

Reducing Open Defecation Through Community-Led Total Sanitation in Fort Dauphin, Madagascar: A Case Study

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ABSTRACT

Globally, an estimated 4.5 billion people lack safe water and sanitation services. In Madagascar, open defecation is particularly commonplace, with nearly half of the population practicing it. Construction of latrines alone is often insufficient in reducing this number, as availability does not mean the latrines will be used by the community. Community-Led Total Sanitation (CLTS) is an approach which aims to reduce the prevalence of open defecation by catalyzing community action towards increasing use of latrines and other personal hygiene behaviors. This case study evaluates the hybrid-CLTS approach implemented by SEED Madagascar in Fort Dauphin, Madagascar, between 2014 and 2017. Specifically, the intervention's impact on sanitation and hygiene behavior outcomes, and health outcomes are investigated. The report concludes that this intervention is a successful example of adapting a CLTS approach to an urban context where open defecation practices are driven by a complex set of traditional and cultural beliefs. However, significant challenges must be overcome to support such an approach, including ensuring adequate stakeholder engagement, sustainable financing, and broader Water Sanitation and Hygiene (WASH) strategies. Recommendations include fostering partnerships with other organizations, integrating participatory planning approaches, and promoting sustainable sanitation entrepreneurship.

Introduction

Lack of access to safe water, sanitation, and hygiene (WASH), is a significant issue in many low- and middle-income countries. While improving WASH for all is one of the 17 Sustainable Development Goals (SDGs), there is still an estimated 4.5 billion people lacking safe services (1). In 2015, open

defecation was practiced by more than 892 million people worldwide. According to the WHO/UNICEF Joint Monitoring Program (JMP), open defecation (defined as defecating in fields, surface water, or other open area), is the least safe sanitation alternative (2). The practice has been linked to increased incidence of diarrheal

diseases and poor health indicators such as stunting and is thought to be a limiting factor for the achievement of other SDGs, such as ending hunger and poverty, improving gender equality, and ensuring an inclusive and quality education (3, 4).

Increasing access to latrines alone is not sufficient to reduce the incidence of diarrheal diseases and fecal exposure if usage is inadequate (5). The Community-Led Total Sanitation (CLTS) approach recognizes this limiting issue and has become increasingly popular for WASH management and improvement. Since its creation by Dr. Kamal Kar in Bangladesh, CLTS has been implemented in up to 60 countries across the south and east Asia, Latin America and Sub-Saharan Africa (6). The approach aims to facilitate community actions against open defecation by using triggering language and activities, forcing retrospection regarding hygienic behaviors, and identifying natural leaders within the community. This approach differs from other interventions by focusing on inputs of all community members rather than depending on subsidies (7). This bottom-up approach showed potential to improve sanitation, especially in contexts where multiple social and behavioral factors intervene to influence participation, compliance, and maintenance of the infrastructure (8). WaterAid, UNICEF, the World Bank, and other non-governmental organizations (NGOs) endorsed the potential of CLTS as an effective, sustainable, and empowering initiative (7).

Madagascar ranks among the worst countries in the world in terms of access to safe water and sanitation (9). Half of Madagascar's population lacks access to safe water, and only 12% have access to improved sanitation facilities (9). Unfortunately, improvement in these areas has been slow. In 2015, an estimate of 44% of the population practiced open defecation, equivalent to more than 10 million people, with an increase of 0.4% per year between 2000 and 2015 (4). In 2017, an estimated 92.5% of Malagasy (citizens of Madagascar) were using unsafe or unimproved latrines (10).

Over 33% of Malagasy live in urban settings, and an estimated 75% live in slums. In 2008, 89.6% of the population living in urban centers in Madagascar, excluding Antananarivo, used unimproved sanitation, and 15.5% practiced open defecation (11). Considering that a majority of the increasing urban population in Madagascar lives in slums, it is crucial to address the issue of sanitation with an innovative and integrated approach (12, 13). Despite being mainly implemented and assessed in rural communities, inclusive and participatory interventions such as CLTS offer important advantages for heterogeneous and complex urban areas where poor, middle- and rich-income groups may be present (14). Therefore, this case study aims to review a completed intervention, inspired by the CLTS approach, in the urban area of

Fort-Dauphin between November 2014 and April 2017. The goal is to determine whether Sustainable Environment, Education and Development (SEED) Madagascar, through the Project Malio, was effective to successfully improve health and reduce open defecation practice among permanent residents in Fort Dauphin, Madagascar.

BACKGROUND

The Population of Fort Dauphin, Madagascar

Madagascar is divided into regions, districts, municipalities, and fokontany. The latter can cover hamlets, neighborhoods, villages or commercial and uninhabited area, and are managed by the fokontany leader who is appointed by the district leader (15, 16).

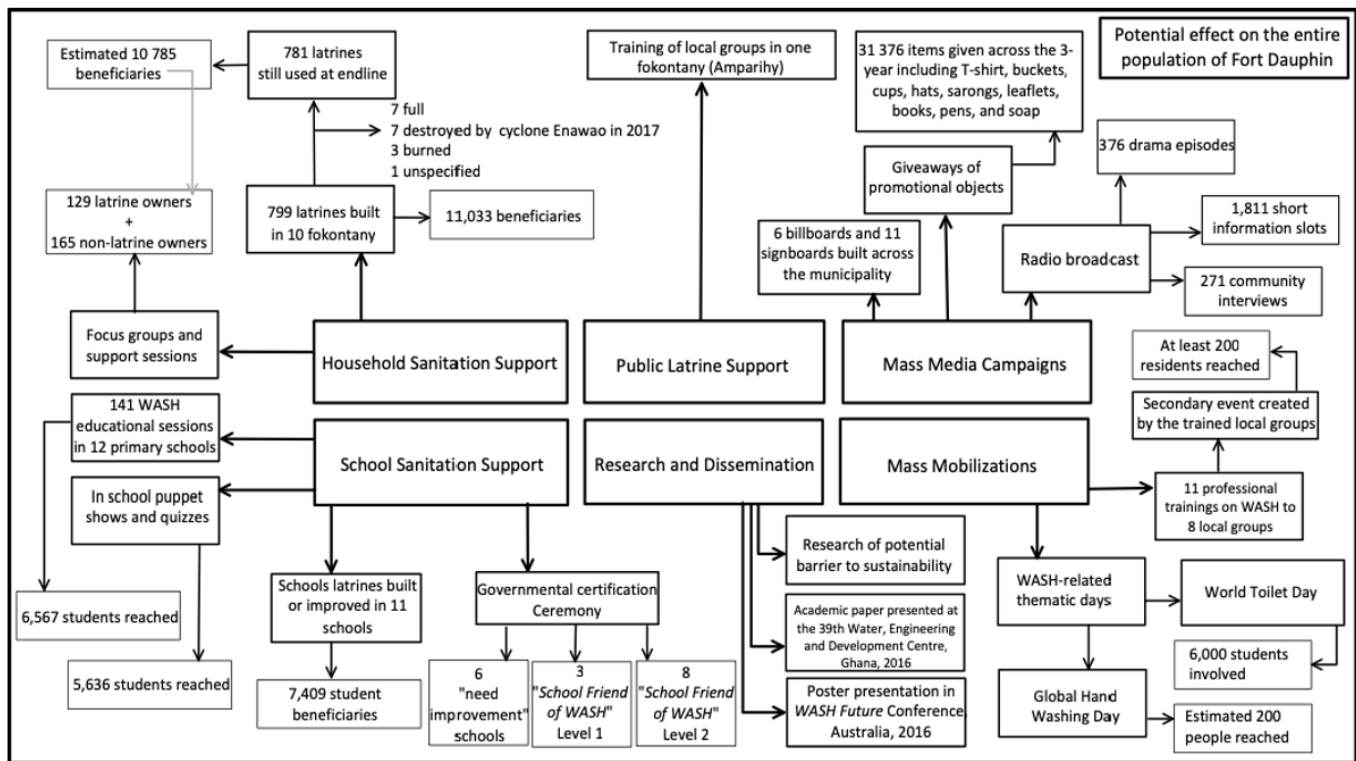
This intervention took place in the southeastern city of Fort Dauphin in Madagascar. Fort Dauphin, also known as Tolanaro, is the capital of the region, despite being mostly inaccessible from the rest of the country (17). It is an urban municipality in the district of Tolagnaro, composed of 11 fokontany, ten of which were part of the Project Malio (18).

Antanosy people have a tumultuous history including monarchism, colonialism, and slavery. Family history is a strong determinant of the fate of individuals, and people from the Anosy region have robust beliefs regarding the importance of

respecting deceased relatives and ancestors (19). These beliefs and social norms can act as barrier to stopping open defecation. For instance, the underground is seen as sacred, and burying feces can be viewed as a profaning act. Moreover, social norms, disinformation, and the presence of various taboos and other superstitious beliefs are frequent and active contributors to the current sanitation practices (20).

Description of the Intervention

From 2014 to 2017, hybrid-CLTS techniques were used through the Project Malio, an expansion of a small-scale project in the deprived fokontany of Ambinanikely (18). Both projects were initiated by UK-based SEED Madagascar, also known as Azafady. While the intervention included providing hardware subsidies and structured training, which formal CLTS interventions prohibit, multiple campaigns addressed to the population of Fort Dauphin aimed to influence behavioral changes through use of techniques and principles from CLTS (21, 7). The primary goals were to motivate the development of action plans specific for each community to increase access to latrines for disadvantaged families, to improve sanitation for the 14 schools, and to reduce the frequency of open-defecation practices. The entire Fort Dauphin population was directly or indirectly reached by at least one arm of the intervention. (Figure 1) (22, 23).



Local groups and associations were trained through the Partnership Association Mentor (PAM) on activity design and development, on monitoring and evaluation, on planning and implementation, and on financial management (23).

Modification to the CLTS approach

The intervention implemented by SEED Madagascar avoided many extreme aspects of the CLTS approach as proposed by the Practical Guide to Triggering Community-Led Total Sanitation (25) and went beyond fundamentals principles by helping households and schools to construct and improve latrine and hygienic facilities (26). Time constrain and urban characteristics forced the omission of some triggering activities. For instance, transect walks were not be possible for large fokontany and the lack of defined borders between each community created tensions between neighbors fokontany du to the tendency to blame others for the presence of feces in a specific spot (24). The combination of triggering activities and provision of subsidies was justified by the desire to build more robust and long-lasting latrines (24). Stakeholders involved in the planning and implementation of the Malio project estimated that providing technical and financial supports would ensure the construction of more sustainable latrines based on the possibility to reach a higher standard (24).

Method of Monitoring Changes in Behaviours and Latrine Coverage

In order to monitor changes, several indicators were attributed to four outcomes of interest: development of community action plans, usage of household latrines, effectiveness of school sanitation programs, and adequacy of maintenance of communal latrines. For each Fokontany, monitoring was done continuously and ultimately by one of the ten monitoring committees comprised of Community Sanitation Agents. Every 3 months, new groups of beneficiaries were asked to assess and rate the adequacy of maintenance, utilization and hygiene of each other's latrines and washing station (23). Indicators for all outcomes were based on quantitative evaluations and measured whether there was changes in absolute numbers or in levels of adequacy. For instance, indicators to estimate coverage and latrine usage included: the calculation of the number of households maintaining latrine built as plan, the number of households considered open-defecation free, and the level of diarrheal disease amongst children aged under 5 years old in recipient families. Because reports of the project were not written by formal researchers, there are missing information regarding specific methods used to collect information and to determine the level of improvement. In general, data was collected from quantitative surveys at the household levels and observations reported by community mem-

bers and Sanitation Agents. Local medical centers were also involved in data collection regarding the implementation and impact of community action plans. However, accuracy was low, and data were retrieved from the final analysis. For school latrine, the Ministry of Education, Water, Sanitation and Hygiene and the regional WASH network were involved to evaluate schools and determine whether or not they qualified as School Friend of WASH. Finally, while this intervention was not specifically designed as a randomized control trial, comparison between beneficiary and non-beneficiary of latrine was available regarding diarrheal incidence and changes in hygiene behaviors.

Impact on Health and Behavioural Outcomes

Outcomes

As mentioned, project Malio's impact was evaluated according to four main community outcomes: the development of community action plans, access and usage of household latrines, effectiveness of school sanitation programs, and adequate maintenance of communal latrines. Presented information are retrieved from SEED Madagascar final report published in 2017. The latter contains more detailed information regarding health and behavioral indicators briefly reviewed in this Case Study (23).

Community Action Plans

According to the final Project Malio report, the development of community action plan, as a result of this intervention, was very successful. Improvements in hygienic practices such as washing hands and using latrines were also documented, likely leading to improved overall health across the community (23). However, there are several weaknesses in the way these results are presented. For the most part, outcomes are not comparable to baseline since public health data is limited across Madagascar, there are no nationwide health surveys, and there was no baseline assessment in the communities. We also do not know how the targeted fokontany compare to others across the country. The disclosed 98% of participants who self-reported washing their hands after using the latrine and before eating, at the end line, seems artificially high and this suggest potential presence of biases (e.g., interviewer bias, social-desirability bias) (23, p.19).

Household Latrines

An increased number of latrines combined with efforts to change perceptions of open defecation and the importance of maintaining the latrines might be related to the decreased incidence of diarrheal disease at the end of the intervention. Indeed, 49% of the households achieved Project Malio's "gold standard" on the rating scale for participatory monitoring. However, this is lower than the 75% project objective (23).

Specifically, to this indicator, the three components of the rating scale were latrine cleanliness, latrine maintenance and condition, and presence of a hand-washing station. In order to reach the highest rating, the latrine needed to have no dirt, trash or waste in and around it, have very surrounding flies and be free of bad smell. The latrine needed to have well-built roof, nothing broken and an adjusted and hermetic lid at the time of the investigation (23, p.7). The hand-washing station needed to be utilized and functional, close to the latrine, and equipped with soap. Despite being listed as an important outcome, the “number of households no longer practicing open defecation and now using improved sanitation facilities” was unknown by the end of the project (23, p. 7). This could indicate a lack of methodic monitoring and a lack of forethought on the part of the implementing and monitoring team.

School Sanitation

The third outcome was the effectiveness of school-based interventions in sensitizing students to adequate sanitation practices. The strategies implemented to reach this outcome are depicted in Figure 1. Again based on project Malio’s final reports, the school interventions were overall successful and there have been plans to expand the outreach program to other schools in the region. The WASH program, however, cannot ensure that good hygiene practices

were maintained outside the school environment. Older students might be less sensitized than the younger school children, and maintenance of latrines and soap availability may not be consistent since these infrastructure and products are used by many people. Due to the lack of demographic data we have on Madagascar and Fort Dauphin, we do not know the proportion of children attending school, which is a major limitation in terms of the outreach of the school intervention.

Communal Latrines

The fourth outcome is the adequate maintenance of communal latrines. In order to be considered adequate, latrines had to be operational, regularly cleaned, and in good condition. This was important to increase improved sanitation access for overcrowded households, to limit the risk of fecal contamination of water sources, and to protect the poorer and most vulnerable members of the community. Once again, the objectives set by Project Malio were largely met since maintenance and cleanliness were generally up to the standards set, which included daily wash for the entire duration of the project. However, throughout the 3-year project, public latrine technical and financial support by SEED Madagascar or peer association was done in only one fokontany (e.g., Amparihy) and belatedly introduced in another during the last months of the intervention. Agreement regarding funding

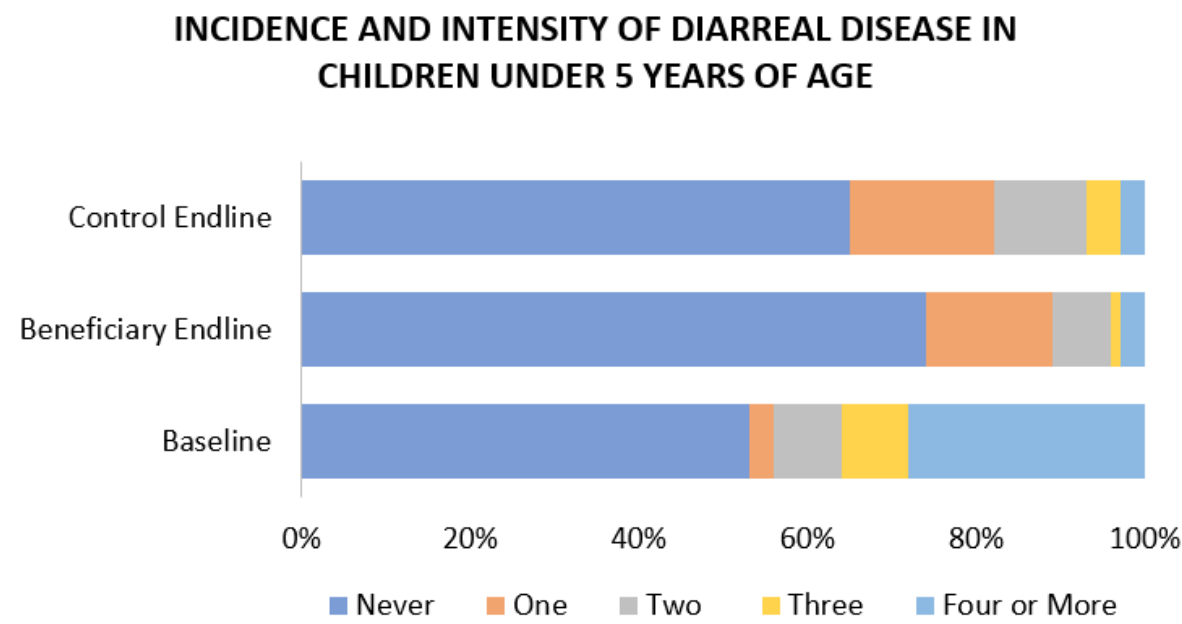


Figure 2. Yearly incidence of different frequencies of diarrheal disease in children under the age of five who were direct beneficiaries of the Malio latrine (23)

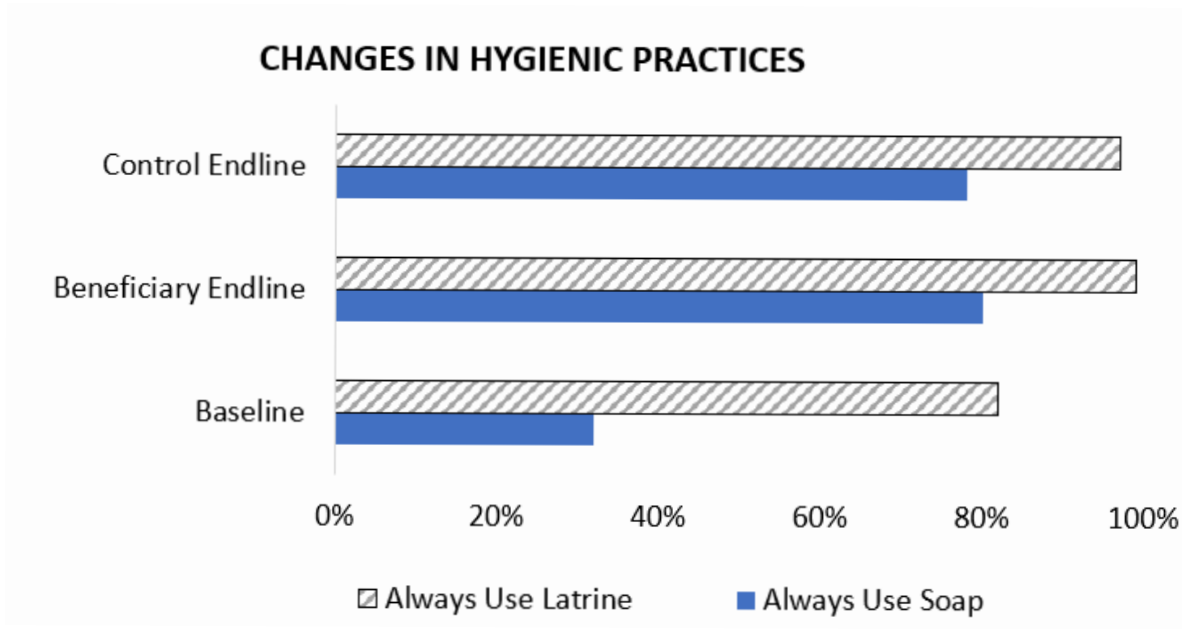


Figure 3. Percentage of the population using latrines and washing hands at baseline and endline for both latrine and non-latrine(control) beneficiaries (3)

seemed precarious and sustainability of communal latrines remains unclear.

Self-Reported Incidence of Diarrheal Disease in Fort Dauphin

Self-reported measures of health, which comprised incidence of diarrheal disease in children under five years old and hygiene behaviors (e.g., use of latrines and soap in hand-washing), were the main indicators of the intervention's success. Evaluated with questionnaires, the self-reported changes in diarrheal incidence and hygiene behaviors were favorable to the project objectives. Based on the final report, latrine beneficiaries as well as household without latrine had reduced incidence of diarrheal diseases in children under 5 years old, and improved hygiene behaviors at the end of the 3-year intervention (Figure 2; Figure 3).

Financial Implication

Project Malio was funded by the National Community Lottery Fund and Guernsey Overseas Aid & Development Commission (27). In February 2013, and December 2014, the National Lottery Fund gave £2,502 and £374,065 through the International Community grant programme for Project Malio (28). The £58,443 given by the Guernsey Overseas Aid & Development Commission was distributed over all 3 years of the project (29). These funds were ultimately used to build 799 household latrines and improve

17 school sanitation infrastructures, to educate students from 12 primary schools, to train eight local groups regarding good hygienic behaviors and knowledge transmission, to support mass mobilisation and mass media campaigns, to conduct monitoring and follow up, to disseminate the project evolution, and to evaluate the project sustainability beyond the end of the intervention (23). A negligible amount of community contributions, equating to less than 1000 out of 435k, were also received as part of the community commitment (24).

In terms of financial management, it is not possible to determine exactly how much was spent on each activity due to a lack of availability of the financial records. While the NGO uses social media regularly (e.g. Twitter), it was difficult to communicate with their personnel, and they were unable to provide any further details regarding the financial aspects of this project. Moreover, it is challenging to have an accurate estimate regarding the number of people affected by the intervention, since many activities targeted the permanent residents of Fort Dauphin indirectly.

Based on SEED Madagascar's final report, the project affected many people both directly and indirectly (Figure 1): an estimated 11,000 people benefit from the additional 799 latrines constructed over the duration of the project, and an estimated 7,000 students have now greater access to

improved sanitation at school. About 200 permanent residents who were not beneficiaries of the latrine subsidies participated to focus groups and support sessions. Ultimately, mass mobilization reached up to 6,500 residents, students and local groups through the Global Handwashing Day and World Toilet Day events and professional trainings, and mass communication campaigns that included more than 31,000 giveaway items, 17 billboards and signboards, and 2,000 radio broadcasting, targeting all people living in Fort Dauphin (23). Therefore, it is difficult to believe that less than half a million pounds were needed in the course of the 3-year intervention, and the possibility of more funding involved in the project is plausible.

Discussion

Overall, the outcomes of Project Malio highlight a number of lessons that can be applied to future CLTS projects in urban areas, in Madagascar and beyond. Key factors driving the success of this project included: adaptations to respectfully navigate cultural traditions and values surrounding open defecation, sanitation and hygiene; adaptations to better fit the CLTS approach to the urban (as opposed to rural) context; and the donors' flexibility in allowing for ongoing change and adaptation throughout the life of the project. There remain, however, several ongoing challenges within this approach and its reports, including: the scope

of stakeholder engagement; and a lack of rigor in the impact evaluation report. More transparency and sustainability in financing, and recognition of the limited scale of the intervention within the context of a broader WASH strategy are needed to adequately compare outcomes to other interventions, and to estimate effectiveness for other contexts. These strengths and challenges are discussed in more detail in the following section.

Successful Adaptations

A major factor in the prevalence of open defecation in Madagascar is the set of traditional cultural beliefs and values that normalize and even encourage the practice (20). Taboo surrounding mere discussion of these topics, for example, can make it particularly challenging to implement a CLTS approach. Adapting to the local cultural context, in response to this challenge, was a motivating factor in the development of Project Malio's 'hybrid' CLTS approach. These adaptations included employing local Malagasy staff as 'Community Liaison Officers,' to facilitate meetings and activities on behalf of the project understood how to respectfully navigate cultural taboos and social norms (26). Project staff also commenced all community meetings and activities with a formal apology to elders for the content of the ensuing discussions, as a way of respecting existing social structures, and ongoing discussions between project staff,

elders, and local community members helped ensure that the ‘shock-value’ driving the CLTS methodology was preserved, while avoiding causing such offense to community members that the intervention would become ineffective (26).

Some specific difficulties in implementing CLTS in an urban (as opposed to rural) context are the lack of defined borders between neighborhoods, as well as difficulties in getting a critical mass of people to attend in-person meetings and events (27). Overall, Project Malio organizers were successful in adapting the CLTS approach to these conditions. For example, by eliminating transect walks, which are normally part of CLTS, community members were less likely to shift the ‘blame’ for sanitation issues onto their neighbors and avoid taking responsibility themselves. By including mass media campaigns (through radio programs, or visual messaging such as billboards), Project Malio was able to transmit their message to a much wider audience. Finally, donors were supportive of the ongoing evolution of the project itself, facilitating the necessary adaptations and ongoing discussions (27).

Ongoing Challenges

Although the engagement activities themselves were well-adapted to the local urban and cultural contexts, the scope of stakeholders involved in the project remained an ongoing challenge within Project Malio’s

hybrid-CLTS approach. Specifically, the project’s failure to include stakeholders beyond residents (such as enterprises, health-care providers, and financial institutions) neglects the reality that in urban contexts, residents often need to work in collaboration with governments and other actors to achieve meaningful changes (30). A barrier to widening the scope of stakeholders involved, however, is the potential to introduce more complexity in terms of management, illustrated by the difficulties Project Malio organizers already faced in coordinating between the behavioral change and construction teams (27).

In terms of financing, the high costs of constructing latrines in urban areas, due to a lack of availability of land and local building materials relative to rural areas, presented challenges in terms of providing material subsidies for the poorest and most vulnerable schools and households (27). While providing these subsidies – a departure from more traditional CLTS approaches – contributed to the overall success of the project, the amount that households were required to contribute towards latrine construction (approximately 1.75 CAD) was reported as being prohibitively high for many of the poorest households (31). The high costs associated with latrine maintenance, including emptying once latrines reach capacity, and a lack of service provider options for latrine pit emptying and fecal sludge management is another

ongoing challenge to this intervention, and could present a major barrier to the long-term sustainability of the intervention (32).

Overall, a lack of transparency in terms of financing, including a lack of information regarding the cost of the intervention and where funds were allocated throughout the project's duration makes it difficult to evaluate the cost-effectiveness of the intervention, and makes it challenging to determine whether it might be effective at other scales or in other regions.

Finally, it is vital to recognize that CLTS is only one tool within a larger category of behavioral change and communication-based interventions, which themselves are only one set of tools within a broader sanitation strategy. Therefore, while this hybrid-CLTS intervention does address key cultural and behavioral factors that contribute to open defecation in Madagascar, it does not address broader structural factors such as a lack of clean water, intermittent water supply, or overall low socioeconomic status, which affect most households and institutions in the country.

Strengths and Limitations

Overall, SEED Madagascar's reports gave an optimistic interpretation of their intervention's results. While the intervention met most of its objectives, some of the indicators used were difficult to quantify

due to limited access to the dataset. Only superficial and potentially incomplete data was available from the Project Malio reports and lack of national statistics limits the validity of the historical comparison.

Some of the figures presented in the final report contained contradictions to other sources of data and could be indicative of flaws in the data collection process. For instance, 84% of people interviewed reported using a latrine at home, while interviewers only observed latrines in 69% of households. Inconsistency in the results might indicate the need for better training of the personnel regarding data collection and bias management.

It is worth noting that the project success could be exaggerated due to the potential influences of biases from both the interviewees and the interviewers involved in follow-up monitoring. There is a lack of information required to determine whether the method used in Fort Dauphin could be replicable elsewhere and results should be interpreted with caution.

Future Directions

Despite construction of latrine being insufficient on its own to solve sanitation issues, it is estimated that an additional 1,500,000 latrines are needed in order to eliminate open defecation in Madagascar, a number over 1800 times more than

the amount constructed through Project Malio (5, 33, 24). Moreover, community-based approaches to promote behavioral changes and foster usage of latrines are deeply needed to ensure efficacy of WASH interventions in low income settings (5). The hybrid-CLTS approach can be seen as successful in addressing key behavioral and cultural drivers of open defecations, with a limited capacity to respond to structural-level drivers of open defecation, such as limited sanitation infrastructure, poor water management, and insufficient allocation of funding to sanitation nationally. Therefore, the Malio project by SEED Madagascar must be framed as only one tool within what must be a broader strategy for improving sanitation in Madagascar. Overall, the evidence presented in this report suggests that SEED Madagascar's hybrid-CLTS approach may be better suited to act on the cultural and behavioral drivers of open defecation than to improve infrastructure through latrine construction, particularly in urban areas where costs are high. Partnerships between organizations or institutions that focus on implementing cost-effective behavioral-level and structural-level interventions, respectively, in addition to participatory planning approaches, may prove to be important future directions in terms of scaling up efforts to eliminate open defecation in Madagascar completely. Increasing access to documents related to costs and outcomes of future projects can

also help in choosing where to focus future efforts and identifying which interventions or organizations should be involved.

To ensure that Malagasy continue to use the tools provided in the intervention once the project organizers leave, measures promoting long-term, sustainable latrine use and maintenance need to be developed.

This could include promoting sanitation entrepreneurship via microfinance in order to increase local, affordable service provision options for latrine pit emptying and fecal sludge management, as well as general maintenance (27). However, research on fecal sludge management services in developing urban areas is limited (34), and this is a barrier that will need to be overcome in the long-term.

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