Technical Assistance to DFID Funded Trachoma Partners and FMoH

Desk review: Best practices in behavioral change and WASH for control of NTD

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Contents

1 Introduction

Background

Neglected Tropical Diseases (NTDs) affect more than a billion people across 149 countries, with many at risk of suffering from more than one NTD. NTDs are "a proxy for poverty and disadvantage", and are more prevalent in rural, vulnerable and marginalized populations. The same populations who have the least access to sustainable and affordable water supply and sanitation and are thus highly exposed to disease [*WHO*, 2015]. This leads to a **vicious cycle of poverty and disease** and adds a substantial burden on already stretched health systems. Affected individuals and their families can incur catastrophic health expenditure, and are thus less economically productive. E.g., the global economic cost of trachoma due to lost productivity was estimated to be US$ 5.3 billion annually [*Frick et al.*, 2003]. On the other hand, every dollar invested in water and sanitation is estimated to result in a return of over five dollars in health benefits [*Hutton*, 2013].

Consequently, the Federal Ministry of Health (FMoH) prioritized the treatment of NTD on its National NTD Masterplan. The masterplan's vision is an NTD-free country, to be achieved via the implementation of an integrated NTD strategy for the control and elimination of NTDs in Ethiopia. To achieve its goal, the FMoH defined four strategic goals: (1) Strengthen government ownership, advocacy, coordination and partnerships; (2) Enhance result-oriented planning, resource mobilization, and financial sustainability of national NTDs programs; (3) Community empowerment, scale-up access to NTD interventions, and strengthen existing health system; and (4) Enhance NTD monitoring and evaluation, surveillance, and operational research. Thus, the planning of further NTD interventions and WASH-NTD coordination should be in-line with these objectives.

The traditional approach to NTD treatment was a vertical one, treating the disease via chemotherapeutic and surgical intervention. However, this approach often provides an incomplete solution since it does not address the root-causes of the disease, and often fails in sustainable disease control and prevention. Moreover, even horizontal interventions, addressing behaviors that hinder the disease elimination, are often inefficient due to poor design and lack of sustainability. For example, the SAFE strategy (Surgery, Antibiotics, Facial cleanliness, and Environment) is the methodology adopted for Trachoma elimination by the World Health Organization in 1996 (http://www.who.int). The objective SAFE's *S* and *A* elements is to treat the disease, while the *F* and *E* elements aim at reducing Trachoma transmission, and creating an enabling environment with improved access to water and sanitation.

S&A elements have been widely and successfully applied in Ethiopia and worldwide. However, even though the application of F&E elements is growing steadily, their implementation methods result by significant gaps between the desired (sustainable disease elimination) and obtained outcome. That is, most F&E interventions focus on disseminating information regarding trachoma transmission and prevention. However, knowledge alone does not typically translate into a sustained behavioral change, and there is a lack of F&E interventions that bring about a sustainable behavioral change in programs for Trachoma elimination [*Delea et al.*, 2017]. Thus, F&E methodologies, and, on a broader perspective, any other behavioral and environmental change mechanism, should be critically reviewed with respect

to its ability to induce an effective and sustainable behavioral change, and planned activities should be designed to accommodate a change that will ultimately lead to a sustainable disease elimination.

Desk review goals and objectives

The goal of this desk review is to survey elements and methodologies that will support Ethiopia's national goal of eliminating Neglected Tropical Diseases (NTD). The elements of interest are closely related to the F&E elements of the SAFE strategy for Trachoma elimination. However, the integrated approach for NTD elimination, adopted by the Federal Ministry of Health (FMoH), directs to a broader perspective that facilitates the elimination of several NTDs simultaneously.

The review is constructed along two main elements: creating a meaningful and sustainable behavioral change (BC), and promote an enabling environment that support this behavioral change, via proper WASH interventions. These two elements are to work in concert in order to create an effective NTD elimination program. Therefore, the focus in the review is on NTD-WASH collaboration rather than stand-alone WASH projects.

The desk review will be answering two key questions:

1. What could be learnt from past community health interventions for disease prevention in Ethiopia?
2. What could be learnt from past community interventions for NTD elimination globally?

It is important to stress out that the purpose of this review is to examine elements that could strengthen the impact of ongoing and planned control programs in Ethiopia, rather than to criticize such programs. The review highlights ***implementable*** and ***sustainable*** best practices that are ***relevant to the successful implementation of the program***. Medical treatment and prevention (such as surgery and medications) are excluded from the review.

Report structure

In order to provide a comprehensive review of existing practices and methodologies, the desk review begins with a detailed description of BC methodologies for disease control, including NTDs, along with successful interventions (case studies) conducted in Ethiopia and overseas (chapter 2). The WASH-NTD coordination challenge is addressed in chapter 3. This chapter stresses out the importance of collaboration, provides guidelines for implementation, challenges and mitigation activities, and presents case studies of WASH-NTD collaborations.

2 Behavioral change programs: Methodologies, best practices, successful interventions:

There are various frameworks, approaches and methodologies on how to design and analyze behavioral change (BC) interventions. In this chapter, we will look at a general framework for designing a BC intervention, the Socio-Ecologic Model (SEM), and then move to detailed description of BC methodologies found in academic and non-academic literature such as reports generated by national and international organizations (e.g., CARE, World Health Organization, and UNICEF). In the literature review we have focused on programs that provided tools that could be applicable for the National NTD

elimination program; reach a significant number of beneficiaries (the minimal number of beneficiaries was 5 districts (Zanzibar), estimated as 150,000 people), and those programs that had monitored and proved successes (if this data was available). However, not all programs had measurable results at the time of publication, especially measures of sustainability (for example, a health intervention that requires several years' follow up), and some achievements were challenging to asses quantitatively. This is a limitation of all BC interventions that could be addressed via proper monitoring and evaluation. The best practices were chosen based on their ability to lead to efficient and sustainable program: Leadership and community involvement, collaboration with grassroots organizations, capacity building, public campaigns, and creating an enabling environment via comprehensive interventions. Some of the implemented best practices are tangent to each other or have close ties, but we attempt to provide complete and clear definitions of each intervention. The BC best practices described next are accompanied by case studies of successful interventions applying one or more of these practices. The chapter closes with a discussion on BC intervention challenges and mitigation activities.

2.1 Social Ecological Model (SEM)

The Social Ecological Model (SEM) is a theory-based framework for understanding the multifaceted and interactive effects of personal and environmental factors that determine behaviors, and for identifying behavioral and organizational leverage points and intermediaries for health promotion within organizations. As presented in figure 1, there are five nested, hierarchical levels of the SEM: Individual, interpersonal, community, organizational, and policy/ enabling environment.

Table 1 provides a brief description of each of the SEM levels. The third row of the table provides guidelines for the implementation of each layer within the Ethiopian NTD elimination program. The most effective approach to public health prevention and control uses a combination of interventions at all model levels.
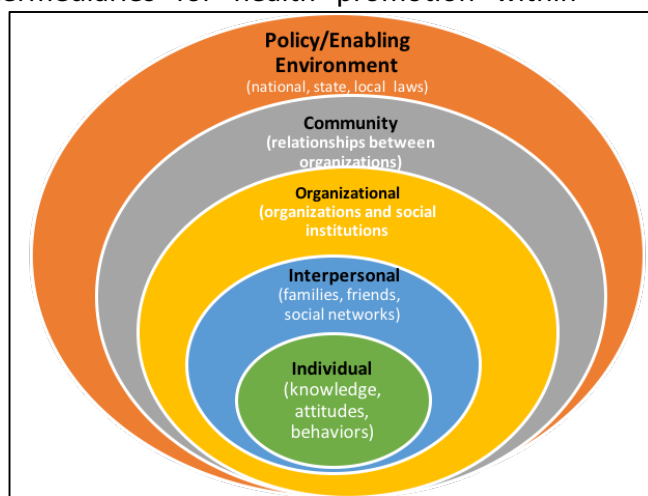
Figure 1. The Socio-Ecological Model

The SEM framework can be used to design a BC intervention, that is, design the appropriate activities that will fall into each of the five layers, or it could be a framework for analyzing a proposed intervention: to examine if it is holistic and sustainable, and to locate gaps that could be filled to improve the intervention.

Table 1. SEM framework layers and guidelines for implementation in the National NTD elimination program [*Fleek*, 2015]

SEM Level	Description	*Implementation activities: the Ethiopian NTD elimination program*
Individual	The individual's characteristics which influence behavior change: knowledge, attitudes, behavior, self-efficacy, gender, age, religious identity, etc.	• Interviews with community members; • KAP surveys and socio, demographic, and economic surveys • Interviews with community leaders
Interpersonal	Influences of family, friends, and peers via formal (and informal) social networks, religious networks, customs or traditions.	• Education directed to the individual's surrounding environment: parents, colleagues, etc. • Media campaigns • Community engagement
Organizational	Organizations or social institutions with rules and regulations that can influence behaviors: churches, health facilities, stores, and community organizations, and rules which may constrain certain behaviors.	• Capacity building to organizations that effect behaviors. For example, religious or labor organizations. • Improved accessibility to services.
Community	Broader social networks surrounding an individual along with community and cultural norms.	• Advocacy • Education • Media campaign to change cultural norms and improve the society's knowledge
Policy/Enabling Environment	Local, state, national and global laws and policies, including policies regarding the allocation of resources and access to healthcare services, and restrictive policies (e.g., high fees or taxes for health services).	• Adjusting rules that effect behavioral change • Advocating agendas for disease prevention • Prioritizing disease prevention policies

2.2. Best practices and related case studies

2.2.1. Policy and leadership involvement

The practice of leadership involvement constituted a fundamental part in all the projects surveyed. At the top leadership level is the government, whose policies and priorities often set the success or failure of the program. The government can support a successful intervention by (*i*) applying proper laws and regulations; (*ii*) defining national priorities for disease control or elimination (e.g., fighting HIV stigma to improve People Living with HIV (PLHIV) accessibility to healthcare services and community acceptance); and (iii) assigning the relevant governmental offices as facilitators of these priorities. Nevertheless,

leadership involvement does not stop at the government-level, but should be present in all relevant levels of the leadership. In Ethiopia, leadership engagement could be regional (states), zonal, or district (woreda) levels, all the way down to community leaders and higher-resolution leadership such as health posts administration or school managers.

Top-down leadership involvement was observed in many of the documented successful interventions. For example, a significant reduction in the maternal death in Ethiopia was obtained by abortion laws reforms and expanding access to safe abortion services (death due to unsafe abortions amounted to a third of maternal deaths). Another example is the Essential Nutrition Actions (ENA) package, initially developed by USAID/Ethiopia and then adopted by the Ethiopian FMoH. The ENA package was then incorporated into the Ethiopian public health system through proper exposure and training of health professionals at different levels of the system.

2.2.2. Capacity building

A successful facilitation of a behavioral change requires a strong capacity building of the program facilitator's abilities. Program facilitators could be health workers, members of grassroots organizations, CBOs, school staff, parents, and other community members that were identified as suitable facilitators. The capacity building should focus on (*i*) ingraining the BC importance in achieving a predefined goal (e.g., reduce a disease burden and thus reduce mortality or improve the population's life quality); (*ii*) motivating the facilitators to implement the program activities, (*iii*) provide a proper and comprehensive education on behavioral change methodologies, the context, and the know-how of carrying out the program activities in a way that stirs the desired behavioral change; and (*iv*) how to maintain the sustainability of the program's achievements. Common practices for capacity building are:

- Workshops and trainings for program facilitators
- Provision of proper educational materials
- periodical meetings that include a monitoring and feedback mechanism that creates on-going

Capacity building includes, in addition, working with different leadership levels. This type of capacity building is often done via designated meetings, seminars, and workshop for government and other high-level officials. The goals of leadership capacity building are to create awareness and understanding of the challenges which led to the BC intervention program, its importance in improving the population's wellbeing, and to engage the relevant stakeholders into actively support the program implementation via promoting a relevant agenda, formulating adequate strategies and policies, and disseminating the need for the program to lower-leadership levels in the community. Case study V below provides an example of a good capacity building, combined with other behavioral change methodologies

2.2.3. Collaborations with community-based organizations

Government and NGOs that attempt to influence a behavioral change are often limited in their ability to keep a continuous and close contact with the program beneficiaries, to motivate the community to act, and to create a sustainable change. These challenges often arise due to lack of on-ground presence, cultural gaps, misunderstanding of the community's needs, and lack of trust from the community.

Community-based organizations (CBOs) have already-established ties with the community, their members often come from the community, and their activities reach many of the program's beneficiaries. CBOs have thus strong organizational presence, established trust with the community, and are able to mobilize significant parts of the community. The close ties and the understanding of the community's unique characteristics enables CBOs to facilitate BC programs to many beneficiaries and to create a significant sustainable change. Thus, CBOs constitute a central pillar for obtaining a sustainable behavioral change in the community.

When establishing a CBO-collaboration, the CBO serves as the program implementer, and the government/regional agency or NGO provide the knowledge, training, capacity building, educational materials, and so on.

Relevant CBOs for BC interventions could be local religious institutes, or any other local organizations that is well integrated in the community, reach many beneficiaries, has strong ties, understand the community's cultural background and needs, and have earned the community's trust and respect. An example for a successful CBO collaboration is given in case studies I and V.

Case Study I: ILO Action against stigma (http://www.unaids.org)

Collaboration with community-based organizations
A program for reducing the negative effects of HIV that was implemented in Oromiya region. The program was led by the Italian government and the International Labor Organization (ILO), but was facilitated via regional agricultural cooperative unions. The agricultural unions have members in over 200 agricultural primary societies and 14 transport associations, and thus not only reach a large number of beneficiaries, but are also able to create a fundamental change in the community's approach to PLHIVs, increase their acceptance, and make them proud members of the community.

2.2.4. Community involvement

The local community is a key player for
a successful and sustainable intervention. Efforts invested in community engagement: taking a role in implementing the program, coming up with their own solutions to the problems, or making them a partner in infrastructure construction and maintenance, often prove to be a wise investment. The main practices to get the community engaged and actively involved are: (*i*) creating a cadre of community volunteers to serve as full or partial facilitators of the program; (*ii*) treating community members as the best experts: involving the community in planning the intervention by suggesting implementable and sustainable solutions; and (iii) creating a model to obtain a community ownership of the processes and infrastructure developed within the program:

I. Community volunteers

Community volunteers can constitute a major part of a BC program, through activities such as conducting educational sessions and disseminating education materials; collecting data for monitoring and evaluation processes; face to face community education on behavioral changes, and so on. Creating a reliable cadre of volunteers holds major advantages:

➢ Keeping disease control and elimination knowledge within the community, thus creating a foundation for a sustainable health program;

➢ Keeping a close relationship with the community via increased presence of program facilitators, beyond the often-limited number of Health Extension Workers (HEWs), NGO volunteers, and other stakeholders;

➢ Expanding the health services provided to the community by carrying out simple activities that contribute to disease control;

➢ Improving M&E via improved data collection: use well-trained community volunteers could fill in that gap and strengthen the HEWs ability to collect the necessary data.

Naturally, achieving these advantages is highly dependent on proper training of volunteers, both on the technical aspects as well as on creating understanding of the importance of carrying the health program and the benefits it will bring to the community.

II. Human-Centered design: Community members as best experts

The Human-Centered Design approach sees community members as experts that know best about workable solutions for their own problems [*Person et al.*, 2016]. The Human-Centered Designed process focuses on the people for which the intervention is designed. The methodology includes three major phases: *Hear*, *Create*, and *Deliver*. The **Hear** stage includes data collection from the community via qualitative interviews and discussions with community members; learn about their current knowledge, attitudes, perceptions, practices, and behaviors; and evaluate their response to new ideas and intervention strategies. In the **Create** stage the intervention is designed as a cooperation between the research team and community members. The co-design can be carried out via workshops with community members (teachers, students, parents, community leaders, religious leaders, etc.). The solutions developed in this way are often desirable, focused on the community's needs, and are feasible within the local context and within the available funding. In the **Deliver** stage, the co-designed interventions are implemented in the community: education programs, events, public campaigns, and so on. Case Study II presents a Human-Centered Design coupled with community involvement practices.

A successful Schistosomiasis intervention was conducted in the Islands of Zanzibar, Tanzania, between November 2011 and December 2013. The objective of the intervention was to achieve a sustainable elimination Schistosomiasis prevalence in school children, whose Schistosomiasis prevalence was over 20%. The key practices for the successful implementation were the application of a Community-Centered Design (CCD) approach, which engages and the local community to take an active role in designing a schistosomiasis prevention and control program that best fits their community, and incorporating WASH activities that create an enabling environment for implementing a sustainable Schistosomiasis elimination. The program was implemented in 30 districts in Zanzibar (each district is approximately 5000 people)

The facilitators of the project were a social science team. The BC process was initiated by *leadership involvement* via brief discovery sessions with influential community **religious and political leaders** to explain the study, gain their permission, and to develop respectful relationships. Data was gathered via KAP surveys, interviews with school-children, teachers, and parents, and structured observations of children's behavior at fresh water sites in and near villages. Based on the data findings, the social science research team initiated two workshops with the participation of 32 community members (e.g., teachers, students, parents, and religious and political leaders) to feedback their findings and create a co-designed behavioral intervention. This *community involvement* led to a set of interventions that were within the reach of the community: (*i*) *Health education*: Develop interactive and effective training materials for primary school and Quran school teachers; annual training for teachers that will serve as trainers to the other teachers in school; (*ii*) *Prevention*: creating a detailed portfolio of safe games, activities, and educational plays for children, that will keep them away from fresh-water infectious sites; (*iii*) *Enabling environment*: accessible male and female urinals made from bricks and cement; and creating a safe laundry zone where children can wash their cloths without standing in the river *Community volunteers*: The desirable and feasible interventions were delivered to the community in collaboration with the teachers and other community members.

III. *Community ownership*

A common challenge in community interventions is to create a sustainable intervention. A sustainable intervention can be an effective, behavior-changing educational program that is delivered to the target population (women, children, or the entire community) on a regular basis, or the construction of sustainable infrastructures and facilities that create a healthy environment in which the obtained disease elimination could be maintained.

There are several obstacles for obtaining a sustainable solution: a solution that does not consider the community's needs and capabilities, lack of community interest and understanding of the solution's contribution to disease prevention, and lack of resources to carry out activities or maintain facilities.

Community ownership is thus a crucial building block to enhance a sustainable intervention. Ownership of the community means that community members have an interest in the project or process, they

understand how it can improve their lives, and are actively involved in implementing the project and maintaining its functioning. Community ownership begins with proper advocacy and dissemination of what the project is, and its importance and relevance to the community wellbeing. Then necessary steps are to build the community's motivation to own the project and to roll it forward, and to create an enabling environment for its activities. In infrastructure development, for example, a community ownership could be created by deciding on priorities, having the community raising funds (even partially) for constructing facilities, or contributing their time and resources to the construction; in behavioral change processes, it is critical that the community will understand the BC importance to their well-being, and thus be motivated to own the process by creating a structure within the community that is responsible to educate the community and see that the messages are digested and that a change does take place.

Optimally, the project or process will be co-designed with the community, which will almost automatically create a degree of ownership and involvement. Case study III provides an example of NALA's model for WASH projects that were carried out in Adwa, Ethiopia, collaboration with the community.

Case Study III: NALA Foundation's model for funding WASH projects in Adwa's urban and rural schools
Community ownership; Enabling environment
NALA initiated a health project for the elimination of Schistosomiasis and Soil Transmitted Helminths (STH) in Adwa, Ethiopia (2014) with the support of the Bill and Melinda Gates Foundation. The project included an educational program in 30 rural and urban schools in the area of the City of Adwa. A preparatory survey of the area showed a gap between existing WASH facilities and those required for the maintaining the achievements of disease elimination. To bridge these gaps, a WASH program was established. The core of the program was a set of low- or no-cost WASH community projects that were proposed by community organizations such as Parent Teacher Associations (PTAs), school Health Clubs, and Health Development Army (HDA). Supplementary WASH projects were conducted via a separate program, in which the schools proposed infrastructure solutions and their required budgets. To fund this projects, a funding program was launched, in which NALA covered 70% of the cost and the school provided the remaining 30% through monetary or in-kind resources. The projects were designed by the schools, each according to its needs. The funding program was implemented the 30 schools, covering projects such as maintaining or setting up hand washing stations and latrines, and maintaining or establishing rain harvesting systems. A WASH expert is working with the schools to ensure the maintenance scheme of the infrastructure.

2.2.5. Public/targeted media campaigns

Many parts of the population, even in distant rural areas, are exposed to one or more forms of media. In the past decades, exposure to media increased significantly due to improved internet and cellular infrastructure. The increased exposure of communities to media campaigns (e.g., radio and TV shows,

internet videos and text messages) makes properly-designed media campaigns an attractive tool for conveying key messages that promote the desired behavioral change.

An example for a highly -effective media campaign is the Sabido method ([www.populationmedia.org)](www.populationmedia.org), which uses long-running serial dramas for radio, TV, and the web to garner a large & faithful following

while at the same time educating on issues of sex, abortion, family planning, and AIDS. The method was implemented in 45 countries in Africa, Asia, and Latin America and obtained proved results in elevating women's status, reducing birth rates, and improving women's and children's health. In Amhara, for example, use of modern family planning methods went from a baseline of 14% to 40% among listeners vs. 25% among non-listeners [*African Union*, 2013]. Case study IV provides another example for an effective, nation-wide, messaging campaign, based on radio broadcasts.

Case Study IV: Enhancing community knowledge and health behaviors to eliminate blinding trachoma in Mali using radio messaging as a strategy [*Bamani et al.*, 2013]
National leadership, Media campaigns

Mali's National Blindness Prevention Program adopted the SAFE strategy, and was facilitated via MDA campaigns, surgical camps, latrine building, health education and behavior change communication. The behavioral change component was supported by a national radio broadcast. The messages focused on promoting trachoma awareness, social mobilization and behavior change communication (educational information such as disease manifestation, transmission and specific behavioral steps to prevent and eliminate trachoma). The broadcasting took place in five regions (Kayes, Koulikoro, Mopti, Segou and Sikasso), via 100 radio stations, reaching millions of people. The results were based on an end-line survey conducted on in 2011 on 391 adults (most of them were females) and 687 children. 91% reported listening to the radio. The results showed a high level of knowledge: from 64.3% of the respondents reporting the root causes of disease to 86.6% reporting the visual consequences of trachoma. 49.4% reported learning about Trachoma from the radio. The behavioral change assessment showed that 65.5% reported face washing of children at least twice per day, 93.8% reported disposing feces in a latrine, and 66.4% reported children using latrines. 95.5% and 83.7% of children did not show signs of ocular and nasal discharge, respectively, and 82.8% did not show signs of either ocular or nasal discharge.

2.2.6. Enabling environment

The great effort invested in creating a behavioral change should be supported by an enabling environment for the community. That is, the BC program should include a component that oversees that the conditions that are required in order for the community to change their habits and practices are provided. For example, a desired behavioral change is to increase the percentage of HIV-positive people that obtain retroviral treatment and adopt healthy sexual behavior. This requires both accessibility to
healthcare providers, and mitigation of the negative HIV impacts, such as stigma and discrimination, that often inhibit patients from obtaining treatment.
In trachoma prevention and control, facial cleanliness is a desired outcome. This requires the availability of water and soap in accessible sites. However, often these basic conditions are not available, and the
intervention should tackle this issue and provide the means for overcoming such gaps. Solutions need not be expensive ones, and often they could be community-based solutions, such as collecting money
for soap and establishing water delivery to a central point by community members or a contracted provider. In general, WASH is a common component in creating an enabling environment, making
NTD-WASH collaboration of utmost importance. This will be touch upon more thoroughly in chapter 3 next.

Case Study V: Improving Maternal and Newborn Health Care Delivery in Rural Amhara and Oromiya, Ethiopia [*Sibley et al.*, 2014]

Leadership; Capacity building; Community involvement; Media campaigns

The Maternal and Newborn Health in Ethiopia Partnership (MaNHEP) integrates several effective behavioral change mechanisms, for improving maternal and newborn health. *Leadership* The project operated under the leadership of the Ethiopian FMoH and the health bureaus and of Amhara and Oromia, and was aligned with 3 key national policies: *Health Sector Development Plan IV*; *National Reproductive Health Strategy 2006-2015*; and *Road Map for Accelerating the Attainment of the Millennium Development Goals Related to Maternal and Newborn Health in Ethiopia 2011-2015.* The goal of the project was to provide the core package of community maternal and newborn health (CMNH) care to "every woman, in time, every time". MaNHEP's 3-pronged intervention included community- and facility-based community maternal and newborn health training, continuous quality improvement, and behavior change communication. The first component was applied by combining *community involvement* and *capacity building*: Relevant community structures, such as community health development agents (CHDAs), and traditional birth attendants (TBA) were identified as potential facilitators of the package, teams composed of HEWs, CHDAs, and TBAs were formed, and the facilitators went through CMNH package training. This training allows to increase the per capita availability of healthcare providers (e.g. HEWs cover ~2500 persons, whereas CHDA cover 30-50 households). The successful implementation led to increased community trust, which increased the number of women seeking health services during pregnancy and the following neonatal period. Quality improvement was obtained by forming quality teams of community stakeholders (e.g., Kebele leaders, priests, and women association leaders) that worked to generate ideas on how to improve pregnancy identification, antenatal care registration, CMNH family meeting attendance, labor and birth notification, and postnatal care follow-up. Behavior change communications, were delivered through culturally appropriate, professionally produced films, radio and TV dramas, songs, and poetry contests, with the aim of increasing the community's demand for improved care and services and to promote teamwork among the HEWs, CHDAs, and TBAs.

2.3. Challenges and mitigation activities

Changing a community's behavior is a not a trivial task, which often requires a great deal of effort in order to consider the challenges ahead and the mitigation activities that will resolve them. Much of the literature do not include a thorough analysis of challenges and mitigation activities, however, several major challenges, that are relevant to Ethiopia's national goals could be identified, and are detailed below with their respective mitigation activities.

1. **Coordination between different stakeholders**

   National programs often involve coordination of many stakeholders, on various levels: different federal offices, national-level NGOs, regional offices and regional NGOs, local community structures, and so on.

   Mitigation

   The basis for mitigation of coordination challenges is to **work under the same set of goals and objectives**. When stakeholders are motivated to work towards the same goal, they are prone to be more motivated to cooperate and use the coordination mechanisms established.

   - Create **mechanisms for sharing** information, coordination of activities, on all levels: national,

regional, zonal, etc., and mechanisms for sharing information between levels (national-regional, regional-woreda);

- Use **shared**, standardized **databases**, such as NTD prevalence, water points, and WASH facilities;
- Use a **joint set of monitoring indicators**: which reflect the common goals and is agreed on by all the participants;

2. **Lack of expertise on behavioral change**

   Some of the behavioral change practices detailed herein require a profound professional expertise. For example, the Human-Centered Design (section 2.2), requires a team of social science professional for training the teams on qualitative research. Using external expertise (e.g., from academic institutions) may limit the program's sustainability and scaling up opportunities.

   Mitigation

   Expertise gaps could be tackled by either creating a local body of knowledge. This cadre could be established by a profound training of local scholars or professionals on BC methodologies. The training could be conducted by external experts, if local ones are not available. However, it is of utmost importance to make sure that the training is well-designed to enable the trainees to disseminate their knowledge via training of additional local stuff.

3. **Community engagement**

   It had been recognized since the 1970's that "a sustainable change at the community level cannot be achieved without real commitment and involvement of the community" [*WHO*, 1997]. The question, however, is how to engage the community in the program.

   Mitigation

   Adopting a participatory approach is an effective practice for engaging the community in the process. The underlying principal of participatory approaches is that the best way to promote a change is to offer communities with ways in which they can take more control of their development. In order to do so, participatory approaches include the following components:

   - **Understanding the context:** mapping and understand the cultural background of the community, their set of beliefs (especially regarding the disease, its driving forces, and outcomes), their traditions, and so on, and incorporate these understandings into the program design;
   - **Create a high-level of personal involvement** in the decision-making process: empower the community to take part in designing the process, for example, by asking for a feedback and suggested solutions from community leaders, school teachers, and child club members.
   - **Invest in proper education:** create a profound understanding in the community of the disease symptoms, risks, prevention, while respecting their traditions and beliefs. **Learning** should be fun, and often best-practiced via group work;
   - **Relay on local human resources:** the community is often the best facilitator for creating a normative shift: use local organizations and structures, community role models, etc., and make sure that they are motivated to participate;

For example, see the SARAR[1] method, or PHAST[2], applied for WASH behavioral change programs;

4. **Human resources: Shortage pf program implementators**

   Shortage of health and education stuff is often a barrier in reaching a substantial number of community members, and creating an impact.

   Mitigation

   The human resources gaps could often be bridged by relaying on local organizations and community volunteers to facilitate the program: Women Development Army (WDA), priests, schoolteachers, and school health club members, are good examples for local resources that can support the program delivery and sustainability.

5. **Monitoring & Evaluation**

   Unlike the results of mass drug administration or facility construction, behavioral changes are difficult to measure and often involves qualitative research, requiring a high-level of expertise. In addition, maybe due to these difficulty M&E methods are not properly integrated from the design stage, and are thus difficult to implement later.

   Mitigation

   - **Design and incorporate the M&E mechanisms from day 1** of the program;
   - **Consult** literature and experts on **best M&E practices** and select those that can deliver the project objectives;
   - Use **indicators** that are **accepted by all stakeholders**;
   - Build **strong mechanisms for M&E data collection, storage, dissemination, and analysis**. The mechanisms should address the challenges involved with these activities, such as over-loaded HEWs, confusing forms, difficulty to deliver results to higher-levels, and so on;

6. **Sustainability**

   Sustainability is a major concern in any project, and the challenge of maintaining the behavioral change achieved on the long-run, after the intervention is completed, should be properly discussed and addressed in the project's design and implementation.

   Mitigation

   Several aspects of sustainability are addressed via the mitigation actions described above, and are inherent in many of the BC methodologies in this chapter (e.g., education, relaying on local stuff and community members, and motivating the community to own the process and help themselves). However, the most important thing is to keep the sustainability challenge in mind when designing the program, and to establish an M&E mechanism that will follow up on the long-run achievements.

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[1] SARAR stands for Self-esteem, Associative strengths, Resourcefulness, Action-planning, and Responsibility. It is a participatory approach methodology which engages the community by offering them ways to take more control of their own development.

[2] Participatory, Hygiene, and Sanitation Transformation. It is a participatory approach, based on the SARAR approach, designed to promote hygiene, sanitation, and community management of water and sanitation facilities.

3 Guidelines, challenges and mitigation activities: WASH-NTD coordination

3.1. Introduction

The global WASH and NTD elimination goals, are clearly outlined in targets 6 and 3.3 of the 2030 Sustainable Development Goals (SDG) framework: "Ensure availability and sustainable management of water and sanitation for all", and "End the epidemics of AIDS, tuberculosis, malaria and NTDs […]", respectively [*UN*, 2015]. The World Health Organization (WHO) increased the effort for NTD elimination through its roadmap for intensified control or elimination of NTDs by 2020 [*WHO*, 2015]. One of the five key interventions set out in the roadmap is the provision of safe water, sanitation and hygiene. NTD prevalence and poor access to WASH contribute to a vicious cycle of poverty and disease, and adds a substantial burden on over-burdened health systems. WASH and NTD elimination share common goals (Figure 2), and coordination between WASH and NTD actors could contribution to a root-level NTD elimination, while making sure that WASH investments reach vulnerable populations that are most in need for it.
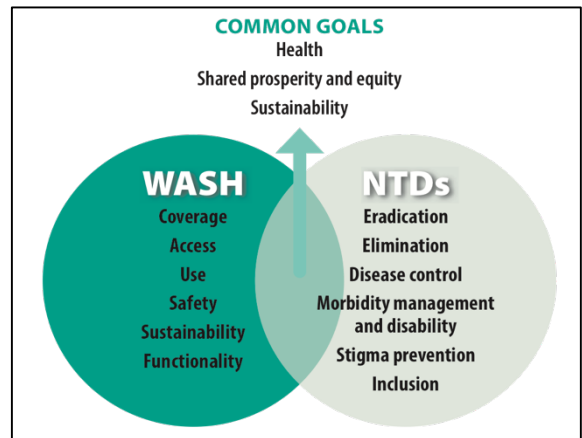

Figure 2. Common ground for WASH and NTDs collaboration

There is a close link between poor access to WASH and NTD prevalence. Table 1 outlines the linkage between the three most effected NTDs (Trachoma, STH, and Schistosomiasis) and WASH components, making this link highly visible.

Another observation from the table is that WASH does not focus only on infrastructures (e.g., latrines and water supply) but requires a great effort on behavioral change. That is, WASH is in fact composed of two components, hardware and software, that have to work in concert for creating a successful WASH implementation: *Hardware* includes the construction and maintenance of infrastructures such as latrines, water conveyance systems, improving water safety, hand washing stations, rain harvesting, and so on. *Software* encompasses hygiene activities and behaviors that uses these facilities: hand and face washing, using soap, using latrines, and using only safe drinking water.

Table 2. *The link between WASH and NTDs (based on [WHO, 2015])*

NTD	Goal (WHO)	Role of WASH
Trachoma	Elimination	F&E elements of the SAFE strategy: Face washing (*Facial cleanliness*) removes eye discharge thus reducing transmission by *Musca sorbens* flies, fingers and fomites, and requires access to water. Proper sanitation (*Environment*) for disposal of excreta can reduce fly populations.
Schistosomiasis	Elimination	Improved sanitation across the entire community will prevent worm-eggs contaminated faeces and urine from reaching surface water, thus reducing or eliminating transmission. Protecting freshwater from animals/animal waste may contribute to contamination as well.
STH (intestinal worms)	Intensified control	Prevention of open defecation, and adequate sanitation facilities and faeces management, will prevent worm eggs from reaching soil, food or hands. Improved hygiene practices such as hand washing with soap, beyond the household level (e.g., in schools) reduces transmission through contaminated hands.

3.2. Tools for a successful WASH-NTD coordination

The WHO has set a global vision of "accelerated and sustained achievement of the NTD roadmap milestones, particularly among the poorest and most vulnerable, **through better-targeted and joint WASH and NTD efforts**" by 2020.

To obtained an effective WASH-NTD coordination, four strategic objectives (SO) were defined:

- **SO1:** Increase awareness of WASH-NTD coordination co-benefits;
- **SO2:** Highlight gaps, target investments, and track progress via M&E of WASH and NTD programs;
- **SO3:** Strengthen evidence on effective WASH interventions for NTD elimination;
- **SO4:** Create collaborative programs of WASH, health, and NTD actors.

The following table details the recommended tools for achieving each strategic objective. These tools should be applied when designing both WASH and NTD interventions, and when establishing WASH-NTD coordination mechanisms.

Table 3. The link between WASH and NTDs (based on [WHO, 2015])

Strategic objective	Tools/Actions
SO1: Increase awareness of WASH-NTD coordination co-benefits	• **Identify synergies** across NTDs, and between NTDs and WASH • **Strengthen platforms** for sharing knowledge and increasing collaboration • **Improve awareness** about NTDs and opportunities provided by joint interventions among professional communities within and beyond WASH and NTDs
SO2: Highlight gaps, target investments, and track progress via M&E	• **Formulate** cross-cutting **program M&E systems** including **standardized and comparable success indicators** • Collect **higher quality and disaggregated data**
SO3: Strengthen evidence	• Define an agenda for applied practical operational research on effective implementation • Embed guidance on joint WASH-NTD coordination, and disseminate standards and guidelines into policy and practice
SO4: Create collaborative programs	• Support the development and strengthening of governance and institutional arrangements that enable collaboration • Joint **use of existing datasets and reports** between stakeholders and across sectors to track progress and inform decision-making at sub national, national and global levels

3.3. Case studies: WASH programs and WASH-NTD coordination

This section presents effective WASH programs that placed an emphasis on the impact of WASH interventions on NTD prevalence. Nevertheless, documented materials on global and holistic WASH-NTD coordination, as outlined by the WHO report, are rather limited if non-existing. The literature survey hints that WASH programs that considered NTD prevalence did not necessarily establish strong coordination with NTD actors, and the NTD prevalence was a measured for the success of the program rather than its driving force. Three case studies are presented: (i) A global WASH solution for schools in Nepal; (ii) Nudging Handwashing among Primary School Students in Bangladesh; and (iii) design and implementation of participatory hygiene and sanitation transformation (PHAST) to control STH infections in Uganda.

CASE STUDY I: Sanitation Revolution Through School Children: A Case Study Of School Sanitation and Hygiene Education Program [*UNICEF*, 2001]
The high disease rate in rural Nepal, resulting from poor hygiene and sanitation, placed an enormous cost on its population, in terms of mortality and morbidity rates. As a result, the government of Nepal adopted the National Sanitation Policy and Guideline, which prioritizes sanitation as an integral part of the country's development strategy. Consequently, UNICEF Nepal established a School Sanitation and Hygiene Education (SSHE) program in the rural area of Bhasi village (Eastern district), with a focus on Shree Bhadgaun Sunwari High School. The motivation for working in the district was the high level of interventions of related agencies, and good collaboration with the Village Development Community (VDC).

The SSHE program was based on a well-defined hierarchy, as described in Figure 2. The *district stirring* **committee (DSC)** is the program initiator, responsible for the overall policy formulation, monitoring and supervision of the program; Various NGOs and Community Based Organizations (CBOs) supported the SSEH implementation; and the *School Management Committee (SMC)* served is a liaison between the community and the school. The backbone of the program was the Child Club (CC) at the school, it was motivated to act via the SMC, and was an instrumental driving force in raising the students' interest in better sanitary practices.

Figure 3. SSEH structure at Bhadgaun Sunuwari High School

The major success factors of the SSEH program were:

I. **Community Participation:** active participation of community leaders and inhabitants, which materialized via motivated parents, sanitation motivators and volunteers. Local NGOs, CC, and school teachers contributed greatly to mobilize the community members for better sanitation practices and adoption of improved facilities;

II. **Coordination between Line Agencies:** agencies working in the district have extended their full cooperation, and their available resources were properly managed through DSC coordination;

III. **Clarity on Roles and Responsibility**: of each partner and stakeholder;

IV. **New Approach by the Child Club:** The CC's sub-committees were remodeled to better accommodate the SSEH project, committee members were trained accordingly, and supervised by the SMC and CC leaders;

V. **Fundraising:** the CC managed to collect 2 Rs. from each club member, and increased its funds by lottery. The money collected was used to enhance sanitation activities within the school as well as in the village; Additional funds were provided by the VDC for the purpose of constructing new latrines;
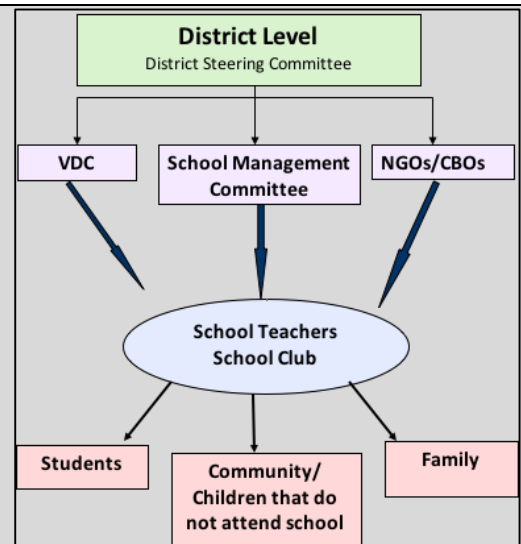

CASE STUDY II: Behavior Change without Behavior Change Communication: Nudging Handwashing among Primary School Students in Bangladesh [*Dreibelbis et al.*, 2016] Nudges are environmental cues engaging unconscious decision-making processes to prompt behavioral change. An inexpensive set of nudges to encourage soap handwashing after toilet use were developed, and applied in two primary schools in rural Bangladesh (220 and 514 students in each), along with infrastructure improvements. Infrastructure improvements included the construction of a dedicated washing station, and provision of soap. Two nudges were applied: (1) paving pathways with bright colors that connected the latrines to the handwashing station; and (2)

Figure 4. Paved paths to handwashing stations with colorful foot and handprints

painting footprints on the footpaths which guide students to the handwashing stations, along with handprints on station (Figure 4). The baseline handwashing with soap was 4%, and increased to 68% the day after nudges were completed, and to 74% in week 2 and 6 (post intervention).

CASE STUDY III: Design and implementation of PHAST as a strategy to control soil-transmitted helminth infections in Luweero, Uganda [*Dumba et al.*, 2013]

Participatory hygiene and sanitation transformation (PHAST) is a strategy for empowering the community to manage their own water and to control sanitation-related diseases [*WHO*, 1997]. The strategy builds on people's innate ability to address and resolve their own problem, and it does so by promoting health awareness and understanding that leads to environmental and behavioral improvements. The PHAST strategy tools include: stimulating community participation, training of extension workers, and using graphical materials adjusted for the community's traditions, beliefs, and practices, coupled with strong M&E tools for continuous improvements. 19 villages participated in the program. PHAST strategy was implemented via triple education sessions to parents and children guardians, followed by revisits to the households to enforce the what had been discussed in the educational session via an open discussion on the household sanitation and hygiene status its planned hygiene and sanitation activities. The intervention was coupled with Albendazol treatment. STH prevalence at baseline (727 children) was 26.7%, and was reduced to 16.5% after the PHAST intervention.

3.4. Challenges and mitigation activities to WASH-NTD coordination

A major barrier for increasing the level of WASH-NTD coordination is being crossed these days, by acknowledgement of leadership of the importance of this coordination. This acknowledgement begins with the WHO, and is disseminated into governments' policies (such as the Ethiopian Government Health Sector Transformation Plan) and international NGOs' agenda. At the ground, levels, several challenges arise for an effective WASH-NTD coordination:

➢ **Knowledge gaps:** Often NTD organizations do not hold the same level of WASH expertise and vice versa: WASH programs are often implemented without consideration of the regional NTD burden, or evaluated in terms of their impact on disease reduction. This implies that the two actors do not operate under the same set of goals [Savage and Velleman, 2012]. To bridge this gap, **a joint goal and joint objectives** should be set (e.g., equity and reducing poverty), and a **pragmatic approach for collaboration** should be adopted, in which vertical NTD programs are shifted towards a horizontal approach that integrates WASH activities via the health and education sectors, and WASH actors operate under the mutual goals defined, and divert their resources towards projects that have a substantial effect on NTD control.

➢ **Lack of information sharing and coordination: NTD** prevention and control programs target areas where the disease is endemic, and the population is highly vulnerable, delivering treatment to the 'poorest of the poor'. However, the major progress in WASH access has occurred in the middle and upper wealth quintiles in developing countries [WHO and UNICEF, 2012]. Thus, improved access to water and sanitation is not delivered to the most vulnerable populations. This gap could be bridged by working towards equity and inclusion in WASH, sharing information on disease prevalence and water point mapping data, and making sure that those with the highest disease burden and the poorest access to WASH are receiving interventions of both.

➤ **Process-based interventions:** Process-based, program-implementation approach to both NTD and WASH interventions lead to poor sustainability of the outcomes. However, making a shift towards Service Delivery Approach (SDA) and a sustainable behavior change in WASH access and NTD prevention, and the integration of WASH activities in NTD control and elimination program will create sustainable, long-lasting interventions.

4 Summary and Conclusions

The goal of this desk review is to provide useful tools and guidelines to support Ethiopia's national goal of NTD elimination. The tools are divided into behavioral change methodology, and improving WASH-NTD coordination, following the global community's agenda of strengthening WASH-NTD collaboration to facilitate the WHO's roadmap for intensified control or elimination of NTDs by 2020.

The behavioral change methodologies included leadership involvement, community engagement, collaboration with community based organizations, capacity building, media campaigns, and enabling environment. These methodologies were described here separately. However, as was evident from the case studies provided, successful interventions rarely apply behavioral change methods as a stand-alone, but rather as a combination of methods that provide a holistic solution. Moreover, recent advances in WASH application places a growing emphasis on its behavioral change component (e.g., using latrines and hand washing stations), thus, the provided BC interventions are applicable to WASH actors as well.

The importance of WASH-NTD coordination cannot be overestimated. The review provides the WHO's vision and strategic objectives, which provide tangible guidelines on how to establish or improve the coordination between the different actors.

The Ethiopian government ONE WASH initiative, which is a joint collaboration of the Ministry of Water, Irrigation and Energy, the Ministry of Health, the Ministry of Education, and the Ministry of Finance and Economic Development. Taking advantage of the FMoH representation in the ONE WASH program to strengthen collaborations at federal level, will create a strong basis for NTD elimination via strong WASH-NTD collaboration. Nevertheless, the agenda for close WASH-NTD coordination should permeate to the lower leadership levels (regional, zonal, woreda, etc.) in order to guarantee its successful implementation.

There are major challenges involved in both creating a behavioral change and establishing a WASH-NTD coordination. Nevertheless, proper design of NTS programs on all management levels, which tackles these challenges, apply proper M&E mechanisms and WASH-NTD coordination, can mitigate these challenges and lead to a successful program implementation.

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