EFFECT OF MONITORING FREQUENCY REGIMES ON PROGRAM OUTCOMES: A CASE STUDY OF THE 'DISPENSERS FOR SAFE WATER' PROGRAM IN KAKAMEGA COUNTY, KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted to any other institution of learning for examination or an academic reward.

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DEDICATION

This research project is dedicated to my husband Wycliffe Okoth and children Myrah and Tasha.

ABSTRACT

Monitoring and evaluation are important management functions in ensuring that program/project objectives remain on course and the expected outcomes are realized. However, there is limited information on how different monitoring and evaluation (M&E) design components affect program outcome(s). Specifically, the extant literature is not clear on how frequency of monitoring regimes affects ultimate program outcomes. The study's main objective was to assess the effect of monitoring frequency regimes on program outcomes in the Dispensers for Safe Water program in Kakamega County. The study focussed on three program outcomes namely; adoption of chlorine dispensers by target communities, dispensers' empty rates and promoters' capacity to undertake promotional activities. The specific objectives were: to evaluate the effect of monitoring frequency on community's adoption of chlorine dispensers; to assess the effect of monitoring frequency on the level of dispenser's empty rates; and to examine the effect of monitoring frequency on community promoter's capacity to undertake promotional activities. The dynamic capability theory was used to conceptualize the connection between effects of changing M&E system on program outcome(s).The study adopted a comparative cross-sectional research design and used both quantitative and qualitative data. The study relied on secondary data from 15,336 households collected by Dispenser for Safe Water (DSW) program between January 2013 and December 2019, while qualitative data was collected from 17 key informants consisting of 12 community promoters and 5 DSW management team members. Quantitative data was analysed through descriptive and inferential statistics which included frequency, mean, standard deviation and percentages. In addition, regression analysis was done to test for significance of effect of frequency of monitoring on each of the three program outcomes. Analysis of variance (ANOVA) was used to compare means and proportions in different monitoring regimes. Thematic analysis was used to analyse qualitative data from management team and community promoters. In terms of chlorine dispenser adoption, shifting from one-month regime to two-month regime had no significant effect on the level of adoption. However, changing frequency of monitoring from one-month to three-month monitoring regime could reduce the proportion of households using the dispenser by between 4.6% and 20.2%. Therefore, changing frequency of monitoring by more than one month had significant negative effect on chlorine adoption. On average, increasing the frequency of monitoring by one month increased the rate of dispenser empty rates by 6.9% while increasing by two months increased the proportion of empty dispensers by 14.6%. The promoters' capacity to undertake promotional activities did not significantly change when the program increased their frequency of monitoring by one month but improved by 12.4% if it was increased by two months. Program management attributed increased chlorine adoption and decreased dispenser empty rates during one-month or two-month monitoring regimes to timely and informed decisions derived from frequent monitoring reports. Reduced community-promoter engagement during one- or two-month regimes was attributed to the inability of promoters to offer more time for engagement beyond the monitoring process. DSW was justified to implement the two-month regime on the basis of cost of monitoring since there is no significance difference between one-month and two-month regimes. The findings of this study should help program implementers, monitoring and evaluation personnel, and policymakers to understand how frequency of monitoring affects each program's key indicators when developing monitoring and evaluation designs.

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LIST OF ABBREVIATIONS/ACRONYMS

CDS	Chlorine Dispenser System
DSW	Dispensers for Safe Water
IPA	Innovations for Poverty Action
JPAL	Abdul Latif Jamaal Poverty Action Lab
KII	Key Informant Interview
RCT	Randomised Control Trial
TA	Technical Assistance
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
CDC	Center for Disease Control and prevention

OPERATIONAL DEFINITION OF TERMS

Chlorine dispenser system	An intervention strategy to maximize household chlorination through installation of a device called a chlorine dispenser at communal water sources. The chlorine dispenser enables community members to treat their water at the point of collection. The chlorine dispenser system (CDS) comprises of the dispenser hardware, chlorine refill and promoters.
Promoter-community engagement	The proportion of promoters undertaking promotional activities to motivate community members to use chlorine to improve water safety.
Dispensers for Safe Water program	A program that provides a simple solution to the problem of unsafe water in rural communities through installation of chlorine dispensers at communal water points.
Dispensers' empty rate	The frequency at which households find the chlorine dispenser without chlorine to treat their water when they go to the water point to collect water.
Monitoring regimes	The intervals/periods at which the program is monitored to measure the progress of the program in achieving its outputs and outcomes. In the context of this study, monitoring regimes are categorised as those occurring after one month, two months and three months.
Program outcomes	The intended results from the initiatives formulated and implemented to improve the communities' quality of life by

providing access to safe water.

Rate of adoption Proportion of households served by program using chlorine to treat their water. This is the number of households using chlorine divided by the total number of households sampled from the targeted population.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Project management is the application of knowledge, tools, skills and techniques to project or program activities to ensure that objectives are achieved. Project management is interactive in nature, partly due to the progressive need to review a project or program over its life cycle. It entails planning, organizing and controlling organization resources and processes for relatively short-term objectives that make up long-term outcome or impact. In this case, a program is a set of unique processes consisting of a set of coordinated and controlled activities within a given period that are undertaken to achieve specific objectives under constraints of time, cost and resources (Nyonje, Kyalo & Mulwa, 2015).

Both monitoring and evaluation are management tools. In the case of monitoring, information is collected routinely to track the progress according to previous program's schedules and plans and review program outcomes to ensure the program is implemented as per the plan. Crawford and Byre (2003) define monitoring as an ongoing process of data collection and analysis to primarily track the impact and improve efficiency of a project. However, evaluation is both systematic and independent. Evaluation is an assessment process of an ongoing or completed project including program's implementation and results (Uitto, 2004). Monitoring and evaluation are different yet complimentary processes (Gorgens and Kusek, 2009). Hunters (2009) defines evaluation as the systematic collection and analysing of information of an ongoing or completed program geared to ensure that a program meets the goal and objectives that were fundamental to its undertaking. Project evaluation informs the program decisions by providing required information.

Monitoring and evaluation (M&E) systems support in understanding a range of tasks that various people ought to undertake during the lifecycle of a program. The main purpose of monitoring and evaluation systems is to provide details about the program that is required for impact-oriented program management and to engage key stakeholders on how to improve implementation of the program. Monitoring and evaluations systems will, therefore, provide regular reports on the progress of the program to various stakeholders. Equally, a badly developed M&E system could negatively affect the efficiency and achievement of program objectives (Jerry Adams & Ann Garbutt, 2008).

An effective M&E system is able to determine inherent benefits, risks or limitations of a program (Crawford & Brye 2003). Therefore, monitoring and evaluation provide consolidated information showcasing the program progress and enable program management to make informed decisions. It often facilitates reports to contribute to transparency and accountability, which allows project teams to learn from mistakes and provide a path to learning and improvement. Program monitoring forms the basis of questioning and testing of assumptions as well as allowing the implementing agency to incorporate the lessons in their policy and practices. M&E system offers ways to link program implementers, beneficiaries and decision-makers, which increases retention and development of institutional memory and also provides the robust basis of fund-raising and influencing policy-making (Crawford & Brye 2003).

Monitoring and evaluation practices can guide a program towards achieving its expected outcome. Therefore, many organizations have embraced the practices of routine monitoring and evaluation of key indicators. Kolb (1984) articulates the same argument, that one of the tasks that a program should be able to execute is the monitoring and evaluation of progress towards the achievement of the intended objectives. Monitoring and evaluation information can be useful in

strengthening program performance thus improving the impact of the projects results to target population. According to Kusek and Rist (2004), routine monitoring provides descriptive information on the status of the program relative to the expected outcomes. An effective monitoring and evaluation increase the capacity of the program team to make timely decisions which in turn translate into better outcomes (Crawford, 2004).

In the light of its contribution to success of a program, monitoring and evaluation should be embedded during program formulation. According Valadez and Bamberger (2000) monitoring and evaluation should be considered as a complementary component of an integrated practice. As a result, monitoring provides reports and data that inform program decisions. Therefore, monitoring and evaluation should take place either routinely from the time the program is formulated through implementation and the operational phase.

For a monitoring and evaluation system to be effective planning and good practice should go into it. This proposition is noted by Taylor, and Balloch, (2005) who avers that a comprehensive M&E plan encourages program stakeholders what to undertake according to M&E activities prior to commencement of program implementation. As such, details of how monitoring and evaluation will be instituted within a program should be articulated at the earliest possible time. Hence, it is important to provide detail and have them captured in an M&E plan. Taylor and Balloch, (2005) posit that a monitoring and evaluation plan will not only improve understanding amongst different stakeholders of the tasks ahead, but it also makes stakeholders proactive as they are aware of time and resources required for given monitoring and evaluation activity.

For M&E practice to enhance tracking project performance, routine monitoring information should be fed into it so as to help in tracking of program progress. This assertion supports that from UNDP (2000) that suggest that monitoring reports and information should be included into the project monitoring and evaluation process to build up a data bank that can be used to improve the selection and design of future programs besides improving the program. Applying this observation, this study sought to investigate how frequency of routine monitoring affects key indicators of programs. Kusek and Rist (2004) stated that monitoring and evaluation is a powerful tool that can be applied by policy-makers and decision-makers track progress and at the same time show the impact of a given program or policy. Therefore, M&E can also be geared towards enhancing accomplishment of program outcomes. In this case routine monitoring is conducted in view of attributing change in results to different program factors which can be changed in order to improve performance and effectiveness. This is achieved through frequent feedback of performance information and consolidation of lessons learned into decision making and management during monitoring process.

Monitoring and evaluation has been progressively evolving and faces diverse understanding from different people. One of the monitoring and evaluation aspects that has changed over time is the departure from the focus on indicators to a more wholesome approach. For instance, Solomon (2007) notes that implementers emphasize on indicators without factoring in the designing of M&E system that measures program outcomes associated with a given action. This is vital at administrative level as a source of baseline information. Nevertheless, according to William (2007), the disregard of monitoring frequency does not allow routine data collection at operational level which is important when making key decisions.

Globally, according UNDP (2009) M & E systems enable organizations to gauge the impact of projects/programs and also get recommendations for future interventions. However, the main shortcoming of M&E system, from the global perspective, is that there is no set standard of measuring its quality (Chaplowe, 2008). Lack of standardized way to assess the quality of M&E system makes its assessment subjective. Although, monitoring and evaluation is used to assess whether a program is meeting its objectives, for many donor-sponsored programs or projects it is a mandatory requirement to have an M&E system to determine effective use of funds by recipient organizations. WHO (2011) highlights on the significance of effective frequency of monitoring when designing a monitoring and evaluation system for water treatment programs.

Uitto (2004) assert the importance of M&E system in providing information need to make evidence-based decision for program management and improvement, advocacy and policy formulation. Wong (2012) posited that M&E system ensure that result to the level of impact, output, and outcome is measured to provide the foundation for accountability and informed-decisions and both program and policy level. According to Wong (2012), the Ministry of Finance of China, which is leading the world economic growth, expresses the importance of strengthening the mechanism of M&E systems in ensuring that the funds are well spent. M&E systems has also been used by USA government to measure performance of different government agencies (Pfeiffer, 2011).

In Chile, the government introduced M&E system for public organizations, which led to development of methodologies and standard measure of organizations that work with the public domain. Through these standard measures and methodologies, public agencies adopted better budget analysis and tracking of utilization of public funds. However, according Alotaibi (2011) in Saidi Arabia there is no performance evaluation framework or criteria of identification of

evaluation framework. Granted, lack of effective monitoring and evaluation framework has negative effects on effectiveness of monitoring design which impede success of a program.

In Ghana, above numerous government effort to develop a standardized monitoring system, there has been many challenges ranging from lack of coordination among those in charge of projects, lack of operation and technical capacity and gross financial mismanagement. In an effort to overcome the challenges, there is need to develop a better institutional capacity to strengthen capacity of developing effective monitoring system (CLEAR, 2007). In Kenya, the Ministry of Public Service, Youth and Gender Affairs indicated that frequent monitoring of youth projects has been integrated and attributed to the success of the programs (Njama, 2015). The information derived from these frequent monitoring is used to make informed decisions hence improving the performance of the project overtime. With regard to measuring an effective monitoring system in Kenya, there is lack of standardized framework on developing an effective monitoring system (Brond, 2013). Brond further highlights that to address the problem programs or projects should increase allocation of M&E systems and also enhance capacity of the system to guarantee improved communication within the firm.

A major step in the evolution of monitoring and evaluations systems in Kenya came in with the introduction of country's development blueprint, Vision 2030 in 2008. Since Vision 2030 became the principle driver of development in Kenya, the government developed National Integrated Monitoring and Evaluation System (NIMES) (Tana et al, 2011) in 2014. It was developed to track the implementation of projects, programmes and policies envisaged in Vision 2030. The information that was collected form frequent monitoring was used in formulation of policies and monitoring systems for future programs and projects (Njama, 2015). However, the NIMES was faced by many challenges such as inadequate resource, lack of time data and

inadequate capacity in many institutions. Hence, centrally executed M&E system in Kenya is a need phenomenal despite different programs and projects incorporating M&E since 1980s. In 2018, Kakamega county government appointed a County Chief Officer in charge of economic planning and service delivery. This was aimed at strengthening the capacity of monitoring and evaluation of county projects among them water projects (Kalava, 2016).

1.1.1 The Dispensers for Safe Water (DSW) Program

Two privately funded global research centres: Abdul Latif Jameel Poverty Action Lab (JPAL), and Innovations for Poverty Action (IPA), conducted a series of randomised control trials (RCTs), between 2009 and 2012, in an effort to find a solution to household use of chlorinated water. The findings presented strong evidence that the installation of chlorine dispensers next to water sources would be an effective method to ensure the chlorination of unsafe water (Kremer et al, (2014). Dispensers for Safe Water (DSW) program was consequently launched as a result of the promise that characterised the results. These research centres also assessed various strategies through which uptake could be increased, by adjusting the way chlorine is delivered. IPA, however, evaluated the uptake of chlorine following the positioning of a plastic dispenser filled with chlorine by a local water hole or stream, as opposed to relying on household-size packages. The major advantage associated with this method is that it not only reduces the distribution costs, but also creates social pressures to increase adoption among community members. The primary finding by IPA was that introducing chlorine-dispensing containers at a communal water source leads to more than 60 percent of the households using chlorine as a water purifier.

Evaluating the need for chlorine dispensers, Kane (2018) identified four problems that can be solved using the chlorine dispenser technology. The first is that 11% of the global population (or

more than 780 million people) lack access to safe drinking water. Resultantly, people are drinking and using water that is contaminated with bacteria, leading to conditions such as diarrhoea. Here, chlorination comes in as a solution due to its residual effect (Kane, 2018). The second problem is that people avoid using chlorine when they have to pay for it even in instances when the health benefits for doing so are well-known. The solution is that chlorine from dispensers is free. Additionally, a single dispenser under DSW serves at least ten households in the community as opposed to the distribution of individual chlorine bottles like some trials and charities do. This makes DSW more cost-effective. The third problem is that the dispensers, particularly in terms of both public nature and location to water sources, tend to serve as a physical reminder to the people using them. Moreover, DSW program encourages usage through the ambassadorial function through community education and local promoters who are "community volunteers". Finally, as the maintenance of conventional WASH systems is considered costly, such interventions are often neglected. However, dispensers are relatively affordable and easy to maintain (Kane 2018).

Dispensers for Safe Water Program is currently implemented in Western Kenya, Eastern Uganda and Zomba District in Malawi. The dispensers are installed next to communal water points where community members are encouraged to apply 3mL of 1.2% sodium hypochlorite, equivalent of a single valve turn, for every 20 Litres of water. Prior to installation of the dispensers, the program implementation team conducts exploratory surveys to ascertain the viability of the dispensers in the targeted region. Afterwards, the program implementation team conducts stakeholder sensitization meetings with key stakeholders from the ministries of water and public health. During these meetings, the stakeholders nominate water points suitable for dispenser installation. The program implementation team visits these water points to verify if

they meet the minimum criteria for dispenser installation. Part of the key criteria for consideration include; the water source should be used for drinking, used by 10+ households, has constant supply of water for more than 8 months per year, the land owner consents to host the dispenser (for those in private land) and the water should not be turbid.

After water point verification, the program team conducts community sensitization meetings at village level before the dispensers are installed. The last sensitization meeting is conducted at water point level where the users select two community members, dubbed as promoters. The promoters' responsibilities include; continually sensitizing community members on the importance of treating their water using chlorine from the dispenser, refilling the dispenser with chlorine and acting as a liaison between the community and the program team on matters chlorine dispensers. Any community member that meets the minimum requirements highlighted by the program team can qualify to be a promoter. The requirements include someone that; stays next to the dispenser water point, relates well with community members and has access to a phone. The program implementation team distributes chlorine to all dispenser water points and addresses all dispenser maintenance issues.

The program has an independent monitoring and evaluation team that collects monitoring data on regular basis including testing water samples at household level for presence of chlorine residual.DSW monitoring and evaluation systems is designed to monitor chlorine up-take among the target population, promoter capacity to encourage community members to use the dispensers as well as the status of the dispensers in terms of functionality and emptiness.

1.1.2 DSW Program's Monitoring Systems in Kenya

In Kenya, DSW is scaling dispensers and aims at providing 2 million people with access to dispensers over a period of three years. A variety of operational models for service delivery have been tested in Kenya, with additional research carried out between 2009 and 2011 on the best ways to engage local promoters to boost usage of chlorine to treat drinking water. During this

lled 2,500 dispensers that served approximately 500,000 people. As one of the regions in which the DSW program has made knowledgeable progress, dispensers are an innovation in the Kenyan rural water sector as they are a solution to various challenges that hinder sustainable, quality water delivery services.

Figure 1.1: Dispenser for Safe Water (DSW) Chlorine dispenser

Over the lifetime of the program, DSW has adjusted its M&E systems. Initially, the program was monitoring after every three months followed by every month and later adopted monitoring after two-months. Sampling of water points and households for monitoring is done using two-stage cluster sampling. At every program cluster, 1.5 % of water points are randomly selected and eight households who collect water from the sampled water points are randomly selected and monitored. It should be noted that these transitions in monitoring regimes were majorly guided by the cost of monitoring rather than the effects each monitoring regime had on the outcomes of the program (Evidence Action,2014).

Upon the realization that recontamination of water during storage in the household is a big challenge towards communities reaping the maximum benefits of water quality from source protection, researchers (Hartung et al. 2010; and Worsham, 2017) conducted a range of experiments that were geared towards increasing the level of chlorine usage. This intervention comprised a dispenser installed at shared water sources. Hartung et al. (2010) has suggested the use of locally elected dispenser user/promoter to be refilling the dispensers and encouraging community members to use the dispensers. On the other hand, Langat et al. (2013) studied the efficacy of DSW program's monitoring and evaluation systems and recommended that the program builds a system of mobile applications and databases to better enable the field team to access, edit, and operationalize the information collected. This highlights the significance of monitoring and evaluation features on program outcomes. Similarly, Nazmul (2013) has evaluated the impact of sampling in impact evaluation, exploring such aspects as the appropriate number of items to be included in an evaluation sample and the important trade-offs between cost and reliability of findings. Nazmul concluded that small samples create risks for policy decisions. Incorporating the insights by Nazmul, this study seeks to explore the effect of

monitoring frequency on program outcomes, using the DSW program in Kakamega County of western Kenya as a case study.

Findings by Erin Worsham, Robyn Fehrman, (2017) indicated that promoter engagement, chlorine dispenser functionality and empty rates are the main drivers of chlorine uptake among the target population. Therefore, this study used level of chlorine uptake, dispenser empty rates and promoter-community engagement to assess the effect of frequency of monitoring on DSW programs outcomes.

For routine monitoring and evaluation process, Dispenser for Safe Water (DSW) monitors several key indicators such as chlorine uptake, supply of chlorine and promoter-community engagement to inform the program progress. Chlorine uptake (chlorine adoption) indicates the percentage of community households in the targeted population that are using chlorine to make their water safe for drinking. Presence of traces of total chlorine residuals in drinking water are tested using N, N-diethyl phenylenediamine (DPD) colorimetric method. Community households are also asked about the availability of chlorine at the water point, which is used to gauge the efficiency of chlorine supply in the community. DSW program volunteers, who are community promoters, are tasked to undertake promotional activities. To evaluate promoters' engagement, community members at the household level are asked whether the promoter has talked to them about the dispenser over a given time period.

1.2 Statement of the Problem

With the numerous strategies that are used for evaluation and monitoring systems, there is need to establish the exact type, magnitude and extent of the evaluation and monitoring systems so as to be able to quantify any setbacks and/or successes of such programs. Broadly,

operationalization of many aspects of monitoring and evaluation are guided by other features such as cost and sufficiency of human resource and the effects they have on the program outcomes. More specifically, the DSW program tried monitoring key indicators after every month, then after every three months and thereafter adopted monitoring after every two months. It should be noted that these transitions in monitoring regimes were majorly guided by the cost of monitoring rather than the effects each monitoring regime had on the outcomes of the program (Evidence Action,2014). Naturally, this gives rise to the concern as to whether the length of the monitoring regime has any discernible effect on the program's outcomes.

Numerous literature on M & E highlight the significance of aspects such as sampling, budget, theory of change (ToC) and timeliness of monitoring on program or project outcomes. However, these past studies hardly explore aspects such as the effect of monitoring frequency, as a component of evaluation design, on the realization of expected program outcomes. Additionally, despite timeliness of monitoring and evaluation being recognised as a vital component of M&E design, not many studies have explored how it actually plays out 'on the ground'. There is therefore a need to study the effect of monitoring frequency regimes on program outcomes. This study sought to explore this phenomenon using the DSW program in Kakamega County as an empirical case.

1.3 Main Objective

The main objective of the study was to assess the effect of monitoring frequency regimes on the achievement of program outcomes in the Dispenser for Safe Water program in Kakamega County.

1.3.1 Specific Objectives

i. To evaluate the effect of monitoring frequency on community's adoption of chlorine dispensers;

ii. To assess the effect of monitoring frequency on the level of dispenser's empty rates; and

iii. To examine the effect of monitoring frequency on community promoters' capacity to undertake promotional activities.

1.4 Research Questions

i. What is the effect of monitoring frequency on community's adoption of chlorine dispenser in the targeted population in Kakamega County, Kenya?

ii. What is the effect of frequency of monitoring on the level of chlorine dispenser's empty rates in Kakamega County, Kenya?

iii. What is the effect of frequency of monitoring on DSW community promoters' capacity to undertake promotional activities, in Kakamega County, Kenya?

1.5 Significance of the Study

Various studies (Evidence Action, 2014; Langat et al., 2013; Marshall, 2011; Musoka, 2018; and Owino 2018) have previously been carried out to find solutions to the persistent challenges to access to clean and safe water by communities around the globe. However, while such studies have facilitated the formulation and implementation of programs to realize their objectives, they do not specifically deal with the influence of monitoring and evaluation design features such as sampling, frequency of monitoring, and program cost on program outcomes. The arising question is whether a variation in the frequency of monitoring—measurement and data collection rounds—would have an effect on the program's outcomes. This study sought to focus on

exploring how program outcomes such as chlorine uptake, dispenser empty rates and promoter's capacity to undertake promotional activities are affected by the frequency of monitoring, which should be thought through when designing M&E systems. By so doing, the study will be significant to four groups of entities: the academic fraternity; policymakers and sponsors; and most importantly, programs' implementers, administrators and monitoring and evaluation personnel. The study will serve as a point of reference for the academia, while at the same time be a basis for decision making for both policymakers and donors. Similarly, the results of the study will help program implementers, administrators, and monitoring and evaluation personnel make appropriate improvements to achieve expected outcomes in future programs.

1.6 Scope of the Study

The study focussed on the effect of monitoring frequency on the Dispenser for Safe Water program's outcomes in Kakamega County, Kenya. Dispenser for Safe water program monitors numerous household water treatment and storage practices. However, according to Evidence Action (2014) chlorine dispenser empty rates and promoter's capacity to undertake promotional activities were established to be the main drivers of chlorine dispenser adoption among the targeted population. This informed the researcher's decision to use chlorine dispenser empty rates, promoter's capacity to undertake promotional activities and level of chlorine adoption as the main outcome indicators of the study.

1.7 Limitation of the Study

The study experienced several limitations. However, measures were put in place to mitigate these limitations. Key informant interviews were carried out during Covid-19 pandemic. Therefore, interviews were undertaken under strict adherence to Covid-19 mitigation strategies issued by the Ministry of Health. DSW program promoters were distributed across all the sub-counties in Kakamega County hence accessing some of them was a challenge due to harsh

weather conditions and poor terrain. To mitigate this, the study period to undertake key informant interviews was increased by two weeks. Vastness of the study area and promoter revisits posed financial challenges for the researcher. This was mitigated by combining interviews based on proximity.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature that relates to the existing theories and models, implementation, and operationalization of different monitoring and evaluation aspects and how they affect program and project outcomes.

2.2 Effect of M & E design on program outcomes

An M&E system comprises a set of intertwined activities that must be undertaken in a coordinated way for the objectives to be met (Pius, 2017; and Samdi, 2007). The design of an M&E system ought to not only commence at the same time as the overall program but also be subject to the same appraisal criteria, particularly with regard to economic and financial matters, so as to achieve and secure the desired objectives in the least-cost means (Pius, 2017). According to Samdi (2007) and Nutley (2012), many M&E designs are not effective as they are normally set up after the program has already commenced.

2.3 The effect of specific M&E aspects on program outcomes

The first M&E aspect that affects program outputs is budget and budgeting by influencing the total costs of the program, and thus its performance. According to Ntiniya (2016), the silo approach adopted by various government-sponsored programs has led to the performance of functions such as planning, budgeting, and M&E itself, to be performed by varied institutional sections in isolation of each other. This is emphasised by study undertaken by Mwangu & Iravo (2015) where the success of projects that do not have internal monitoring and evaluation mechanism are likely not to achieve the expected outcome. Most of Constituency Development Fund (CDF) project were monitored by observed that Constituency Development Fund

Committees. The M&E system aspects formulated nay not align with some of the projects. The major drawback resulting from this scenario is the misalignment and desynchronization of the implementation plan with the cost of the program. Mwangu & Iravo (2015) noted the frequency of monitoring had an effect on success of the projects, however, this varied with type of projects/programs.

The overall budget, according to Ntiniya (2016), should provide a sufficient and clear provision for the various M&E activities. During program implementation, M&E costs ought to be delineated within the overall program budget. Kelly and Magongo (2004) argue that monitoring and evaluation alone should account for 5-10% of the entire program budget. Although it should follow that the larger the program being undertaken, the larger the budget, there is no evidence that the size of the program and thus the budget influences the efficiency of monitoring and evaluation (Krause, 2010). Frequency of monitoring is noted Lawal and Onohaebi (2010), who as essential and of great importance to a program because of the information it provides thereof leading to informed decisions. However, Subramanian et al (2009) propose that project or program performance, in term of key indicators, should be considered when determining the time interval or regularity of monitoring project activities.

The second M&E aspect that affects program outputs is the sampling and availability of sampling frame. Liberts (2013) argues that the size of the sample involved in a program can influence the efficiency of the outcomes of the monitoring and evaluation process. To effectively contribute to design and planning, adequate samples must be included in the program before it starts. Of importance with regard to the sample is the sampling process and frame. The purpose of sampling is to obtain high quality estimates of population parameters with the lowest cost. In

monitoring and evaluation, just like in all studies, the target population implies the entire group of units from which the researcher could theoretically collect data.

Third, the timeliness, carrying out monitoring and evaluation at appropriate time in the project implementation cycle, also have a significant effect on program's output. In this regard, it has been argued that since monitoring and evaluation are a vital management tool in tracking program progress and facilitating decision-making, they should be undertaken as per the program implementation strategy (World Bank, 2019). This enables the implementers to make any changes as and when necessary. Additionally, this reduces the wastage of resources as corrective measures are adopted and implemented as soon as a flaw in the program design is identified. Project/program time implies the total time a program takes to realise the set objectives in terms of the number of days/weeks, from start to practical completion. Within the concept of timeliness of monitoring and evaluation, Ntiniya (2016) argues that programs undertaken within set time frames are more successful than those that are not.

2.4 Effect of frequency of monitoring on program outcomes

2.4.1 Effect of monitoring frequency on chlorine uptake

Focusing on the context of the evaluation, and using J-PAL as a point of reference, Kremer, Miguel and Mullainathan (2014) lament the extremely low adoption of clean water and sanitation practices in rural Western Kenya, despite extensive awareness of the dangers that accompany the drinking of unsafe water. Using the results of J-PAL, Kremer, Miguel and Mullainathan highlight the disproportionate outcomes with regard to the existing awareness and adoption of safe and clean water practices. For instance, while 75% of households are familiar with point-of-use water chlorination and another 70% claim that they are aware that drinking dirty water is a major cause of diarrhoea, research indicates that it is only 5% of households in

this region that report that their primary source/supply of drinking water is chlorinated (Evidence Action, 2014). Due to the advantage of using community-managed water and sanitation program, communal chlorination is regarded as the best strategy for increasing chlorine uptake. In this design, social pressure is high as the sanitation choice of each individual in the community is publicly known, pushing up adoption rates.

According to Kremer, Miguel and Mullainathan (2014), J-PAL hired local community members at a low wage to help persuade, promote and encourage the use of chlorine among members of the community. This strategy was considered highly effective at increasing chlorine use. The study detected chlorine in 40% of households that were visited by a promoter in comparison to only 4 % that were not visited. Similar results were obtained by Yates et al. (2016), but from a larger scope covering the Democratic Republic of Congo, Haiti, Senegal and Sierra Leone. These assertions suggest continuous monitoring influence the uptake of a new water treatment technology. Nevertheless, would frequency of monitoring affect how the target population adopts the chlorine dispenser technology in Kakamega County too? This remains an open question.

The frequency of monitoring may improve the level of uptake of new water treatment technology among the target population. The information derived from routine reports is used to make decisions which may guide the program to implement measures that may improve the level of technology adoption. This is stressed by Schwemlein, et al (2016) who proposed that frequent monitoring leads to improved results since the information collected informs decisions. Bartram et al, 2014; Fisher et al 2015 & Jordanova et al (2015) indicate that routine monitoring improves the level of the project or program use of programmatic data to yield valuable and insightful

decisions and strategically realigns the program with target population expectations and beliefs hence addressing misconceptions.

2.4.2 Effect of monitoring frequency on promoters' capacity to undertake promotional activities

The quality and sustainability of a program can be improved by engaging the community in the process involved to monitor, develop and implement it. For this study, however, the frequency of monitoring focuses on households' use of chlorine to treat their water, promoter's capacity to encourage households to use chlorine and refill the chlorine dispensers. Positive outcomes significantly depend on influencing the community's attitude toward the program, as well as the interaction with the program's promoters and administrators (community engagement), which can be understood through social network analysis (SNA) (Goldberg-Freeman et al., 2007; 2010). Goldberg-Freeman et al. explain that through SNA, program administrators can understand the various levels at which they engage the community through such aspects as the frequency of interaction. The arising question is whether this constant interaction with field officers/implementers improves the promoters' capacity to undertake promotional activities and ultimately enhance adoption rate in the community.

Routine monitoring has a positive effect on program personnel. More frequent routine monitoring makes those involved in the project or programs feel more involved in the programmatic processes (Enchasii, 1996). However, this positive effect may not be the same for community volunteers. Despite this, Woldie et al (2018) established that modality and frequency of monitoring determine the motivation of community volunteers to undertake promotional activities. Woldi et al (2018) stated the effect of routine monitoring is dependent on other aspects such incentives or rewards and the level of involvement in the project or program. In a project where community volunteers are involved in activities such distribution of products, frequent

monitoring may improve their work. In contrast, in a project where volunteers are less involved, frequent monitoring may have no effect on their capacity (Enchasii,1996).

In program M&E process, community engagement improves a community's capacity to address its issues while at the same time ensuring that implementers understand the community's priorities (Ahmed & Palermo, 2010: Kennedy et al., 2009). The operating principle is that community engagement is a process that requires power sharing and flexibility in pursuing goals within the cultural context of the community, thus underscoring the role of promoters. However, does frequent monitoring of the role of the promoter in achieving the program's objectives influence their (promoters') capacity to encourage and motivate the community to embrace and increase the use of chlorine to treat their water? This is one of the questions that was pursued in this study.

2.4.3 Effect of monitoring frequency on dispenser empty rates

Sciortino (1999) conducted a study to explore how water pollution can be prevented to make it suitable and safe for human consumption, as well as support human economic activities such as the rearing of fish. The author noted that the frequency of bacteriological examination ought to be increased when two conditions manifest: whenever variation in conditions evince an increased possibility of contamination; and whenever there is deterioration in the quality of the water supplied. This ensures that hazards and threats to human health are not only identified but also that remedial actions are taken.

A study by Pickering et al. (2019) in Bangladesh established that children who used and drank chlorine-treated water had less diarrhoea in comparison to those who did not. The study also

established that at the point of collection at treatment taps, in 83% of the time, drinking water had detectable free chlorine residual as compared to 0% at control taps.

During formulation of M&E system, the level of monitoring may be guided by numerous aspects. However, Alotaibi (2011) suggest that with program with constant supply products to realise expected outcome frequent monitoring of the distribution of materials is critical. From routine monitoring reports, the program is able to address any challenges in the supply chain of the materials. This is emphasized in Dispenser for Safe water program report by Erin Worsham, Robyn Fehrman, (2017), which highlighted frequently monitoring as a critical steps to ensure that community promoters frequently refill the dispensers.

In this case, the authors cite the frequency of monitoring as a significant determinant to detecting chlorine residual and prevention of diarrhoea, particularly among children. The study was designed in such a way that it included baseline data collection, which was followed by both randomisation and intervention delivery. Additionally, a follow-up data collection was conducted at up to 14 months (and at a frequency of measurement of 2-3 months). However, although the authors cite the frequency of monitoring as a significant determinant in ensuring safe water, they did not address the effect of other factors such as the promoters' capacity to undertake promotional activities or the efficiency of empty rates in the community.

2.5 Theoretical framework

In this study, the researcher employed the Dynamic Capability Theory to help explain the parameters under investigation. Dynamic capability is the program's ability to integrate, reconfigure internal and external resources and functional competencies to deal with the environment that is always evolving (Teece et al, 1997). It is the program's ability to consistently

integrate, configure, recreate and renew the capabilities that are mostly important, reconstruct and upgrade capabilities in response to evolving environment to retain and sustain comparative advantage (Wang and Ahmed, 2007; Teece et al., 1997). Dynamic capability is the program's potential to systematically solve problems, created by its propensity to sense opportunities and threats, to make timely and to change its resource base (Barreto, 2010).

Creating dynamic capabilities relates to the environmental and technological status that the program has established, the choice of organizational form and the ability to strategize. This theory will be of importance to this study in anchoring how the programs is able to generate sufficient resource capacity in terms of personnel, through promoters, and availing sufficient funding to monitoring and evaluation. In addition, this theory helps in conceptualization of how the program deals with external issues such as regulatory, supply of materials and compliance in enhancing its M&E systems.

To justify its adoption in this research, the dynamic capabilities theory, i.e. program's ability to reconfigure and adjust M&E designs to improve performance informed the objectives of this study. In context, a program may change monitoring and evaluation designs to deal with challenges or failure to achieve the intended impact. For instance, Dispenser for Safe (DSW) has implemented different frequency of monitoring, which may have affected program's performance in terms of key indicators such as uptake of chlorine, household and promoter's engagement as well as the promoter's motivation to carry out promotional activities. Therefore, the nexus between M&E designs and program outcomes promoted by the dynamic capability theory will be used to make inferences on how frequency of monitoring affects the selected key indicators. Further, dynamic capability theory also helped in conceptualizing how programs or projects deal with changes in monitoring and evaluation systems.

2.6 Conceptual Framework

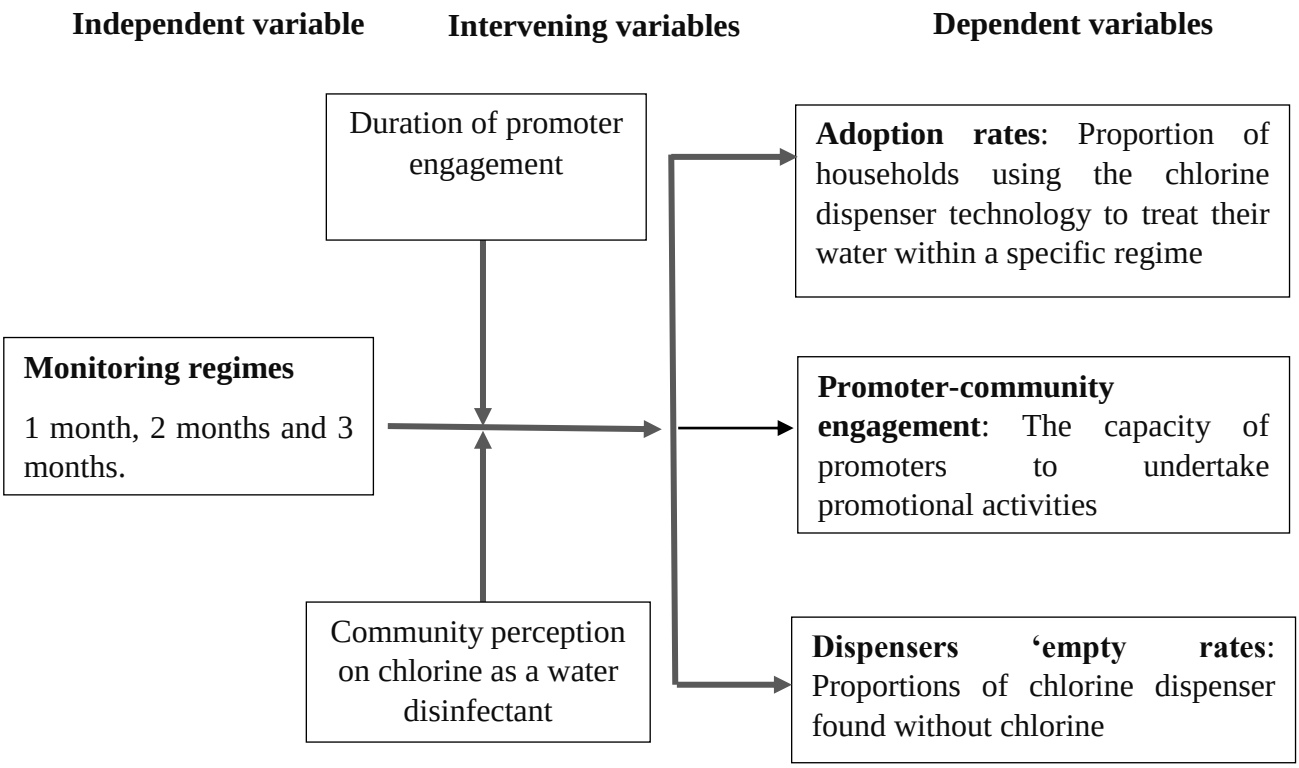

Figure 2.2: Conceptual framework

The conceptual framework indicates the relationship between the independent variables and the dependent variables. The study evaluated whether frequency of monitoring through the three regimes affect the proportion of households using dispensers, dispensers' empty rates and promoter's community engagement. Therefore, the frequency of monitoring is the independent variable while the rate of adoption, dispensers' empty rate and promoter's community engagement and rate of adoption form the dependent variables (Figure 2.1). The framework also highlights the indicators used to measure the variables. In other words, the framework seeks to establish when changing the frequency of monitoring has effect on the level of chlorine adoption, dispenser empty rate and promoter-community engagement among the DSW target population.

2.7 Concluding summary

From the reviewed literature, it is clear that there is low adoption of clean water practices or sanitation in rural Western Kenya, despite extensive awareness of the dangers that accompany the drinking of unsafe water (Kremer, Miguel & Mullainathan, 2014). The literature has also shown that children who used and drank chlorine-treated water had less diarrhoea in comparison to those who did not (Pickering et al., 2019), indexing chlorine uptake as a solution to improving drinking water quality. Although the use of promoters to encourage the use of chlorine among members of the community has been cited as a solution (Goldberg-Freeman et al., 2007; 2010; Yates et al., 2016), the literature has not explicitly described how this can be achieved. Additionally, while the literature has identified frequency of monitoring as a significant determinant towards safe water, it has not adequately evinced how the promoters' capacity to undertake promotional activities or the level of chlorine dispenser emptiness in the community affect program outcomes. Thus, the extant literature has not laid bare the influence of frequency of monitoring on program's outcomes, which underpins the gap this study seeks to bridge.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter focuses on the study area, explains the research design, study population and sampling, data collection methods, data analysis and results presentation. It also addresses issues of reliability and validity, as well as research ethics.

3.2 Research Design

This study adopted a comparative cross-sectional research design. Comparative cross-sectional research studies what is happening in a group at a particular time. It allows researchers to compare many different variables in existence in a population at a given point in time. Therefore, this research design is deemed suitable because the study involves examining different aspects of the population at given study period. The design provided the researcher with a holistic, in-depth insight and generalized understanding of the impact of monitoring frequency on the Dispenser for Safe Water program outcomes.

3.3 Population and Sampling

For this study, Dispenser for Safe Water (DSW) household monitoring data was used to establish the effect of frequency of monitoring on program output. The household survey in Appendix 1was used to collect the monitoring data. This constituted the study's main secondary data source. The researcher had express permission from the program management to access the data for purposes of this study (Appendix 2). From the data, there are 4,468 dispensers in Kakamega County which are grouped according to program's offices: Chavakali (2778), Matunda (1455), and Ugunja (235)[1]. Kakamega County is one of the counties where dispensers were installed during the program inception. This made it ideal for this study as it has experienced the different

[1]Based on program demarcation, there are dispensers located on the border of Ugunja and Kakamega which are served by the Kakamega office.

monitoring regimes covered under the study. Between January 2013 to December 2019, 15,336 households were monitored and were considered in this study; three-month regime (1,504), two-month (4,248) and bi-monthly (9,584) households participated in DSW monitoring process.

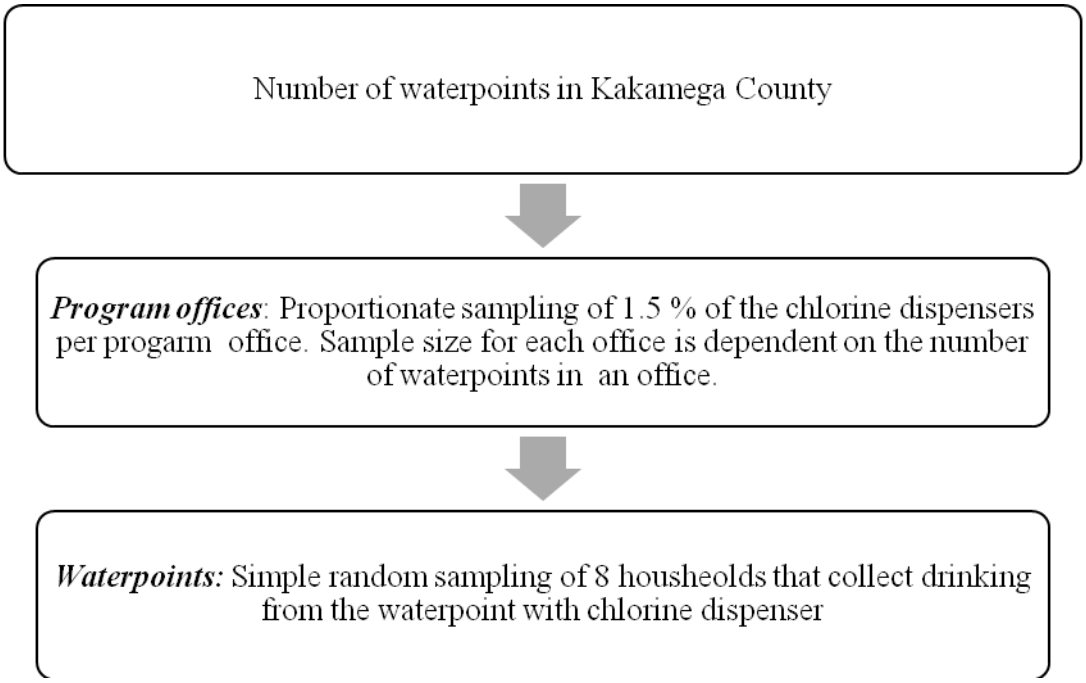

Figure 3.1: DSW sampling plan

In terms of the data collection protocol, DSW employed multi stage-sampling where dispensers were first stratified into offices of operation and a sample of 1.5% selected from each office using probability sampling without replacement. Therefore, each dispenser had an equal chance of being selected. Eight households were randomly sampled within each selected dispenser and visited for monitoring. The sample size per water point is informed by the practicability of collecting data from households using the dispenser as well as the cost of monitoring on the same day.

With respect to primary data, the study utilised Key Informant Interviews (KII) as the central method for primary data collection. Seventeen key informant interviews were used to collect

qualitative data i.e. 5 from the management team and 12 community representatives (promoters). According to Kumar (1989), KII entails interviewing a selected cluster of respondents who are likely to provide the researcher with the required information, ideas, as well as insights on a particular subject. The five program management team members account for the total population of those that were involved in implementation and M&E across the three regimes. To select the promoters for the key informant interviews, the following criteria was used. First, one should have experienced the three monitoring regimes thus served as a promoter for at least six years. Second, one ought to be a lead promoter i.e. a promoter in charge of other promoters in the nearby water points. Lastly, distribution across the study area was also considered where simple random sampling was used to select a promoter per sub county. Further, logistic and financial constraints determined the sample size. The key informants were interviewed to establish their understanding of how monitoring of DSW program influences the program's outcomes. The study intended to gain insights from management teams pertaining to what informed the transition to different monitoring regimes and how this affected program's outcomes. Promoters provided their own understanding of effects of frequency of monitoring on program outcomes.

3.4 Data Collection Methods

This study utilized both primary and secondary data. A combination of both primary and secondary data provided the requisite information to address the research questions as well as reduce limitation that comes with secondary data alone (Sandelowski, 2000). A structured interview guide was used to collect data from the key informants (**Appendix 3** for DSW management team and **Appendix 4** for community promoter). A summary of the characteristics of the key informants is presented in Table 3.1. All the management personnel that were

involved in implementation and monitoring of DSW program in Kakamega County and have been in Evidence Action during transition into different monitoring regimes were interviewed.

Table 3.1: Characteristics of Key Informants

KI No.	Role (in M&E development)	Designation	Subcounty	Village
1	Overall lead-program strategy development	Regional director	-	-
2	Program implementation	Program manager	-	-
3	Program implementation	Coordinator	-	-
4	Technical advisor	M&E lead	-	-
5	Technical advisor	Research and design manager	-	-
6	Community engagement	Promoter 1	Mumias West	Bumini
7	Community engagement	Promoter 2	Likuyani	Misemwa
8	Community engagement	Promoter 3	Lugari	Mwambuli
9	Community engagement	Promoter 4	Navakholo	Situkhumi
10	Community engagement	Promoter 5	Matungu	Mirere
11	Community engagement	Promoter 6	Ikolomani	Usulu
12	Community engagement	Promoter 7	Malava	Ikoli
13	Community engagement	Promoter 8	Mumias East	Bubere
14	Community engagement	Promoter 9	Butere	Mutoma
15	Community engagement	Promoter 10	Khwisero	Eshirali
16	Community engagement	Promoter 11	Shinyalu	Shinyalu
17	Community engagement	Promoter 12	Lurambi	Mwivona

3.5 Study Area

Kakamega County is one of the 47 devolved units in Kenya's administrative and political structure. The County is bordered to the North and West by Bungoma, Busia and Siaya Counties, and to the South and East by Vihiga and Nandi Counties. It is the most populous county in western Kenya, according to the 2019 national population and housing census. It is the second largest county by population nationally, with a population of 1,867,579 persons. The county covers an area of 3224.9 square kilometres. This implies that it has a population density of 579/kilometre squared. Approximately 57% of those who live in the county live below the

poverty line (KNBS, 2010). The distribution of chlorine dispensers in the county and sub-counties is shown in Appendix 5.

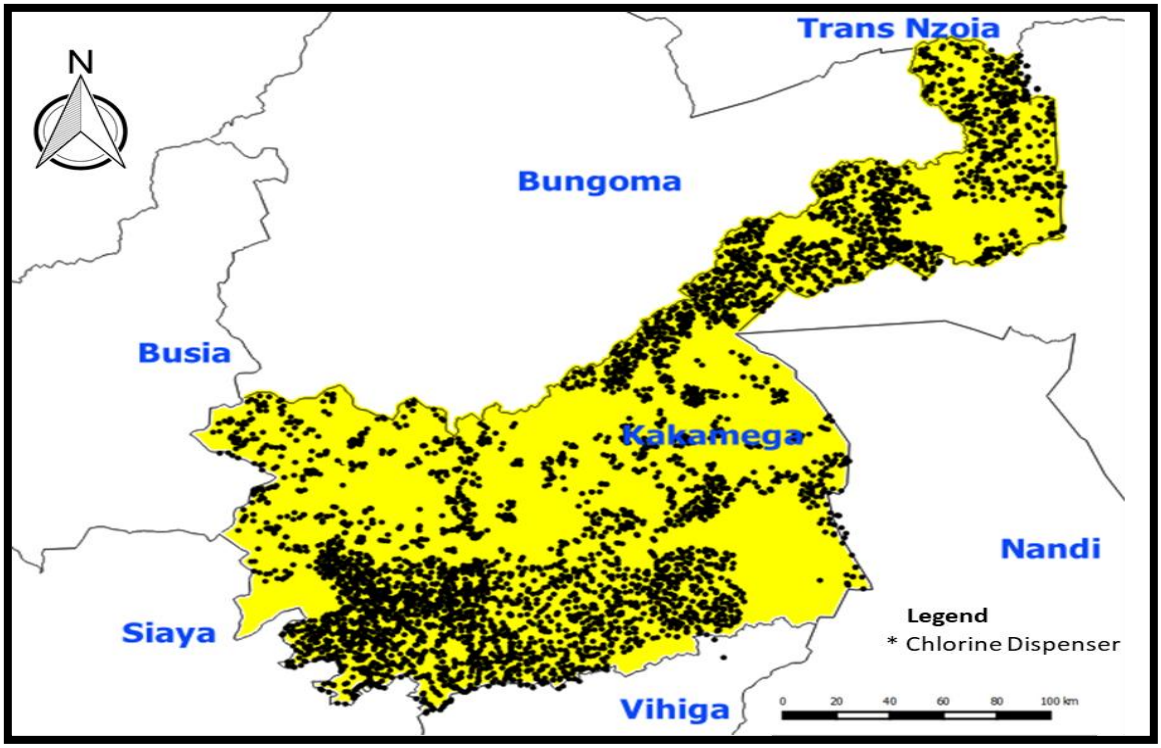

Figure 3.2: Chlorine dispensers' distribution in Kakamega County

3.6 Validity and Reliability

Validity is the degree of accuracy and meaningfulness of inferences made based on the results obtained (Mugenda & Mugenda, 2003). Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials (Leedy & Ormrod, 2001). For purposes of reliability and validity, a pretesting was carried out to 5 colleagues and 5 promoters who were not part of the study. The results were evaluated and adjusted accordingly to capture the required data for the study. The data collection instruments were verified by the supervisor. Additionally, opinions of the DSW management team was sought to judge whether or not the instruments reflect the known content.

3.7 Ethical Considerations

While research aims to build on knowledge, all the activities relating to this study were structured in a way to protect the respondents from harm. As such, several ethical principles were adopted so as to adhere to ethical and legal standards. Authorization was sought from Evidence Action management to use their data (appendix 2). The key informants were made aware of the purpose of the research. Similarly, anonymity of the respondents was ensured in order to protect them from harm by not indicating their names. Additionally, information from secondary sources was adequately cited and referenced using the APA referencing style.

3.8 Data Processing and Analysis

The researcher performed both qualitative and quantitative analysis on the collected data. The analysis of quantitative data was carried out through descriptive and inferential statistics which included frequency, mean, standard deviation and percentages. In addition, regression analysis was done on the quantitative data to test for significance of effect of frequency of monitoring on adoption of chlorine dispensers as a new technology to treat drinking water, the level of dispenser empty rates and promoter's capacity to undertake promotional activities. Analysis of variance (ANOVA) was used to compare means and proportions in different monitoring regimes.

Qualitative data analysis involves the idea of using themes and categories that serve to pull together and give meaning to a series of otherwise discrete events, statements, and observations in the data (Charmaz, 1983). Thus, the collected data was analysed using themes reflecting the research objectives presented in the form of texts and verbatim quotes.

CHAPTER FOUR

RESULTSAND DISCUSSIONS

4.1 Introduction

This chapter presents the analysis and findings that will address the three objectives. Specific objectives are: effects of DSW program monitoring frequency on proportion of households using chlorine as a disinfectant, number of chlorine dispensers reported to be empty, and the level of interaction between community members and promoters. The chapter is divided into two parts. The first section is the description of performance of DSW program key indicators across the monitoring regimes and comparison of program performance across the regimes. The comparison was done using multiple regression model and Analysis of Variance (ANOVA) at 95% level of confidence. In addition, the findings from key informant interviews are also presented. The second part entails discussion of effects of frequency of monitoring on selected key indicators in line with the study's specific objectives.

4.2 DSW program performance and comparison across monitoring regimes

The percentages of the selected key indicators were analysed and tabulated below (Table 4.1 below). The percentages indicate performance of a given indicator in a given monitoring regime. For both the level of chlorine adoption and promoter capacity to undertake promotional activities, the program aims to maintain high percentages. However, the program aims to have low levels of dispenser empty rates. As such, a monitoring regime with the highest level of chlorine dispenser adoption, low dispenser empty rates and high numbers of promoters undertaking promotional activities is the preferred regime. With regard to qualitative data from DSW management team and community promoters, thematic analysis was carried out (Appendix 6).

Table 4.1: DSW program performance across monitoring regimes.

Program indicators	*One-month regime*	*Two-month regime*	*Three-month regime*	*Overall (N=15,336)*
Percentage of households whose drinking water tested positive for chlorine residual during the monitoring process	37.8%	38.5%	25.3%	37.9%
Percentage of households that indicated to have found the dispensers empty in the last 30 days preceding the monitoring interview	7.4%	14.3%	22.0%	10.1%
Percentage of households that indicated the promoter talked to them about the dispenserin the last 30 days preceding the monitoring interview	21.2%	20.5%	33.6%	21.0%

4.3 Effect of monitoring frequency on community's adoption of chlorine dispensers

During the monitoring visits, households are requested to provide drinking water to test for presence of chlorine residual. Those that test positive for chlorine residual are assumed to have dosed their water using the dispenser at the water point. The study's findings indicate that the two-month monitoring regime (38.5%) is the best in terms of chlorine usage as a method of disinfecting drinking water followed by one-month regime (37.8%)and lastly three-month regime at 25.3% (See Figure 4.1 below).

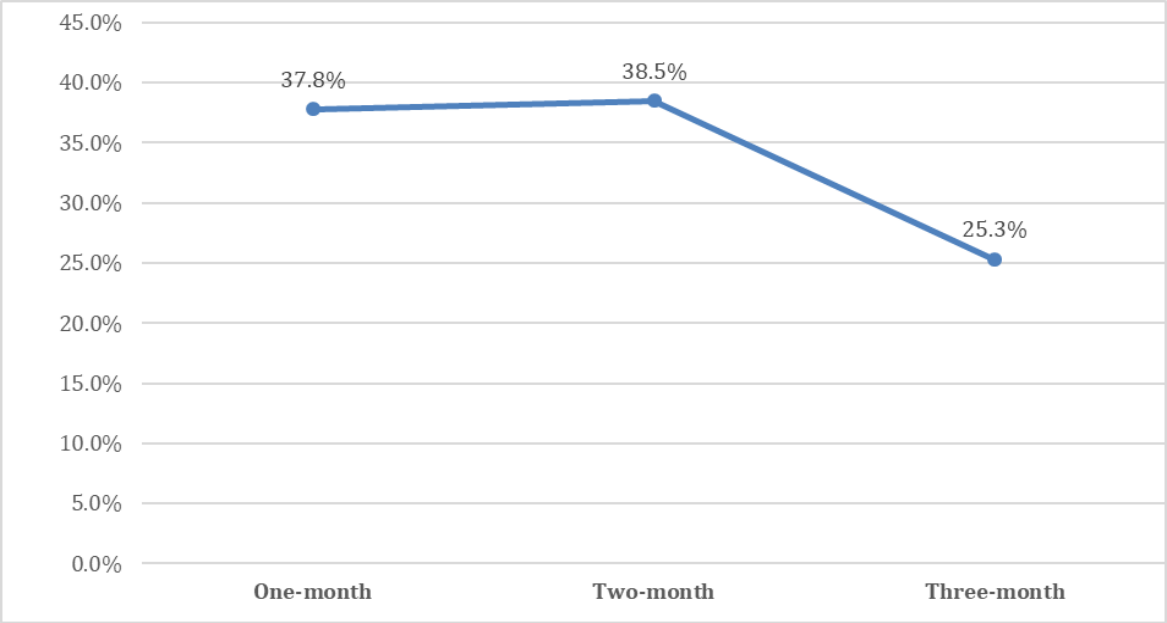

Figure 4.1 Percentage of households using chlorine to disinfect their drinking water

The regression model was used to establish the significance of effects of shifting to different monitoring regimes on the level of chlorine adoption. The regression results were generated and presented in (Table 4.2 below).

Table 4.2: Regression analysis of effects of monitoring frequency on community's adoption of chlorine dispensers

			F(2, 15333) = 5.49, Prob>F = 0.0041			
Monitoring regime	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Base (One-month regime)						
Two-month regime	.0074	.00815	0.90	0.367	-.00863	.02334
Three-Month regime	-.1242	.03991	-3.11	0.002	-.2024	-.0460
Constant	.3776	.00495	76.20	0.000	.3678	.3872

From the regression model, there is no significant change in the level of adoption of chlorine dispenser when the frequency of monitoring shifted from one-month to two-month regime the p value was greater than 0.05 ($p=0.367$, $p>0.05$) at 5% level of significance. However, there is a significant change in adoption of chlorine dispenser among the target population when frequency of monitoring shifts from one month to after every three months ($p=0.002$, $p<0.05$). If frequency

of monitoring is changed from one-month to three-month regime, the level of adoption is likely to decrease by between 4.6% and 20.2%, from the confidence interval presented in Table 4.2 Above. In addition, comparing the chlorine dispenser adoption across monitoring regimes, in the regression model (in Table 4.2 Above), frequency of monitoring has significant effect on the level of adoption of chlorine dispenser among the target population (F (2, 15333) = 5.49, Prob>F = 0.0041). This was also noted by several key informants as captured in the following quotes.

> *"Frequent monitoring, that is one month and two-month monitoring, leads to increased follow up on key performance indicators that would effectively guide the program on how to make informed decisions that would result to increase in the number of households using the dispenser. For us, the more frequent the regime, the better." (KII 2, Program Management Team)*
>
> *"Our program teams, upon receiving the regular two-month monitoring reports, focus on the recommendations to improve chlorine uptake amongst the target communities. This way, we feel we can monitor the program outcomes more closely" (KII 4, Program Management Team)*
>
> *"The two month regime provides program teams with sufficient time to take the necessary action based on recommendations made on the M&E reports" (KII 1, Program Management Team)*

The above excerpts from the key-informant interviews shed some light on how frequency of monitoring affects the level of adoption among the target population. As it can be seen from above quotes, the information derived from frequent monitoring, either one-month or two-month monitoring led to identifying challenges that target population face when using chlorine dispenser and prompting informed and timely solutions to address these challenges. Thus, timely response was attributed to increased adoption during the one-month and two-month regimes.

In addition, promoters attributed a positive reception of the program by community members to the prolonged presence of program personnel in the community (which occurs during more frequent monitoring regimes). This mere presence contributed to increased likelihood of

community members using the dispenser technology, hence increased dispenser adoption. As part of the routine monitoring activities, program staff are also tasked to educate community households on the benefits of using chlorine dispenser after the monitoring interview. Therefore, a more frequent monitoring regime is more likely to improve the level of chlorine dispenser adoption of the target population as more awareness is created among the target population. This is captured in observation made by one of the community promoters, thus:

> *"Monitoring every month increased the number of households using the dispenser. This is because DSW program staff also talk to households [after the interview] on the importance of treating water with chlorine from the dispenser. For me, this is very good because when I go there next time, the households don't ask me many questions" (KII 6, Community Promoter)*

4.4 Effect of monitoring frequency on the level of dispenser's empty rates

To sustain chlorine usage among target population, dispensers are expected to be refilled frequently. To assess the accessibility of chlorine by community members, the respondents were asked whether they had found the dispenser empty in the one-month period preceding the interview.

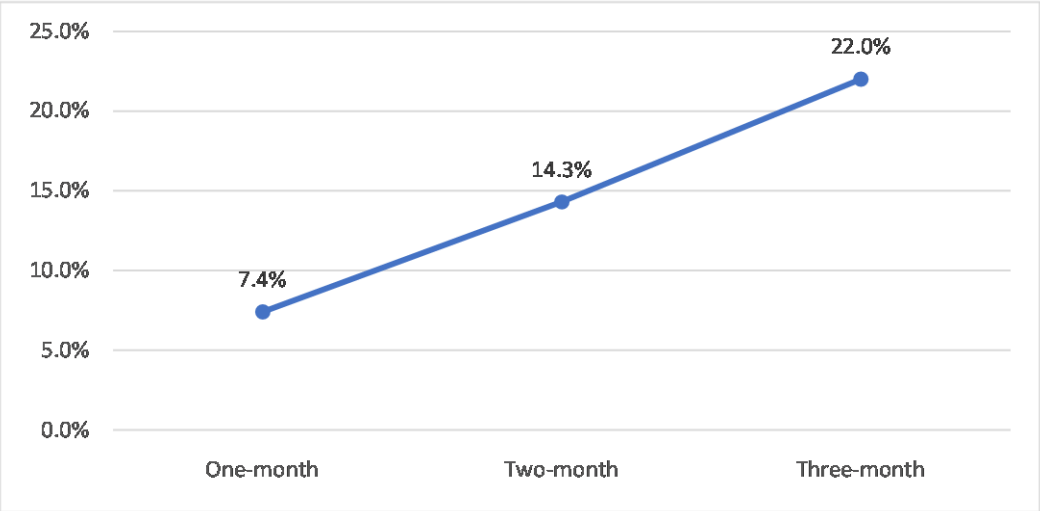

Figure 4.2 Percentage of community households reporting dispenser empty rates

The best performing regime was during one-month regime with only 7.4% of the dispensers reported to be empty followed by two-month regime with 14.3%. The three-month regime was the last with the highest dispenser empty rates (Figure 4.2 Above).

The regression model was used to establish the significance of effects of shifting to different monitoring regimes on dispenser empty rates. The regression results were generated and presented in (Table 4.3 below)

Table 4.3: Regression analysis of effects of monitoring regime on dispenser empty rates

			F (2, 14670) = 102.12			
			Prob>F = 0.000			
Monitoring regime	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Base (One-month regime)						
Two-month regime	.0693	.0051	13.55	0.000	.0593	.07934
Three-Month regime	.1460	.0263	5.55	0.000	.0944	.1974
Constant	.0738	.0032	23.36	0.000	.0677	.0800

It is evident from the regression model (Table 4.3 above) that there exists an inverse relationship between frequency of monitoring and chlorine dispensers' empty rates ($p=0.000$, $p>0.05$). In other words, shifting from monthly to two-month monitoring

increase the dispenser empty rate by between 5.9% to 7.9% and by between 9.4% to 19.7% when monitoring is done after three months (Table 4.3 Above). Therefore, with frequent monitoring chlorine dispensers are refilled more often as compared to when monitoring after every two or three months ($F(2, 14670) = 102.12$, $p = 0.000 < 0.05$).

This finding was supported by several key informants who indicated that frequent monitoring ensures timely response when the dispenser gets empty or broken.Sample the following excerpts from the key informant interviews:

> *"DSW staff start by checking the water point and dispenser during their visit. They inform me when the dispenser is empty or broken, just in case I am not aware. If I have chlorine in stock, I refill immediately; if not, someone is sent from the office to bring chlorine or to repair the dispenser within a few days."(KII 8, Community Promoter)*
>
> *"By switching to monthly monitoring, we were able to identify challenges and develop immediate solutions. For instance, monitors were encouraged to request the promoters(s) to refill the dispenser every time they found it empty." (KII 1, Senior Manager, MLIS)*
>
> *"Monitoring frequently enables the M&E team to share real time information with program staff who in turn focus on addressing the issues raised, e.g. empty dispensers due to lack of chlorine. This ensures that the dispensers have chlorine all the time." (KII 2, Associate, Field Monitoring)*

From the above quotes, we can see that community promoter's motivation to refill chlorine dispensers was higher when the monitoring was done more frequently (during one-month regime). The high program performance in terms of supply of chlorine to community and promoters refilling the dispensers is therefore attributable to increased monitoring frequency, which triggers immediate solutions derived from routine monitoring data. It is little wonder therefore that promoter engagement, the rate of chlorine dispenser being empty, and using chlorine as a method of making water safe for drinking was found to be different across the three monitoring regimes (See Table 4.1 above). The P-values are below the level of significance

(5%). We can, therefore, conclude that with regard to program supplies to target population, more frequent monitoring is preferred due to reduced time it takes in to respond to challenges in the product supply-chain.

4.5 Effect of monitoring frequency on community promoter's capacity to undertake promotional activities

Promoter community engagement is the proportion of community households that indicated the promoter talked them about the chlorine dispenser in a period of 30 days prior to the interview during monitoring process. In terms of promoter's capacity to undertake promotional activities, the lowest performance was recorded during one-month (21.2%) and two-month (20.5 %) regimes. Most promoters were found to engage more during three-month monitoring regime (33.6%). (See Figure 4.3 below).

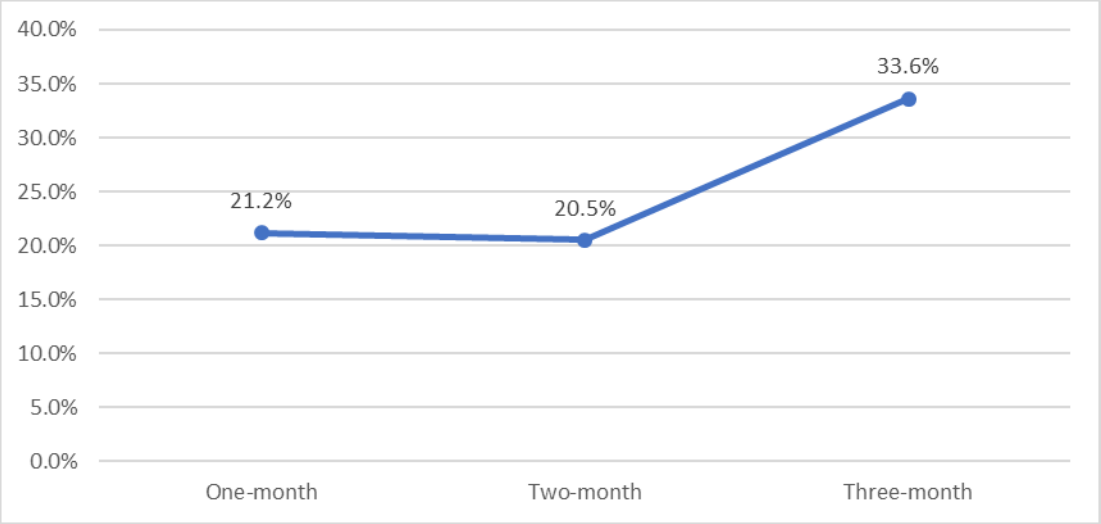

Figure 4.3: Percentage of community respondents who indicated that the promoter talked to them about the dispenser

The regression model was used to establish the significance of effects of shifting to different monitoring regimes on the promoter's capacity to undertake promotional activities. The regression results were generated and presented in (Table 4.4 below)

Table Error! No text of specified style in document.**.1: Regression analysis of effect of monitoring frequency on promoter's capacity to undertake promotional activities**

						F(2, 14952)= 7.11
						Prob>F = 0.000
Monitoring regime	Coef.	Std. Err.	t	P>t	[95% conf.	Interval]
Base (One-month regime)						
Two-month regime	-.0064	.0069	-0.92	0.356	-.0199	.0072
Three-Month regime	.1241	.0347	3.58	0.000	.0560	.1921
Constant	.2117	.0042	49.86	0.000	.2033	.2200

From regression model (See Table 4.4 above), there is no significant effect on promoter capacity to perform promotional activities when shifting from one-month to two-month regimes, (p=0.356>0.05). Nevertheless, shifting from one-month to three-month monitoring regime has significant effect on the promoters' capacity to encourage households to use the dispenser (p=0.000< 0.05). Hence, shifting from monthly monitoring to three-month monitoring may increase the proportion of promoters engaging community on the use of chlorine dispenser by between 5.6% and 19.2%. There is a significant effect of frequency of monitoring on the level of promoter-community engagement (F(2, 14952)=7.11, p=0.000 <0.05).

4.6 Discussion of the effects of frequency of monitoring on DSW program outcomes

Monitoring programs at frequent interval is a strategy used to determine the program's or project's progress or impact. Enshassi, (1996) underpins the importance of frequent and timely monitoring of a program in order to achieve the expected outcome. This study sought to understand the effect of frequency of monitoring on program outcomes using Dispenser for Safe Water programs' in Kakamega County. The key indicators considered included: 'chlorine uptake in the targeted population', 'level of dispenser empty rates', and 'promoter's capacity to undertake promotional activities. First, chlorine uptake is the proportion of households who their drinking water tested positive for chlorine residual during households' interviews. Second, chlorine dispenser empty rate is the proportion of households that indicated to have found the dispenser empty in a period of 30 days prior to the interview. Lastly, promoter capacity to undertake promotional activities is measured by the percentage of household respondents who indicated that the promoter talked to them about the dispenser in a period of 30 days prior to the interview.

Improved and frequent monitoring of any water, sanitation and hygiene technology augments its adoption among the locals. This is so since the monitoring data is used to inform the program decisions and opportunities to adjust strategies, thus contributing to improved results/outcome. This study established that frequency of monitoring affects the level of adoption of water treatment in the community. Adoption of chlorine from the dispenser to make water safe for drinking was higher during one-month and two-month regimes, as compared to the three-month regime. The findings agree with what Schwemlein, et al (2016) asserted that frequent monitoring leads to improved results since the information collected informs decisions. Bartram et al, 2014; Fisher et al 2015 & Jordanova et al (2015) indicate that frequent monitoring improves the quality

of data that yield valuable and insightful decisions and strategically realigns the program with community expectations and beliefs hence reducing misconceptions which results to high adoption of new technology. The results also support the findings from Kremer, Miguel and Mullainathan (2014) and Yates et al. (2016) that continuous monitoring influence the uptake of a new water treatment technology.

Further, this observation, that carrying out routine monitoring more frequently increases the proportion of community households adopting chlorine as a method of treating their water, and increases the efficiency of chorine supply (chlorine dispenser is mostly filled with chlorine) agrees with findings reported in other past studies. For instance, the findings by Enchassi (1996) that frequency of monitoring has a positive effect on the success/outcome of a program or a project. Mwangu & Iravo (2015) who evaluated local projects carried out through Constituency Development Fund (CDF) reported that frequencies in which the supervisors visited the projects had significant effects on the project's outcome/success. They observed that Constituency Development Fund Committees that monitored local programs/projects on monthly basis were more successful than those that were limitedly monitored, after more than a month. Mwangu & Iravo (2015) indicated that there is a strong correlation between monitoring and evaluation and program's/project's outcome. This is also emphasized by Lawal and Onohaebi (2010), who stated that frequent monitoring is essential and of great importance to a program because of the insights it provides resulting to an improved outcome. From a different perspective, Subramanian et al (2009) suggests the program performance, in term of key indicators, should be factored when determining the time interval or regularity of monitoring activities.

Chlorine dispenser empty rates were lower during frequent monitoring regimes that is one-month and two-month monitoring regimes, compared to the three-month regime. This suggests that chlorine supply is efficient with more frequent monitoring which triggers immediate solutions from the program implementation team.The results are in line with Pickering et al. (2019) that the frequency of monitoring is a significant determinant to detecting chlorine residual at treatment taps

In contrast, promoter capacity to undertake promotional activities increased when monitoring was done less frequently, that is during the three month monitoring regime. For programs or projects that rely on community volunteers, frequent monitoring is likely to derail their performance. This is understandable as promoters are often volunteers who need to take time off the project to attend to their own private businesses. As such, the community volunteers should be empowered in terms of capacity to ensure they become an effective asset to the program. That empowerment may take different forms, including offering some little stipend to facilitate their upkeep even as they engage in project activities.

The reduction in promoter community engagement was also attributed to the promoters' perception that household monitoring interviews were part of promotional activities hence they limit their engagement with communities to monitoring visits almost exclusively.

There is limited literature regarding the effect of monitoring and evaluation on the willingness of community volunteers to undertake promotional activities or participate in program activities. The finding of this study is therefore important in that respect. What we found was that promoter engagement increases with less frequent monitoring. In this study, this was attributed to community volunteers becoming the main source of information when there is limited

monitoring and perception that household interviews during routine monitoring are part of promotional activities with frequent monitoring. Woldie et al (2018) found that frequency and modality of supervision determines the motivation of community volunteers. Therefore, reduced promoter engagement during frequent monitoring, one-month regime, can be explained by the fact that most of volunteers were engaged as part-time personnel and could not afford to participate in both monitoring process and still carry out regular promotional activities. The results converge with the findings of Goldberg-Freeman et al., 2007 that through social network analysis, program administrators can understand the various levels at which they engage the community. For this study, the frequency of engagement is more during longer monitoring visits and less during more frequent monitoring visits.

From key informant interviews, frequent monitoring regimes increases the number of households using the chlorine dispenser in the target population and reduces number of empty dispensers. This is so because the program team is able to identify challenges the target population are facing when using chlorine dispensers and prompting informed and timely solutions. Also, the program team is able to respond in the event that chlorine dispenser(s) is reported to be empty.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the findings

Frequency of monitoring is significant in the success or outcome of a program. This is so because increased monitoring, in terms of frequency, improves the quality of monitoring data and enables timely response to program's challenges through data-driven decisions that result in positive outcomes. However, this study found that frequency of monitoring affects various program's key indicators differently. The study used Dispenser for Safe Water (DSW) program in Kakamega County as a case study. To assess the effect of frequency of monitoring on the program's outcome, i.e. household adoption of chlorination technology, chlorine dispenser empty rates and promoter (community volunteers) capacity to undertake promotional activities. The performance of the program, in terms of the selected key indicators, was compared across the three monitoring regimes. Using DSW program monitoring data, there was sufficient evidence that DSW program's performance with regard to the selected indicators was different across monitoring regimes.

Increased chlorine adoption as a method of making drinking water safe was recorded when the program was monitoring more frequently, i.e., every month. With respect to dispenser empty rates, most of the dispensers were found with chlorine during the one-month regime followed by two-month monitoring regimes. This suggests that chlorine supply is efficient with more frequent monitoring. With respect to promoter's capacity to undertake promotion activities, most community respondents reported to have talked to the promoter about the chlorine dispenser during three-month regime as compared to two-month and one-month regimes. Limited promoters' capacity to encourage community households to use the chlorine dispenser was

attributed to the fact that they viewed monitoring process as part of promotion activities. Therefore, promoters may not offer more time beyond the monitoring process for promotion when monitoring is done after every one or two months. However, an increase in promoter engagement was recorded during the three-month regime since promoters become the main program representatives in the community.

The findings that there is no significance difference in level of chlorine dispenser during one-month and twos-month regimes vindicates the program's decision to deploy a two-month monitoring regime on the basis of cost. Since promoter-community engagement and dispenser emptiness indicators are drivers of level of chlorine adoption, the change in chlorine adoption among target population during shifting from one regime to another reflects the compounded effects of other indicators.

Admittedly, using the program's routine monitoring data to assess the effect of frequency of monitoring on program outcomes may not have been absolutely accurate since the difference in performance across various regimes maybe attributable to other program aspects such as change in sampling design, budget, and use of routine data to inform program adjustments over time. However, incorporating qualitative data from DSW program's key informants to the routine monitoring data subdued the contribution of these monitoring and evaluation designs on program outcome.

The findings of this study reveal that frequency of monitoring affects the outcome of the program. However, frequency of monitoring affects DSW program outcome indicators differently. To conceptualize the connection between effects of evolution in M&E aspects on DSW outcomes the dynamic capabilities theory was employed. Contextually, applying

propositions of dynamic capability theory, changes in DSW outcome across the monitoring regimes was derived from the propensity to make timely and informed decisions from frequent monitoring reports.

5.2 Conclusions

The study concluded that frequency of monitoring significantly affects the level of chlorine adoption. Specifically, shifting from one-month to three-month regime may reduce the level of chlorine dispenser adoption by between 4.6 % and 20.2 %. Frequent monitoring improves the level of chlorine adoption among the target population. However, it was also established that change in adoption becomes significant when frequency of monitoring is increased by more than one month. This was attributed to timely decisions from routine reports to address the programmatic challenges. It is concluded that frequently monitoring increases the level of adoption of water treatment technology.

In terms of chlorine supply, changing the frequency of monitoring even by a single month affects the rate of chlorine dispenser emptiness. The level of chlorine dispenser emptiness increased by 6.9 % and 14.5 % when the programs shifted from one-month to two-month and three-month regime respectively. From the key informant interviews, it was noted that during the frequent monitoring regime, there is constant chlorine supply and refilling of the dispenser in the event it is reported to be empty. Therefore, it is concluded that frequency of monitoring improves supply chain of products to the target population.

Promoters are assumed to be change-agents in the community by refilling the dispenser and encouraging community members to use it. Therefore, promoter performance, in terms of community engagement, is monitored routinely. From the findings, it is evident that promoters are more proactive during less-frequent monitoring regimes. Promoter-community engagement

would increase by 12.4 % in the event DSW program shifted from one-month to three-month regime. It is evident the locally-elected promoters become the main link between target population and the program. In addition, the capacity or motivation of community promoters to undertake promotional activities is reduced by monitoring more frequently.

5.3 Recommendations

Based on the findings of this study it can be concluded that the frequency of monitoring plays an important part on program outcomes. However, frequency of monitoring affects program key indicators differently. Therefore, studying the effect of frequency of monitoring on every key indicator should be carried out to realize an optimal frequency of monitoring study.

From the findings of this study, frequent monitoring of key indicators that measure on adoption of a new technology or supply of product to the target population will improve the output. However, for indicators that involve volunteers, frequent monitoring may reduce their motivation to undertake promotional activities since they may not offer all their time to volunteering. Therefore, when program implementers, donors and program monitors are developing monitoring and evaluation (M&E) systems, they should factor in what aspects of the program the indicator is collecting when determining the frequency of monitoring. Specifically, monitoring an outcome of an indicator on adoption of a new technology or supply of products should be done more frequently while indictors on volunteers should be carried out less frequently.

From the significance and contribution of community volunteers in water, sanitation and hygiene (WASH) programs, future studies should seek to improve the understanding of how frequency of monitoring affects their level of participation and motivation to carry out program activities.

5.4 Areas for further research

1. For future studies, the effects of other monitoring and evaluation designs such as sampling, budget, sample size were not factored. This may have influenced how frequent monitoring was suggested to affect specific program outcomes. Therefore, for further study, a similar study needs to be carried out on the frequency of monitoring while controlling for effect of other monitoring and evaluation (M&E) design components.

2. This study was conducted in only one location and therefore the findings may not be generalized to other areas. As such, future studies should extend to other areas to enhance generalization.

3. Future studies should assess the effect of frequency of monitoring on community-volunteers with different levels of volunteer incentives.

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APPENDICES

Appendix 1: Household survey questionnaire

Note: This tool was adapted from the DSW household survey questionnaire but only the questions that are relevant to this study are included here.

SURVEY DETAILS

1. Record site information where community member uses the dispenser
2. Obtain consent and complete questionnaire
3. Test and record Chlorine concentration in drinking water
4. Details for section 0 and 1 should be provided to the monitor before heading to the field

SECTION 0: SURVEY INFORMATION		
c002	Start time	| _ | _ |.| _ | _ |
c004	End time	| _ | _ |.| _ | _ |
c005	Today's date	| D | D | M | M | Y | Y |
c007	Surveyor ID	| _ | _ | _ | _ |
c008	Color Wheel ID	| _ | _ | _ | _ |
c011	Program	|_____|
c012	County Name	|_____|
c013	Subcounty Name	|_____|
c016	Sub-location Name	|_____| or Other |_____|
c017	Village Name	|_____| or Other |_____|

SECTION 1: WATER POINT AND RESPONDENT INFORMATION		
Field Team: Thank you very much for your hard work. please complete the following tasks: **1. Record site information where community member uses the dispenser.** **2. Obtain consent and complete questionnaire.** **3. Test and record chlorine concentration in drinking water.**		
c101	Water point Name	|_____|
c102	Water point ID	| _ | _ | _ | _ | _ | _ | _ | _ |
c103	GPS Coordinates	N°|_|_|.|_|_|_|_| E°|_|_|.|_|_|_|_|

Read the following paragraph in the respondent's preferred language and ask if he/she agrees to participate. Ask the guide to wait outside in the compound and ensure that the guide does not go to alert other compounds.		
Hello. How are you? I am [name] from DSW, a nonprofit development organization. DSW works on programs for community water treatment. This survey is of great importance to improving the program that you are benefitting from. With your help and willingness to take this survey we will be able to improve chlorine delivery and other services related to the chlorine dispenser. I'd like to talk to the person who usually collects water for your compound or the mother of the youngest child in your compound. Is this person here? Participation is voluntary, I will keep everything that you tell me entirely private and will not talk to other people about what you say. Please feel free to tell only the truth and to say anything exactly as you believe it - your answers will not affect the opportunities that you have and we will benefit more from knowing your honest opinion. If you have any questions, you can contact DSW. Would you be willing to volunteer about 30 minutes of your time to speak with me about water treatment in your compound?		
c104	Consent given?	[1] Yes [0] No →**END SURVEY**
C105	Respondent Family and Given Name	|_____| First Name |_____| Second Name |_____| Last Name
c106	How old are you	|__|__| years
c107	Compound ID from Randomized List	| _ | _ | _ | _ |_ | _ | _ | _ |_ | _ | _ | _ |

SECTION 2: GENERAL HOUSEHOLD CHARACTERISTICS		
Please complete this section of the survey when you arrive at the water source.		
c201	ASK: Where does your household regularly fetch its drinking water?	[1] From the water point with the chlorine dispenser [2] Rainwater [3] From another source
c203	OBSERVE: Choose respondent's gender.	[0] Male [1] Female

c205	ASK: What level of schooling have you completed?	[1] No school [2] Some primary school [3] Primary school certificate [4] Some secondary school [5] Secondary school certificate [6] Diploma or Bachelors [-996] Other (Specify)_____ [-999] Don't know

SECTION 3: PRIOR AND CURRENT WATER TREATMENT		
C301	ASK: "Could you give me a glass of drinking water?"	[1] Yes [0] No →***ASK c302***
C302	Reason why Not:	[1] Drinking water is finished and respondent is yet to fetch. [2] Household is locked and respondent does not have the keys [3] Refused to give water [-996] Other (specify)__
C303	Confirm: Is this the water used for drinking by household members?	[1] Yes [0] No

SECTION 6: RESPONDENT RELATIONSHIP TO THE PROMOTER - CHLORINE DISPENSER		
c601	Has anyone talked with you about the dispenser from outside or within your community in the past 30 days?	[0] No → **SKIP to *c603*** [1] Yes [-999] don't know
c602	Who has talked with you about the dispenser from outside or within your community in the past 30 days? **[Multiple Select]**	[1] CHW [2] Promoter [3] Assistant promoter (In OAF, is assistant refiller) [4] Health facility [5] Chief, assistant chief, or village elder [6] Another neighbor or relative [7] A DSW/EA staff member [8] School representative [9] Public health technician (PHT) or MoPHS Staff [10] An NGO [11] Another OAF Committee Member, Facilitator, or Field Officer [12] A community member or relative who is an OAF member [-999] Don't know

		[-996] Other Specify
c603	How often in the past 30 days have you seen the promoter?	[1] Not in the past month [2] 1-2 times per month [3] 1-3 times per week (3-15 days per month) [4] Daily or almost daily (more than 15 days per month) [5] Never ever - I've never seen or talked with this person [-999] Don't know
c604	How often in the past 30 days has the promoter told you about the dispenser?	[1] He/she hasn't told me about the dispenser in the past month [2] 1-2 times per month [3] 1-3 times/week (3-15 days per month) [4] Daily or almost daily (more than 15 days per month) [5] He/she has never ever told me about the dispenser [-999] Don't know [7] He/she hasn't told me about the dispenser in the past month
c605	How would you rate the job that the promoter is doing at refilling the dispenser and promoting its use in the community?	[1] Very good [2] Good [3] Average, just okay, or not bad [4] Poor [5] Very poor [-999] Don't know
c606	Why do you think the promoter is doing a good job? **[Please select all that the respondent mentions.]**	[1] He / she teaches/encourages me to use the dispenser [2] He / she is available when I have questions [3] He/ she knows very much about chlorine [4] He / she communicates very well [5] He / she does a good job of refilling the dispenser [6] He / she ensures that the water source is clean [-999] Don't know
c607	**ASK if *c605 >=4*** Why don't you think the promoter is doing a good job?	[1] He/she never teaches me how to use the dispenser [2] He/she is never available [3] He/she is not knowledgeable about chlorine [4] He/she does not communicate very well [5] I found the dispenser empty many times [6] The water source and the dispenser are dirty [-999] Don't know

Appendix 2: Consent letter to use DSW monitoring data

Evidence Action

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Faridah Mung'oni

P.O BOX 861 Busia

Tel: +254720611067/+254714906248

15th November 2019

1. Introduction:

This document is a formal request to Evidence Action to permit me, a current employee of Evidence Action on MLIS Department, use their data for my university dissertation.

2. Project title:

Impact of monitoring and evaluation systems on Dispenser for Safe Water program outcomes. A case study Kakamega County, Kenya.

3. Specifications

i. *Purpose of study:* This study will be conducted as a partial fulfilment of the requirements for the award of a Master of Arts degree in Monitoring and Evaluation at Maseno University. The findings can be used by the organization in making informed decisions around M&E systems. The study will focus on two key outcomes of the dispenser's program i.e. dispenser functionality and adoption. I would like to access the following data sets collected in Kakamega county since 2011 to date;
   - Spot check and chlorine delivery data collected by the program team
   - Spot check data collected by M&E team
   - Community and promoter data collected by the M&E team
   - Program reports for Kakamega County

ii. *Study timelines:* The study will take approximately 8 months. It is important to note that this is the timeframe within which I anticipate to have completed both my proposal and project.

iii. *Use of data:* The data will be used to draw a correlation between monitoring and evaluation systems and the impact the systems have on highlighted program outcomes. The data will not be used for any other purpose beside this study.

iv. *Access to data:* The final findings from the study will be archived online by the University hence accessible externally. During the study, my supervisor will have access to the final data that will inform the findings.

v. *Data security:*

The following measures will be undertaken to ensure data security;

1. Deidentifying data: Separation of personal identifiable information from the data through encryption of the identifiers data.
2. Limit accessibility to myself and the people recommended to review the reports from the study
3. Only use the data for purposes of this study and not any other
4. All data will be coded to protect respondents
5. Use existing channels within the data department to access the data.
6. Limit data access to defined scope of study

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vi. *Additional surveys/ measures to ensure their privacy*

Qualitative data maybe collected through key informant interviews. These interviews may target;

- Dispensers for Safe Water Kenya Program manager
- Area coordinators
- MLIS lead
- Other Evidence Action staff who may have worked on the program area during the said period

All target respondents will go through an informed consent process before the interview.

vii. *Potential risks of study to the organization*

Findings may not be representative given the narrowed scope of the study. It is important to note that the findings will be shared internally for perusal before being submitted to the university.

viii. Intellectual Property

I acknowledge that Evidence Action retains the intellectual property over the data and, based on any reasonable grounds, may withdraw my access to or the use of the data without a prior notice.

I ....FARIDAH M. MUHGIUHI..... Confirm that I will abide by the information provided above.

Name: ....FARIDAH MUHGIUHI..... Signature: .....Date: 5/12/2019 .

Verified by: Senior Manager MLIS

Name: ..Philip Kahuho..... Signature: .....Date: 10th Dec 2019

Approved by: Senior Director, Africa region

Name: ..Paul Byath..... Signature: .....Date: 10/12/2019.

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Appendix 3: Key Informant Interview Guide: Program Management Team

My name **Faridah Mung'oni** a post-graduate student at **Maseno University** and carrying out a study titled "**Effects of Monitoring Frequency Regimes on Program Outcomes: A Case Study of Dispensers for Safe Water Program in Kakamega County, Kenya**." You have been selected to participate in this study by virtue of being in the implementation or technical team of Dispenser for Safe Water program.

However, participation is voluntary, I will keep everything that you tell me entirely private and it will be subjected to utmost confidentiality and will only be used for academic purposes.

Your answers will not affect the opportunities that you have and we will benefit more from knowing your honest opinion.

Would you be willing to offer us about 30 minutes of your time to speak with us about Dispenser for Safe Water (DSW) program?

Background Information

Name of Key Informant: _____

Position: _____

Date of Interview: _____

1. Dispensers for Safe Water (DSW) program has transitioned from having its operational activities monitored after three months, one month, and currently after two months. What informed the decision to change the frequency of monitoring?
2. What do you think were or are the implications of changing the frequency of monitoring on the following M&E aspects of DSW program?
    a. Sampling
    b. Budget
    c. Timeliness of reporting
    d. Use of information to make informed decisions?
3. In your opinion and from programs experiences, how do different monitoring regimes compare in relation to DSW's key performance indicators i.e. adoption, promoter engagement and dispenser non-empty rates?

Thank you

Appendix 4: Key Informant Interview Guide: Promoters

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*My name **Faridah Mung'oni** a post-graduate student at **Maseno University** and carrying out a study titled "**Effects of Frequency of Monitoring Regimes on Program Outcomes: A Case Study of Dispensers for Safe Water Program in Kakamega County, Kenya**." You have been selected to participate in this study by virtue of being a promoter for this water point.*

However, participation is voluntary, I will keep everything that you tell me entirely private and it will be subjected to utmost confidentiality and will only be used for academic purposes.

Please feel free to tell only the truth and to say anything exactly as you believe it. Your answers will not affect the opportunities that you have and we will benefit more from knowing your honest opinion.

Would you be willing to offer us about 30 minutes of your time to speak with us about Dispenser for Safe Water (DSW) program?

Background Information

Name of Key Informant: _____

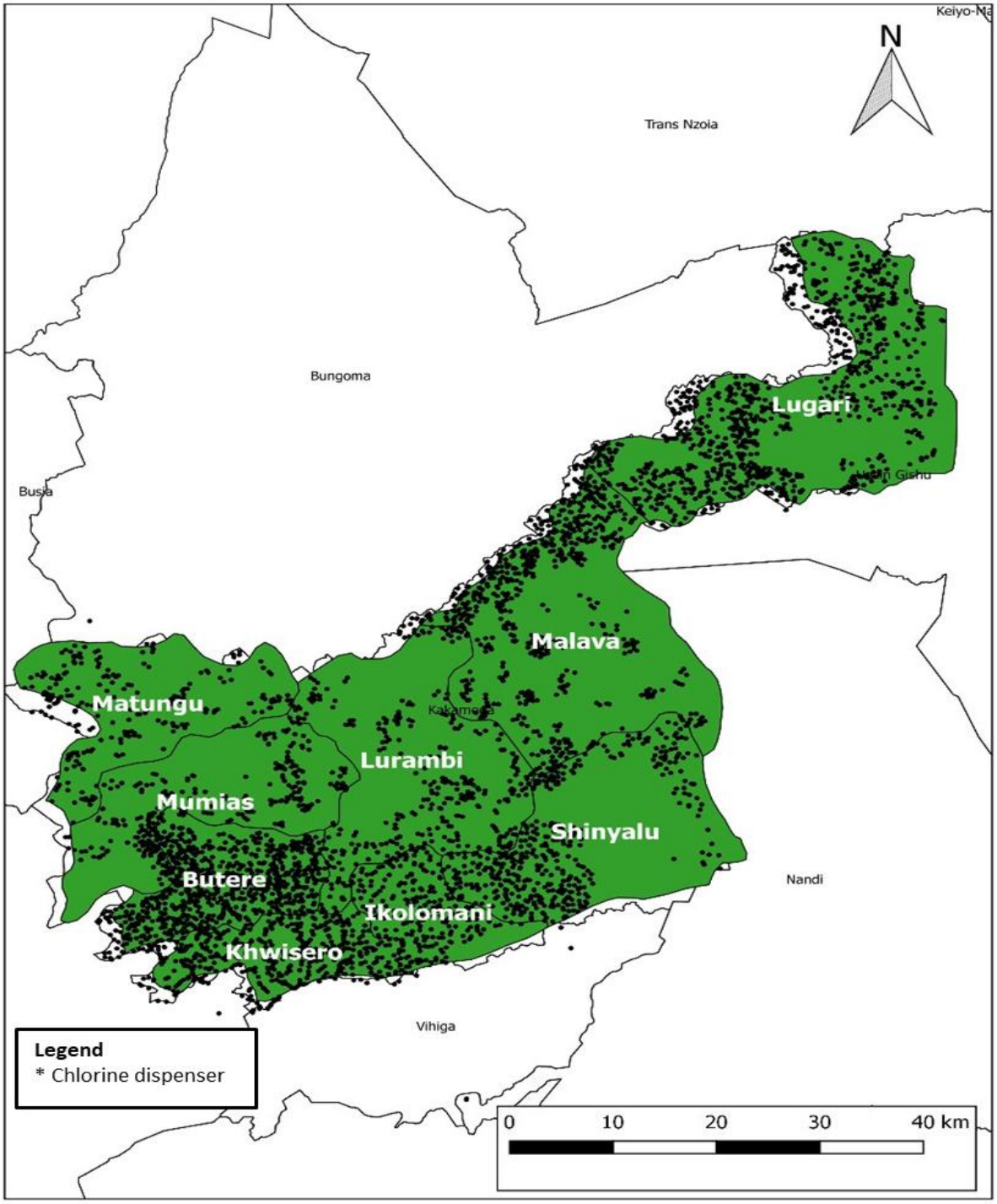
Duration of Engagement: _____

Date of Interview: _____

1.	Water point name:	
2.	Water point ID:	
3.	Are you the main promoter or assistant promoter?	[1] Main promoter [2] Assistant promoter
4.	Gender:	
5.	Age:	
6.	Are you currently working full or part time? *(Include gainfully employed or self-employed, e.g. farming.)*	[1] Part time [2] Full time
7.	What level of schooling have you completed?	[1] No school [2] Some primary school [3] Primary school certificate [4] Some secondary school [5] Secondary school certificate [6] Diploma or Bachelors

		[-999] Don't know [-996] Other (specify)
8.	ASK: Have you performed promotion activities in the past 30 days?	[0] No **→SKIP TO 10** [1] Yes
9.	Which promotional activities?	
10.	ASK: How many hours each week do you spend on your duties related to the chlorine dispenser?	| _ | _ | _ | **(Please enter -999 if does not know.)**
11.	Dispensers for Safe Water (DSW) program has transitioned from having its operational activities monitored after three months, one month, and currently after two months. Has the frequency of monitoring affected how you perform your duties as a promoter i.e. number of times you reach out to communities to encourage them to use the dispenser and/or when you refill the dispenser?	
12.	In your opinion how does frequency of monitoring affect the likelihood of households to use the dispenser?	
13.	How has frequency of monitoring affected community's perception towards Dispenser for Safe Water program?	
Thank you!		

Appendix 5: Distribution of chlorine dispensers across sub-counties in Kakamega County



Appendix 6: Themes and statements from thematic analysis

Themes and statement from thematic analysis

Themes	Statements
Reasons for changing the frequency of monitoring	-Need of restructuring program operational activities across all regions for reasons beneficial to the smooth running of activities. -Availability of funds at the time to enhance cost effective running of the program activities -Due to strain of human resources, monitoring was done after every three months -Three-month monitoring not regular enough to provide us with information that would allow us to identify areas that would need program improvements in a timely manner. -The switch from one month to two-months was made to reduce the cost of monitoring.
Implication of shifting monitoring regimes	-Impact on the sampling plan, -Sample size that will accurately give a clear picture of how to measure the programs key performance indicators -The shorter the frequency, the higher the number of samples -Budget-Cost effectiveness/efficiency, -To effectively and efficiently conduct monitoring roles, -Operational cost reduction was a major factor of consideration when monitoring regime -Timeliness of reporting -Use of information to make informed decisions.
Effects of frequency of monitoring on program outcome	-Program team on receiving the regular two-month monitoring reports focus on consistently improving adoption drivers. -Able to identify programmatic or operational problems as they occur. -Frequent monitoring affected households positively as program staff are often seen by community -Chlorine dispenser is less likely to be vandalized during one month monitoring hence increased number of functional dispensers with chlorine. -Monitoring frequently also show the existence and seriousness of the program and thus motivate people to use chlorine. -It does not affect the motivation to undertake promotional activities.