Community promoter's guide / FECSA
2. Water Manual for Living / Hesperian Foundation
3. Presentation of water, hygiene and sanitation / CAWST
4. Community manual for the improvement of quality and access to water / Ecuadorian Red Cross.
5. Flip chart, permanent markers, masking tape, attendance formats.
6. Bucket container (2), plastic cups, 2 containers or water pichingas (for the game).

Part 2: Review song 10 minutes
Ask the participants to divide into two groups (account 1 and 2)
- The facilitator will ask that each group create a song based on the topics discussed yesterday.
- Each group will present their songs.
- The facilitator will ask participants what they learned from yesterday and thoughts about the dynamics.

Part 3: Promote Behavior Change [Water Transportation] 15 minutes.
The facilitator will do a trivia and all the people can raise their hands to answer and then ask a question followed with the correct answer:

Question # 1: "What do you think is the average time it takes to transport water?" And then he / she will give you the options: "Less than ten minutes, 10 minutes, or more". Afterwards, the facilitator can mention that 55.77% of the people, according to the survey, the water transport lasts less than 10 minutes.
Question 2: Who is generally responsible for carrying the water? "" Women, adolescents, or men?
Question 3: How often should the container be washed? "(This is not multiple choice unless there is no response)

- The answer: 41% of the participants have washed their recipients every day, while 51% have not washed daily.
- "Facilitator can ask / explain the bad behaviors that include:
- The containers do not have a cover / lid.
- The upper part of the container is not clean.
- Do not wash your hands before using the container.
- Put the container on the ground.
- Never use containers that have pesticides or chemicals, even if they are cleaned.
- "Also reinforce the importance of transporting water that is clean:
- That the water be used for multiple functions
- Water sickness and pollution can equally contribute to human use of water instead of rain or natural use.
- Then ask: "Are there any problems / barriers that participants have encountered when transporting water?"

Part 4: [What did they observe?] 15-30 minutes
- This activity will consist of two parts: Observing a drawing and putting the images in order.
- The facilitators will ask the participants to divide into three groups again.
- The two groups will see a drawing that shows the problems encountered with water transport:

Do not wash the containers sufficiently.
Chemical products
The container to carry the water is on the ground instead of a surface
Bucket has no cover / lid.
The participants should share what they observed in the drawings.
- Participants will discuss in their groups for 5 minutes.
- Once the time is up, a group will change their drawings and share their observations with the other groups.

Part 5: Discussion of possible barriers and solutions - 15 minutes.
Ask / explain the necessary steps to carry out water transport (based on the exercise) and identify some of the possible barriers / problems.
- Are the people who use the caps for the receiver cube?
- Are they perceived as a problem?
- Why do not people use a lid / cover for the container?

- How to convince mothers or people in charge of putting a lid / cover on the container.
- "Ask if the water has been cleaned properly:
- Are people using chlorine to clean the water?
- Is it perceived as a problem?
- Why do people use chlorine as the main method to treat water?
- "Also ask about people:
- Why do some people clean the container every day instead of every 2 days or more?
- Are the containers out of the reach of children?
- "Ask / explain some solutions to these barriers:
- Wash the bucket designated to transport the water.
- Avoid placing containers on the floor. Avoid that the container is out of the reach of children or animals.
- Put the water in the bucket without touching the "spicket".
- Wash the glasses used to drink.
- Ask if any of these solutions would be difficult to achieve.
- What are the barriers / difficulties that could prevent these solutions?

End session with questions / final comments.

Lesson 3: [Methods of water disinfection and how to store the treated water]

Goals:

1) A family member should clean containers with disinfected water once a day.

2) A family member must permanently secure the filter complex (top and bottom of the bucket, including the ceramic filter) to a sturdy wall, with a safety belt.

3) The houses should designate an elevated surface to place the receivers in what is out of the reach of animals and children.

4) A family member should scrub / clean the recipient's key with filtered or chlorinated water once a week.

5) Families should filter no less than two buckets per day.

Materials

- Flipcharts

- Permanent markers
- Masking tape
- A Recipient Bucket
- Water
- A rag

Dynamic:

Promotion of Behavior Change / Information

Speaker is going to divide this section into two parts:

1) Methods of water purification.

2) Methods to avoid contamination of filtered water.

Part 1:

- "Ask the audience:
  "Why is it important to drink clean water?"

    "What types of methods are known to disinfect water?"

    "Do you use any of these in your homes?"

    "Transition to an explanation of the different filtration methods

     Boiling: "Boiling is quite simple and very effective in eliminating water microbes; however, it is important to remember two things when using this method.

1) The water must be boiled for five to ten minutes to disinfect the water.

2) Boiled water may taste bad, despite bad taste, the water is still clean, putting the water in a clean bottle and shaking it can improve the taste."

"The sun method:" The sun can also be used to purify water. "

Methods:

- Find a transparent plastic bottle or container (1-3 liters). Bottle or container must be transparent so that the sun can reach the water
- Clean the bottle or container completely and remove all labels."
- Fill each 3/4 bottle with water and shake for 20 seconds (to create bubbles in the water). Then, open the bottle or container and finish filling it. "
- Place full bottles or containers outside the house in a safe place where they are exposed to sunlight (preferably the roof of the house). "
- Leave the bottles or container for at least one full day - the longer they are exposed to the sun, the better the quality and safety of the water."
- A good strategy is to leave it on the roof and get it back at night.
- If it is cloudy, expose the bottle to the sun for 2-3 days

Chlorination:

- Chlorination is a simple chemical method that can be used to disinfect water."
- When using this method, be sure to use containers with lids, use the recommended amount of chlorine, and use a dropper."
- Refer to the flipchart graphs one chlorine quantity.

Filtration:

- Once the filter has been mounted, you only have to add / add water to the appropriate container that contains the filter material and, depending on the type of filter, wait until the water passes through the layers of filter material, which removes impurities and improves water quality ".

Part 2: Keep the water clean after it has been filtered

"Ask the audience:

- Where do you keep the clean water after it has been filtered?"
- How do you ensure that the filtered water has been kept clean before drinking it?"
- More specifically," how do you keep a clean recipient? "
- If they do not present the following questions, take them to discussion: the height of the recipient (is it within the reach of animals and children?), the frequency in which they clean the containers (it must be daily), if they clean the key of the recipient (always they must be covered and cleaned once a week), and the filter must be placed against the wall with a safety belt to prevent it from falling, and it must have a lid.

Activity:

Step 1: The Drama Partner — 5 Minutes

"Assign team members character roles

- Characters
  - Storyteller
  - Mother
  - Boy
  - Dog (barks, crawls, or wears a suit)

Part 1:

- Establish:
- Place a container (or object representing the container) on a bench or table that is low enough so that the key of the recipient is within the reach of a dog or child.
- Place the cleaning tools next to the container.
- If a container with a key is not used, use a masking tape to attach a biographer under the container, where the key is usually found and explain to the audience.

Scene 1: Problem: Destiny is within the reach of children and animals.

1. Mother: Walk towards the container and pretend to be cleaning it.

2. Child: Call your mother.

3. Mother: He moves away from the container and goes to the child, pretending to converse with him.

4. Dog: Barks, crawls towards the key of the recipient (container), pretends to lick the key of the recipient. Then it crawls out of the receiver.

5. Child: "I'm thirsty."

6. Mother: Give the child a cup of water from the recipient / container.

Follow-up:

Question for the audience:

"What did you just saw?"

"What are the problems you saw?"

"Is there any barrier to solve this problem?"

"" How can we address these barriers? "

"Scene 2: Problem: The recipient does not

1. Narrator: "Day one."

2. Mother: Aims to clean the receiver, pretend to put the filtered water in the receiver, pretend to fill a glass of water and drink.

3. Narrator: "Day two."

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4. Mother: Put the water in the receiver, try to fill a glass and drink it.

5. Repeat # 3 and # 4 twice more (Narrator continues to increase the number of days elapsed)

6. Narrator: "Day 5."

7. Mother: Put water in the receiver, fill a glass of water and drink. Pretend to be sick.

"Follow-up

- Question for the audience:
- "What did you just saw?"
- "What are the problems with what you saw?"
- "Is there a barrier to solving this problem"
- "How can we address these barriers?"

DISCUSS THE POSSIBLE BARRIERS AND SOLUTIONS - 15 Minutes

Barrier Statistics:

- 19% of people who have filters are not using; They are destroyed, they do not work well, or they are in good condition, but they are not being used
- What makes the filters not work well and what could help to prevent them from breaking (not using enough-2 containers a day), not cleaning enough, does not have a filter)?
- 59% of people who have filters did not wash them daily, and most of the houses that were washing their receivers once a week also said that they had recently had a family member with diarrhea.
- Why is it important to wash the filters every day?
- What prevents people from washing them every day?
- How can we change this?
- 15% of the homes had visibly dirty receiver keys, most of the houses had the keys of the receivers within reach of the children, and 84% of the houses have animals in their homes.
- How often do you think you should clean the receiver's key?
- How can we prevent children and animals from touching the mouth of the key?

Lesson 4: Use of Bathrooms

Step 1, Objectives:
5 minutes

- Know how we can stop the spread of diseases with the use of bathrooms
- Build a bathroom with the basic requirements
- Proper use of bathroom to meet physiological needs
- Know the importance of proper use and maintenance of bathroom

Materials:
● Flip chart, markers, methodology, photo of detonator (man using the bathroom in open air), photo of bathroom in good condition, photo of a person cleaning the bathroom

**Step 2, VENCER (Defeat) with picture:**
10 Minutes

Activity steps:
1. *The facilitator has flipchart with photo or drawing of a man using the bathroom in open air.*
2. *The facilitator makes the steps of DEFEAT with the participants as follows:*
   a. *What do we SEE?*
   b. *EXPLAIN what happens? What's going on?*
   c. *Does this happen here in OUR lives or communities?*
   d. *What are the most important CAUSES why this happens?*
   e. *What would be the EFFECT if we do nothing?*
   f. *What ACTIONS can we take to KEEP OR BUILD here and now?*
3. The facilitator says: "Thank you for your participation! It is very important to protect water sources from fecal matter (human and animal) because it can cause many diseases like diarrhea, hepatitis (a big problem with your liver). It is especially dangerous for children and people old because they do not have the strength as healthy adults to fight infections. "

4. The facilitator says: "Now, let's talk more about the methods to build, use, and maintain latrines to protect your water sources and defecation health in community areas."

* Example of man using the bathroom in open air

We will start today's lesson.
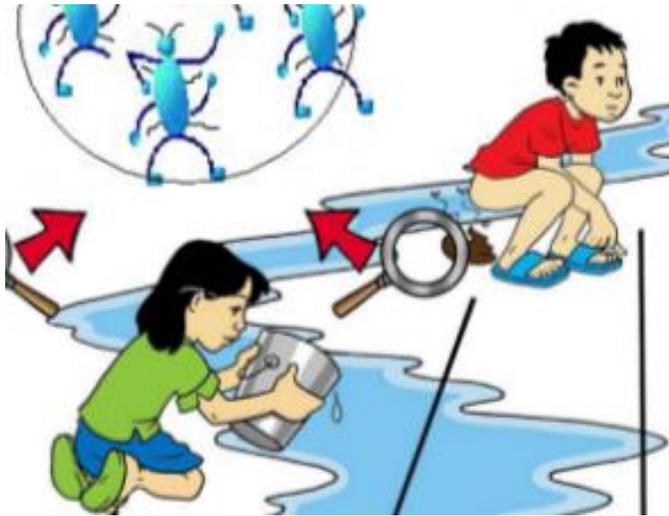
Step 3, Lesson on Use and Proper Maintenance of Latrines:
15 minutes

1. The facilitator has the CAP survey data on the number of houses that have a bathroom, the number that uses a bathroom, and the number of houses that maintain the bathroom in good condition. The facilitator makes reference to the data during the presentation.
2. The facilitator asks: "What should be the ideal physical characteristics of a bathroom? Where is it better to put the bathroom?"
3. The facilitator talks about the characteristics of a good bathroom using a photo.
   a. Where can you build a bathroom?
i. It is better to build a downhill bathroom from a water source

ii. It is necessary to build a bathroom away from a water source. It is recommended 30 meters or more of a water source

iii. The latrine should not penetrate underground water because it could contaminate it

      b. Privacy.
  I. A toilet can be simple but the need for privacy makes it important to have a good infrastructure.
  II. The most pleasant toilet usually has:
- Main door
- Covered (walls)
- Ceiling
- Stool for adults and children
- A cover to cover the stool

     c. Security
  I. Using a poorly constructed toilet can be dangerous. If the toilet is far from home, women may be at risk of sexual violence. Therefore, the toilet should be well constructed and, in a place, not too far from the main house.
      d. Comfort
  I. Very similar to privacy.
  II. It is more likely that people who use a toilet that has a comfortable place to sit or squat with enough space to stand and turn around.

e. Cleaning
  I. People are more likely to use the toilet that is very clean. It is better to clean the toilet frequently and make sure that all of the toilet paper is inside the toilet, there is no bad smell, that it is disinfected.

4. The facilitator asks: "What are the steps for the proper use of a toilet? Who needs to use the toilet and why is it important to use the toilet for their needs?"
5. The facilitator demonstrates the steps of the proper use of a toilet.
   a. All people (women and men and children who are not using diapers) need to use the latrine for their needs. It is easier for a man to use the outdoors but remember that this action can contaminate the water source.
   b. Wear shoes and never enter a barefoot latrine.
   c. After defecating, clean with toilet paper correctly and throw the paper inside the toilet or the dumpster when finished.
   d. Close or place the bank lid to prevent flies and mosquitoes from entering.
   e. We close the door to prevent animals from entering.
   f. Wash hands well with soap / ashes and water and dry them well.
6. The facilitator talks about the handling of bathrooms. Ask participants "What are the steps to maintain your bathroom? What kind of activities and how often?"

a. At least once a week, the toilet (bench and floor) should be flushed with soap or ashes.

b. After cleaning, apply lime or manure to help stabilize the excreta

c. Eliminate the pools that are close to the sanitary to avoid breeding places by the mosquitoes.

If you need to fix the toilet, do it.

Example of a well-built bathroom.

Example of a person cleaning the toilet.

Sociodrama about the use of bathrooms [15 minutes]

Discuss the possible barriers and solutions [15 minutes]

Step 5, Request the commitment to test the new behavior.
They can use similar directions to the example below, changing them to be more related to their lesson plan.
10 minutes
Example: Are you willing to commit to follow the new practices we are talking about today?
Ask the mothers who want to make a commitment to give a verbal statement of their commitment.

Lesson 5: Sanitation needs by gender

Time: 45 minutes

1: Family members clean their latrines twice a week.

2: Families build child seats in their latrines.

3: Households with members of legal age or disabled build handles in latrines to make it accessible to all.

4: Health promoters encourage members of the community to use the latrines, or build one if one does not have one.

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Materials:

-Paper

-Markers

-Fabrics

Dynamic:

Game: Create a song about cleaning the latrines in groups (3).

** Game changed. **

Dynamic:

Game: Bathroom Musical Chairs- 5 minutes

Ask participants to form chairs in a circle

While music is playing, the players will have to walk around the chairs and pretend that they have to use the bathroom.

Once music stops, they all must compete to sit in a chair, and the person without a chair loses.

The game continues until the last person remaining wins.

Behavior Change Lesson:

- Ask the audience if they remember from the previous lesson. Ask:" Why is it important for everyone to use a latrine? "
- Once the importance of using a latrine is established, Say:" Once a latrine has been built, it certainly improves the sanitary quality of a house; however, if it is not maintained properly, there can be many varieties of health problems.
- Then ask:" How do you (is) maintain a latrine?"

If the participants do not mention the following maintenance actions, address:

- At least once a week, clean the seat / seat toilet and the floor with soap and water or ashes
- Take into account the deterioration of the installations and the need for repair, repair leaks / etc. / holes immediately.
- Remove any type of puddles near the structure / latrine, refill the area / puddle with dirt or ashes to prevent mosquitoes from reproducing there.

- Clean around the area to avoid insects, rodents, snakes and other animals.
- Close the latrine door to prevent animals from entering.
- After using the latrine, place a lid on the toilet or a bench to prevent the entry of flies / mosquitoes.
- After cleaning the latrines, throw lime or manure into the hole, which will treat the waste and prepare it for environmentally safe disposal and to make it smell better.
- Are there people in your community who do not have access to latrines?"

If not mentioned, ask about children who are short or small to sit in a seat for adults and the elderly and disabled who may have problems using the latrines.

How can we improve access to latrines?

- In addition to the answers, be sure to recommend that seats be built for children and handles for the elderly." Reinforce the importance of everyone using the latrine.

Activity

- Preparation:
  - Print or draw 2 of the following images: a man, a woman, a latrine under construction, a latrine is cleaning, a latrine seat, a person cleaning outside the latrine, a person helping the children use the bathroom, the repair of the latrine ... etc.

Game:
- Divide into groups of 2.
- Present 1 photo of a man and 1 photo of a woman in front of each team (4 photos in total)
- On each team, give a copy of each of the images that involve the construction and maintenance of the latrines.
- Ask the participants to deliberate and place the images they received in the man, if the men usually do the task shown in the image, or the woman, if the women usually do the task shown in the image.

Discuss possible barriers and solutions -15 minutes

"We have discussed several tasks that are important for the maintenance of a sanitary latrine. In the last activity, you have identified that each home usually completes each task, so, when you go to the community and visit homes, be sure to deal with the people responsible for the behavior you are trying to encourage. For example, if a latrine has a

structural problem, if possible, talk to the head of the family because the men build the latrines."

"When we were making our observations, we realized that most latrines, even in homes with older people, do not have control bars to help them use the latrine."

"Would railing help the elderly use the latrine?"

"What prevents members of the community from adding a handrail to latrines?"

"How can we deal with that problem?"

"To mention that it is important to maintain / clean handlebars on a regular basis."

Appendix 6: Lesson Plans

MPH Foundational Competencies

Evidence-based Approaches to Public Health

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice

Public Health & Health Care Systems

5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels

Planning & Management to Promote Health

7. Assess population needs, assets and capacities that affect communities' health
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
9. Design a population-based policy, program, project or intervention
10. Explain basic principles and tools of budget and resource management
11. Select methods to evaluate public health programs

Policy in Public Health

12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes

14. Advocate for political, social or economic policies and programs that will improve health in diverse populations

15. Evaluate policies for their impact on public health and health equity

Leadership

16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making

17. Apply negotiation and mediation skills to address organizational or community challenges

Communication

18. Select communication strategies for different audiences and sectors

19. Communicate audience-appropriate public health content, both in writing and through oral presentation

20. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice

21. Perform effectively on interprofessional teams

Systems Thinking

22. Apply systems thinking tools to a public health issue

Appendix 7: MPH Foundational Competencies