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**ASSESSMENT OF FACTORS INFLUENCING COMMUNITY
PARTICIPATION IN WATER SUPPLY SCHEMES: THE CASE OF DROUGHT
AFFECTED COMMUNITIES AT DOLLO-BAY, SOMALI REGION**

**BY
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I, Tigist Fisseha, declare that this thesis is my own original work and that it has not been presented and will not be presented to other university for a similar or any other degree award.

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APPROVAL

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ACRONYMS

ASL	Above Sea Level
CSOs	Civil Society Organizations
CSW	Community-Managed Water Supply Schemes
DRC	Danish Refugee Council
DWA	Dollo-bay Water Authority
EWTI	Ethiopian Water Technology Institute
GoE	Government of Ethiopia
GTP	Growth and Transformation Plan
IDPs	Internally Displaced People
MoH	Ministry of Health
NGOs	Non-Governmental Organizations
OOWNP	WaSH National Program
WASH	Water, Sanitation and Hygiene
O&M	Operation and Maintenance
MBCA	Mutually Beneficial Collective Action (MBCA)
WSS	Water Supply Schemes

ABSTRACT

People living in IDPs sites and drought affected areas have substantially greater need for water, sanitation, and hygiene. Their participation in community-based water supply schemes is recommended. Studies on community participated water supply projects have found that demand responsiveness and participation by beneficiaries improve project performance (Isham et al., 1994; Narayan, 1995; Isham & Kahkonen, 1999, 2002; Prokopy, 2005). The main objective of this study was to identify the factors which influence community participation in conflict-affected populations based water supply schemes in IDPs and drought affected communities in Dollo Bay Woreda of Afder Zone. This study has identified the factors which influence user participation in community-based water supply schemes in IDPs and drought affected communities at Dollo Bay Woreda of Afder Zone, Somali Regional State, using primary data. 250 respondents of total households was designated using systematic random sampling technique in an attempt to investigate respondents' attitude towards the impact community participation on the satisfaction of water supply schemes. A two stage random sampling that is selection of the Kebeles and selection of households is made. To capture the rate of participation, two forms of indices were constructed: one to measure attendance in group meetings, and the other to measure their influence on decisions. The relative importance of factors such as group and household characteristics that affect participation were analyzed using linear regression models. Of the two sets of factors, it was found that household characteristics were the most influential. The analysis shows that males actively participated in group meetings. Level of education and involvement of households in other local organizations were the other major factors affecting participation. over all in the water supply context, once the system was installed and functioning without any interruption, it was observed that households were less interested in participating in the meetings. It is households' increased water demand that mainly drives them to participate in the community-managed schemes.

Keywords: Collective action; Participation index; Populations based water supply

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Development experience over the last few decades and the increased concern of international funding agencies and Non-Governmental Organizations in the social sector have made community involvement an inevitable part of the development process. Community-based development projects assume participation of beneficiaries in the implementation and management of the schemes under consideration. Participation of beneficiaries in project implementation is supposed to make development demand-driven and effective.

Community-based development schemes have emerged as a solution to the problems faced with state management of resources. Hence, in the wake of decentralized planning processes, state governments have devolved the responsibility of providing basic necessities to local organizations. Under the new initiative of community water supply schemes, beneficiary groups (BGs) are responsible for planning, technology selection and installation of rural water supply facilities. Operation and maintenance (O&M) of the structures created in the projects is also the responsibility of the beneficiaries. The United Nations Millennium Development Goals (MDGs) for 2015 also aim to ‘reduce by half the proportion of people without sustainable access to safe water’ (UN, 2010). Community management is identified as the predominant model for achieving this objective by bringing sustainable water supplies to millions of rural people. Development experience over the past three decades has proved that demand-driven community-led approaches deliver better results than supply-driven government-led models.

Since water is a basic need, it was assumed for a long time that the responsibility of the provision of water supply should be entrusted to government. But governments’ fiscal crises, combined with structural adjustment programs, have compelled most developing countries to look for alternatives for water supply management.

Ethiopia’s Water Policy (2008) also emphasized the need for an integrated approach towards water management in the state. The state policy entrust the responsibility for regulated water use with the community. The Draft National Water Policy (2012) also advocated the efficient use of water and maximizing its value through economic instruments. Both state and national policies emphasize the

efficient use of water as a resource. However, state policy emphasizes community managed schemes for rural water supply. It is in this context that an attempt has been made to answer the question: ‘what factors affect beneficiary participation in community-managed rural water supply schemes?’

1.2. Background of the Organization

Danish Refugee Council / Danish Demining Group is a humanitarian non-governmental organization working in more than 30 countries in the world. It has been operational in Ethiopia since 2009 supporting refugees and host communities in emergency relief and rehabilitation projects in the fields of WASH, shelter construction, livelihoods, protection and mixed migration issues.

DRC fulfills its mandate by providing direct assistance to conflict-affected populations – refugees, internally displaced people (IDPs) and host communities in the conflict areas of the world; and by advocating on behalf of conflict-affected populations internationally, and in Denmark, on the basis of humanitarian principles and the Human Rights Declaration. DRC’s Horn of Africa and Yemen Division works in Djibouti, Ethiopia, Kenya, Somalia, Uganda and Yemen.

Danish Refugee Council has designed a project titled Emergency WASH and AWD response to vulnerable IDPs and drought affected communities in Babile and Gursum Woredas of Fafan Zone, and Dollo Bay Woreda of Afder Zone, Somali Regional State to contribute to the reduction of vulnerability of 47, 174 IDPs and affected host communities through extension of a permanent water supply system, installation of river intake structures, construction of elevated tanks, provisions of water treatment chemicals, construction of water distribution points, NFIs and hygiene promotion, the provision of immediate lifesaving WASH services to sanitation related diseases through improving access to sanitation facilities and organizing hygiene promotion activities and awareness sessions on safe hygiene practices. The activities were in line with the WASH Cluster’s strategy for provision of WASH services to affected populations in the Somali region.

Delivery of safe drinking water has been identified as a priority need among the target beneficiaries. With the aim of improving access to safe water supply, DRC engaged in the construction of 10 water points which were connected to the distribution pipe network in Qoloji 1 IDP site, Babilie Woreda, Fafan Zone. DRC also upgraded an existing water supply system in Dollo Bay Town and developed a river intake structure supported by a solar pump to supply water to IDP and host communities in Koraley Kebele, Dollo Bay Woreda, Afder Zone. This work significantly increased access to reliable

water in targeted areas and substantially reduced the distance required to fetch and carry drinking water. In addition to safe water delivery, points of use water treatment chemicals (AquaTabs) were distributed in Dollo Bay Woreda to increase access to safe drinking water at the household level (DRC, 2018).

The DRC project is expected to directly reach 30,593 people in Fafan Zone and 16,738 People in Dollo Bay Woreda. The action will benefit 47,174 person in the targeted Woredas of Fafan and Afder Zones, of which 51% are IDPs.

1.3. Statement of the Problem

Stakeholder engagement and participation is a popular concept in many disciplines, from environmental planning and management to international development work. In the field of safe water supply, participation is promoted as a tool for overcoming some of the major challenges to improved access to water supply, such as low demand for water supply infrastructure, poor hygiene habits, weak institutional structures and low capacity for operation and maintenance of built systems (Wright, 1997; Wood et al. 1998). Stakeholder participation in water supply planning and implementation is encouraged because it is believed that it will create demand (Wright, 1997); it will lead to a better decision-making process where the selected technologies are better adapted to the local context (WSSCC/ Eawag, 2005); and it will increase stakeholders' capacities to manage the system afterwards (Roma & Jeffrey, 2010).

For reaching the un-served in the water supply sector, the participation paradigm is now widely accepted and there is increasing promotion of collaborative design and policymaking among academics and politicians as a way to increase sustainability (Murcott, 2007).

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distributed in Dollo Bay Woreda to increase access to safe drinking water at the household level (DRC, 2018).

Although there is an abundance of empirical evidence from rural water supply and water projects showing the benefits of participatory processes (Narayan, 1995; WSP, 2007; Wicken et al., 2008), there has been little research on identifying the major factors that would hinder community participation in populations based water supply schemes, especially in vulnerable IDPs and drought affected communities. A preliminary exploration in such a context found that not all forms of participation are equally influential in delivering successful urban water supply services (Nance & Ortolano 2007). The study highlights the need to differentiate the major factors that would influence community participation and perhaps question the assumption that group leader participation is always better.

Hence, researches that assess the factors that influence community participation in water supply schemes in the drought affected areas are expected to play an important role in filling the existing knowledge gap, in terms of understanding the factors that would hinder vulnerable IDPs and drought affected communities' participation in water supply schemes. Therefore, this research contributes to fill the gap in the literature.

Moreover, further studies are needed to understand more precisely how the form of participation influences project outcomes, for example, what style of participation will increase demand and does this differ from what is needed to improve design and appropriate use of facilities?

1.4. Basic Research Questions

To achieve the above goals of this research, the following questions has been investigated:

1. What is the rate of community participation in the IDP based water supply schemes
2. What are the socio-economic factors affecting community participation in IDP based water supply schemes?
3. What demographic factors are affecting mainly community participation in IDP based water supply schemes?
4. What are the major factors influencing collective action in IDP based water supply schemes?

1.5. Objectives of the Study

1.5.1. General Objective

This study has been designed to identify the factors which influence community participation in conflict-affected populations based water supply schemes in vulnerable IDPs and drought affected communities in Dollo Bay Woreda of Afder Zone.

1.5.2. Specific Objectives

More specifically this research was intended:

- to check if there is a community participation in IDP based water supply schemes through quantifying attendance in group meetings and community members' influence on decisions;
- to identify the socio-economic factors that would affect community participation in IDP based water supply schemes; and
- to identify group and household characteristics that would affect community participation in IDP based water supply schemes; and
- to identify the major factors affecting collective actions in IDP based water supply schemes.

1.6. Definitions of Terms

WaSH is an abbreviation that stands for water, sanitation and hygiene. The acronym has become popular during the last couple of decades as the focus on providing safe water supply, sanitation and hygiene to the global population has been growing. (Note that sometimes WASH is written with a small 'a', WaSH, from water, but the meaning is the same.) (OpenWASH, 2016).

The combination of water, sanitation and hygiene into one term recognizes that the three are closely linked and should be considered together.

Water Supply:

It is the provision of water by public utilities, commercial organizations, communities or individuals. Public supply is usually via a system of pipes and pumps. In order to sustain human life satisfactorily, a water supply should be safe, adequate and accessible to all. (OpenWASH, 2016).

Safe water supply means the supply of water is free from any form of disease-causing agents. The main criteria are:

- biological aspects: the water supply should be free from disease-causing microbes and parasites.

- chemical aspects: the water supply should be free from dissolved chemicals at the level that would damage health.
- radiological aspects: the water supply should be free from any naturally occurring radioactive substances.

In addition to being safe, the water must also be acceptable to consumers by being odorless, colorless and without objectionable taste. (OpenWASH, 2016)

An ***adequate water supply*** fulfills the minimum amount of supply per person per day. The World Health Organization defines this amount as 20 liters of water per person per day. (Note that ‘per person’ is sometimes written as ‘per head’ or ‘per capita’ – they all mean the same.)

Accessible water supply is within safe physical reach from the home or institution, usually within 1 km or a 30-minute round trip.

Sanitation generally refers to the prevention of human contact with wastes, but is also used to mean the provision of facilities and services for the safe disposal of human urine and feces. Sanitation can be further classified as basic or improved sanitation.

Hygiene: the word hygiene originates from the name of the Greek goddess of health, Hygeia. It is commonly defined as a set of practices performed for the preservation of health and healthy living. Hand washing with soap or ash is the most important element, but it also includes personal cleanliness of the face, hair, body, feet, clothing, and for women and girls, menstrual hygiene.

Community:

It is defined as a group of individuals who share a common space and social, cultural, and economic milieu (Leonard & Airhihenbuwa, 1993)

Collective Action:

It has been defined as a function of individuals’ incentives to contribute to the maintenance and abide by the rules and regulations, the capacity of the community as a whole to cooperate and to manage the incentives, and the overall policy environment in which the institutions must operate (McCarthy et al., 2002: 5).

Participation:

It ranged from mere membership and attendance at BG meetings to active involvement in terms of influence in decision making and interactive participation, which has the potential to empower the beneficiaries (Agarwal, 2001)..

1.7. Significance of the Study

For the most part, the study was emphasized on assessing the factors which influence community participation in conflict-affected populations based water supply schemes in vulnerable IDPs and drought affected communities in Dollo Bay Woreda of Afder Zone. Hence, the findings of the study was anticipated to give inputs to the debate on the factors that hinder community participation in population based water supply schemes in vulnerable IDPs and draught affected areas in general and Afder Zone. In particular, to the policy makers and planners as they design development projects related to WASH and to improve the livelihood of the people at macro or micro levels. Besides, the study has produced empirical outputs for further researchers.

1.8. Scope of the Study

The scope of this study is restricted in conflict-affected populations based water supply schemes in vulnerable IDPs and drought affected communities in Dollo Bay Woreda of Afder Zone in order to assess the factors that influences community participation in community based water supply scheme. It will be designed to focus more on their demographic features, livelihood, locality, group and household characteristics and the determinant factors on their decision making.

Because of this, the study was confined to limit its scope in Dollo Bay town and Koraley Keble, both are confined in the Afder Zone of Somali Regional State.

Dollo Bay town is one of the emergency WASH project target area. The town is located on the bank of Genale River at geographical coordinates of North 0430166 and East 04206330 and an average elevation of 177 meter Above Sea Level [ASL]. The town has two main Kebeles and new IDP settlements which is under construction. The total population of the town is about 11,058 people.

The Koraley Kebele is one of the emergency WASH project target area and it is located in Dollo Bay Woreda of Afder Zone of Ethiopian Somali Regional State. The Kebele is located south east of Dollo Bay town at about 10 km and situated along the bank of Genale River at geographical coordinates of

North 0176465 and East 0463964 and average elevation of 173 meter ASL. The Kebele has IDP settlement and the total population of the Kebele including IDP's is 5581 (3360 host and 2221 IDPs) people.

1.9. Limitations of the Study

The survey in this study was conducted for less than a month. With limited time, this study focused only on the factors of that affect community participation in water supply schemes.

Secondly, this study is more quantitative and needs to be triangulation, especially from the perspective of service deliverer. Moreover, some respondents were found very doubtful, sensitive, and not willing to give information particularly regarding certain issues like those related to occupation, income, land size, and family size etc.

1.10. Organization of the Paper

This thesis has been intended to incorporate Six chapters. The first chapter of the thesis will introduce the general overview including the background of the study, which incorporates statement of the problem, objectives, basic research questions, significance of the study, scope of the study, and limitations of the study. The second chapter will deal with literature review that presents the in-depth review of the theoretical perspective of community participation in conflict-affected populations based water supply schemes in relation to socio economic impact on households and livelihood strategies of government. Chapter three will focus on the research methodology where variables to be analyzed, sampling methods, data source of the study, and sample size determination method of data analysis will be explained. Chapter 4 will discuss description of the study area and the sample households. Chapter five will explain the presentation, interpretation, and discussion of findings of the study. Finally, chapter six recapitulates the study in terms of summary, conclusion and recommendations of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Theoretical Literature Review

Worldwide, 80 percent of the people who have limited access to drinking water supplies live in rural areas (United Nations, 2010). But the sustainability of rural water infrastructure has been a critical challenge mostly due to the remoteness of rural locations and the lack of financial and technical capabilities to operate and maintain schemes in these areas. One of the United Nation's 2000 Millennium Development Goals (MDGs) was to increase the proportion of the world's population that has access to safe drinking water and basic sanitation (United Nations, 2010). While the international community has made advancements toward these goals over the past two decades, progress in rural areas is lagging when compared to urban areas (United Nations, 2011). The recent Sustainable Development Goals built on the MDGs and proposed a higher measured of access to safely managed water.

Many countries focused on construction of facilities to expand access quickly. However, inadequate attention to post construction O&M led to subsequent collapse of many of these schemes and need for further reinvestment. For instance, a 2009 Water Aid study from Tanzania found that nearly half of improved public water points in rural areas are not functioning, and 25 percent of systems are inoperable after only two years following installation (Taylor, 2009). Similar findings were found in Nigeria (Andres et al., 2016). These systems fail at such high rates in large part because sustainability of rural water systems in low- income countries depend on "the relationship of the user with the life cycle of the water systems" (Jones, 2012).

So to achieve long-term sustainability, governments and development partners started to focus on institutional arrangements that would ensure involvement of users in planning, implementation and O&M of schemes and financial contribution by users to at least cover the O&M costs. It was important to have infrastructure sustainability, as there was enough evidence that by 2025, nearly 1.4 billion people, amounting to a quarter of the world's population or a third of the population in developing countries are destined to face absolute water scarcity (Cosgrove, 2003).

Community driven projects with active beneficiary participation in planning and implementation are likely to be more responsive to the needs of the beneficiaries in creating infrastructure, giving communities control over decisions, improving service delivery, creating ownership and strengthening the capacity of the communities to undertake other development activities (Chambers, 1983; Sen, 1999; Dongier et al., 2003).

Academic literature on performance assessment of various communities driven, participatory water supply schemes shows that such projects can create effective infrastructure and improve performance of water supply schemes. Participatory-demand-driven models for provision of rural water supply has been found to be successful in delivering well-designed and functioning systems in Ghana and Peru (Brikke, F. and Bredero, M., 2003).

A study conducted in rural Kenya (Brikke, F. and Bredero, M. 2003) reveals that demand based community participation in building drinking water systems increase the community sense of ownership for the water system, and improve functioning of rural water projects. Isham and Kahkonen (1999) in their study of community driven projects in India and Sri Lanka found that greater community participation is associated with improved service delivery.

An assessment of ten community driven projects in Benin, Bolivia, Honduras, Indonesia, Pakistan, and Uganda shows that community driven projects with active beneficiary participation are likely to be more sustainable (Sara and Katz, 1997). Similarly, a more recent study in rural areas of Pakistan found that community participation is crucial for developing ownership and for ensuring long term sustainability of rural water supply projects (Haq, Hassan and Ahmad, 2014).

Several studies have also highlighted the importance of capacity development and institutional support to ensure long run sustainability of these projects. An impact evaluation of small community water systems in Bolivia funded by the Bolivian Social Investment Fund found that training and capacity development of communities are crucial for improved performance of these schemes in terms of access and availability of water (Newman et al., 2002). In Malawi, newer community driven rural water supply schemes were found to be performing better than the older ones indicating poor sustainability of the schemes due to lack of institutional support (Kleemeier, 2000). In Suriname, socially appropriate technological choice along with involvement and support of community in general and women in

particular were found to be the factors crucial for success of community driven water supply projects (Rout, Satyapriya, 2014).

While assessment of various participatory community driven water supply projects found evidence supporting their success in improving service delivery, there is very little evidence on the relative effectiveness of community driven projects compared to traditional supply driven projects. A study of rural water supply schemes from ten states (including Kerala) in India found that community managed schemes performed ‘somewhat better’ than traditional supply driven schemes (Misra, 2008).

2.1.1. Community Participation

The community, defined as a group of individuals who share a common space and social, cultural, and economic milieu (Leonard & Airhihenbuwa, 1993), plays a critical role in health related efforts. Majority of the social scientists have consistently noted that community participation generates systematic changes in the population through citizen involvement and active participation in identifying the needs of the community and in implementing initiatives for the improvement of the wellbeing of the community and its members (Eisen, 1994).

According to Merzel and D’Afflitti (2003), the rationale for the community-based approach to health promotion stems from the notion that individuals cannot be considered separate from their social milieu, and that context is interdependent with the health and lives of individuals living in the community.

Campbell and Jovchelovitch (2000) state that participation allows community members to formulate strategies that are based on the barriers they face and their perceived needs. As a result, development program messages and program implementation procedures are created from within the community, enhancing their chances of eliciting desired results. Related to this articulation is the notion of empowering the community. Communities with actively participating members are likely to perceive that they are more in charge of their lives. Hence they are also more likely to take control of their health, engage in health enhancing behaviors, and actively seek out health resources (Campbell & Jovchelovitch, 2000).

Situating a health communication model within a participatory community-based framework empowers members of the community to articulate their needs, map resources available, mobilize them in the

production of positive health outcomes, and engage in health sustenance behaviors (Dutta-Bergman, 2003).

Inherent in these conceptualizations of community participation is an underlying sense of social commitment (Dutta-Bergman, 2003; Scheufele & Shah, 2000; Tocqueville, 1948). This sense of commitment leads members of the community, and hence the community, to partake in health promoting behaviors. In a way then, a community that is characterized by a high sense of social commitment among its members (reflected in high participation) is likely to be better off in terms of practicing behaviors.

2.1.2. Community Participation as a Social Capital

Participation is depicted as central to situated learning since it is through participation that identity and practices develop. As Wenger has suggested, participation refers ‘not just to local events of engagement in certain activities with certain people, but to a more encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities’ (Wenger, 1998, p. 4; emphasis in original).

Thus, participation is not just a physical action or event (see also Clancey, 1995); it involves both action (‘taking part’) as well as connection (Wenger, 1998, p. 55). Participation brings the ‘possibility of mutual recognition’ and the ability to negotiate meaning, but does not necessarily entail equality or respect (ibid, p. 56) or even collaboration.

Social capital refers to the ability of a community to mobilize its collective resources and secure maximum gains through its network of relationships and social structures (Putnam, 1995). It is often equated with community participation and all social, collective, economic, and cultural resources to which a community has access. Dutta-Bergman (2004b) examined the role of health consciousness, measured at the individual level, in generating social capital. Dutta-Bergman’s (2004b) study demonstrated that greater health consciousness among individuals led to increased community participation, which when summed up across the community, led to positive development outcomes in communities.

Whereas Bourdieu (1993) described social capital as investment in social connections through valuable social relationships, the concept was highlighted in the scholarship of political scientist Robert Putnam

(1995). Putnam defines social capital as “features of social organization such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefit” (p. 66). According to Pilkington (2002), Putnam’s analysis of social capital had four characteristics: the existence of community networks, civic engagement, local identity and a sense of solidarity and equity with other community members, and trust and reciprocal help and support.

Coleman (1990) states that “social capital inheres in the structure of relations between persons and among persons” (p. 302). McMichael and Manderson (2004) refer to social capital as those factors that contribute to well-being and those that capture “how people use and gain from voluntary associations, interactions with others in their neighborhoods, and the contacts that friends and relatives provide” (p. 89). Operationalizing social capital in an effort to measure it has been varied. Whereas Weitzman and Kawachi (2000) operationalized social capital in terms of an individual’s average time committed to volunteering over a time period.

2.1.3. Conceptualizing Community Participation in Health Program Sustainability

The issue of health program sustainability has received attention over the past few decades as an important topic in both academic and policy literature. The concept is broadly accepted as referring to the continued use of program components and activities for the achievement of desirable or intended health outcomes beyond the initial funding period (Shediak-Rizkallah and Bone, 1998; Scheirer and Dearing, 2011). Within this discourse, the issue of what exactly is to be sustained has been a recurrent theme. From a medical or health systems perspective, of importance has been to track the long-term health effects of the program and for its institutionalization within the pre-existing structures and processes of the health system (Pluye et al., 2004; Shigayeva and Coker, 2015).

Since Alma Ata, a growing strand of literature sees community participation as an essential driving force for health program sustainability based on the assumption that working with communities can help make interventions more relevant to local priorities (Rifkin, 1986, 2014; WHO, 2002; Draper et al., 2010). However, there remains lack of conceptual clarity about how exactly community participation leads to sustainable health outcomes (Hossain et al., 2004).

An important debate in the literature has revolved around whether the aim of community participation should be to improve the efficiency of service delivery by increasing the uptake of interventions, or whether it should be linked to addressing broader structural issues of equity in healthcare (Rifkin, 2003;

George et al., 2015a). Much effort has been dedicated towards understanding community participation as a process from low levels of participation to higher levels influenced by the socio-economic and political context within which it is embedded, as illustrated, for example, by Frumence et al. (2014) in their study of participation in health facility governing committees in Tanzania. The spider-gram model developed by Rifkin et al. (1988) has been widely used to conceptualize community participation as a process influenced by different factors such as needs, leadership, program organization, management and resource mobilization, which taken together measure the uptake and sustainability of the health intervention. The model visualizes each indicator separately as a continuum from narrow to wide participation, which is then linked to the rest of the indicators to arrive at an overall assessment of how community participation influences program sustainability.

2.1.4. Collective Action versus Participation

Collective action has been defined as a ‘function of individuals’ incentives to contribute to the maintenance and abide by the rules and regulations, the capacity of the community as a whole to cooperate and to manage the incentives, and the overall policy environment in which the institutions must operate’(McCarthy et al., 2002: 5). It is argued that collective action is the activity which happens through an organization (Meinzen-dick et al., 2002) and people’s/user’s participation is a necessary condition for the success of collective action (Singh, 1992). It is observed in empirical studies that beneficiaries participating in collective action groups exerted greater control over their household decisions and displayed greater civic engagement than others (Joshi, 2012).

Studies on community participated water supply projects have found that demand responsiveness and participation by beneficiaries improve project performance (Isham et al., 1994; Narayan, 1995; Isham & Kahkonen, 1999, 2002; Prokopy, 2005). A study on financially aided rural water supply projects has found that projects with a high degree of beneficiary participation had a success rate of 68%, while projects with low participation from beneficiaries achieved a success rate of only 12% (cited in Skidmore, 2000). Crow et al. (2012) observed that participation in CWSs provides time benefits, by reducing time spent on fetching water, and helps to increase the household income of the beneficiaries. But critics argue that participation can have adverse effects in terms of overburdening local people, and also that participation can turn out to be a mere presence if local people do not have the ability to influence the outcome of a project (Oakley, 1991; Cooke & Kothari, 2001, cited in Prokopy, 2005).

However, participation has been measured differently in the context of community water supply. Isham et al. (1994) and Narayan (1995) analyzed participation in a hierarchical order, with information sharing representing the lower end and decision making and control representing the higher end of the scale. Agarwal (2001) provided a detailed classification of participation in community-based management of natural resources. According to her, participation ranged from mere membership and attendance at BG meetings to active involvement in terms of influence in decision making and interactive participation, which has the potential to empower the beneficiaries. Özerol (2008) analyzed institutions of participation with different levels, i.e. zero order, first order and second order: the zero order engaged users in collective action for resource use and infrastructure maintenance; first order emphasized the participation of users in the processes for defining and enforcing zero-order institutions, i.e. to regulate and monitor; the highest level of participation (i.e. second order) involved users in organizing and hence engages them in the processes for revising first-order institutions.

Prokopy (2005) has argued that, in community-driven water supply projects, the contribution of money, labor, materials, etc., could be considered as a low form of participation. For him, households' attendance at meetings, speaking out at meetings, etc., contributed to the middle of the hierarchy, whilst participants' own initiatives and leadership roles contributed as the higher form of participation. Prokopy showed that decision making at the lowest possible level within a village is important for project success. In the same way, Marks & Davis (2012) argued that household members' participation in decision making with regard to the level of service provided is associated with a high level of sense of ownership and with the success of a project.

Sara & Katz (1998) took demand responsiveness to be the factor affecting project outcome instead of participation. They argued that, in demand responsive projects, communities were allowed to make informed choices about whether to participate in a project or not. Informed choice measured the degree to which individuals felt involved in decision-making processes and were informed about the consequences of the decisions. Rajasekhar & Veerashekharappa (2003) also considered beneficiaries' involvement in group meetings, decision making and implementation (in terms of payment of contributions and user fees) as indicators of participation in water supply projects.

2.1.5. Measuring Performance of Water Supply Schemes

Measuring performance of various water supply schemes requires a multidimensional approach that would not only capture quality of service delivery but also the factors that are critical for long term

sustainability of the schemes. Accordingly six indexes have been identified – three indexes to measure quality of service delivery and one index each to capture operational, financial, and institutional sustainability of water supply schemes. The service delivery indexes include Availability and Reliability index to capture quantity, quality, reliability, and adequacy of water supply; Household Satisfaction index capturing performance rating of water schemes by the household; and Cost of Service Index measuring affordability of service. The sustainability indexes include O&M index measuring the quality of O&M in terms of frequency and length of service disruptions; O&M Cost Recovery index capturing financial sustainability; and Institutional Sustainability index measuring the quality of the institutions (BGs) created for the day to day management of the community based schemes. In addition, an Overall Performance index has been calculated by aggregating the above six indices.

The selection of various indexes and their constituent indicators have been informed by the existing literature (Sara and Katz, 1997; Abrams et al., 1998; Carter et al., 1999; Sugden, 2001; Harvey and Reed, 2004; Mishra, 2008; Montgomery et al., 2009; Mazango and Munjeri, 2009, among others) as well as consultations with water practitioners. A description of the constituent indicators of the six indexes is presented below:

- Availability and Reliability Index:
- Household Satisfaction Index:
- Household Cost of Service Index:
- Operation and Maintenance Index:
- O&M Cost Recovery Index:
- Institutional Sustainability Index:

2.2. Empirical Literature Review

2.2.1. The One Water, Sanitation and Hygiene [WaSH] Program in Ethiopia

The One WaSH National Program (OWNP) is the Government of Ethiopia's (GoE) main instrument for achieving the goals set out for WaSH in the Growth and Transformation Plan (GTP 2). The program was designed to be implemented in two Phases. Phase I is covering the period from July 2013 to June 2015 and Phase II from July 2015 to June 2020. (OWNP, 2014)

Phase I of one WaSH, as is specified in the One WaSH national program, is designed to increase harmonization and alignment among and between development partners and the GoE. During this phase WaSH organizations and procedures are supposedly to be fully established and become operational at all levels. Plus during this Phase I, partners, including Civil Society Organizations (CSOs) are expected to increasingly align their targets, plans and activities with the program and strengthen coordination in planning, implementation, monitoring and reporting of all WaSH activities amongst stakeholders at different levels . Any new WaSH programs or new phases of existing WaSH programs are also expected to align with the Program's principles, approaches and plans. (OWNP, 2014)

OWNP Phase II will be either continuity or redesign. Continuity will consist completing the work that began in Phase I; that is a continuation of the institutional arrangements and implementation modalities of Phase I with some adjustments agreed during the comprehensive Midterm Review planned to take place at the end of 2015. (OWNP, 2014)

If redesign, Phase II would have different policy priorities, targets, institutional roles and responsibilities and/or implementation modalities. Consideration can also be given to broadening the Program's scope to include such related activities as watershed and water resources management, productive uses of water, environmental protection, climate resilience, etc. Any such redesigns would also have to be identified and agreed during the Midterm Review at the end of 2015. (OWNP, 2014)

The OWP has mainly 4 components: (OWNP, 2014)

Rural WaSH: Agrarian and Pastoralist (USD 1.03 Billion):

This component finances rehabilitation of existing and construction of new conventional community water points and water supply schemes, technical support of self-supply, supporting sanitation activities including improvement of household and institutional hygiene and sanitation. While implementing Pastoral WaSH requires alignment with other sectors and close coordination and collaboration with Ministry of Federal Affairs and NGOs and emergency WaSH activities that have special experience with development in Pastoralist areas.

Urban WaSH (USD 786 million for water supply and USD 95.7 million for sanitation improvements):

This component finances study and design; capacity building and management support; environmental and resettlement safeguards; immediate service improvements and expansion of water supplies. Sanitation and urban environmental improvements include procurement of desludging equipment; construction of facilities: latrine sludge/septage treatment plant and public toilets; and development of wastewater management systems in selected locations.

Institutional WaSH (USD 545.7 million):

Activities include support to improving water supply and sanitation facilities and hygiene practices at school and health institutions. Planning and Implementing WaSH activities at health institutions will be the responsibility of the Ministry of Health (MoH), Regional Health Bureaus, City/Town Administrations and Woreda health offices. While the Ministry of Education (MoE), regional education bureaus, city and Woreda education offices will be responsible for planning and implementing WaSH activities in schools, Water sector offices at regional, city or Woreda level may provide technical assistance in the design, construction and supervision of water supplies in institutions. Of the indicated amount, about 11, 415,542.00 USD is to be used for water quality monitoring. Doing so is expected to increase economy of scale and ease out administration arrangements.

Program Management and Capacity Building (90,028,152.00 USD for rural and 78,618,150.00 for urban USD and 10,158,848.00 USD for technical assistance in self- supply, supply chain, pastoral WaSH, M&E):

This component includes support to improve skills and capacity of the program's organizations and implementing parties at all levels to plan, manage and monitor program activities through training, post-construction management support, equipment and tools provision, and monitoring and reporting support. The Program will support minimum staffing and resource requirements necessary to effectively implement the Program at all levels. This is to be determined by a capacity assessment at federal, regional/city and town/Woreda level. Capacities of TVETCs and HSCs will be enhanced at an estimated cost of 11,977,590.00USD through support to training of trainers, curriculum development and training equipment for workshops and laboratories. Similarly, services from the Ethiopian Water Technology Institute (EWTI) will be used to train WaSH professionals at an estimated cost of 3,655,308.00 USD.

2.2.2. Challenges of the WASH Sector

As the previous sections have shown, providing WASH services brings many benefits. Unfortunately, however, the reality on the ground is that globally we are a long way from achieving these benefits for all people. Studies have shown that in many parts of the world, access to WASH services is still very low (Figures 1.1).

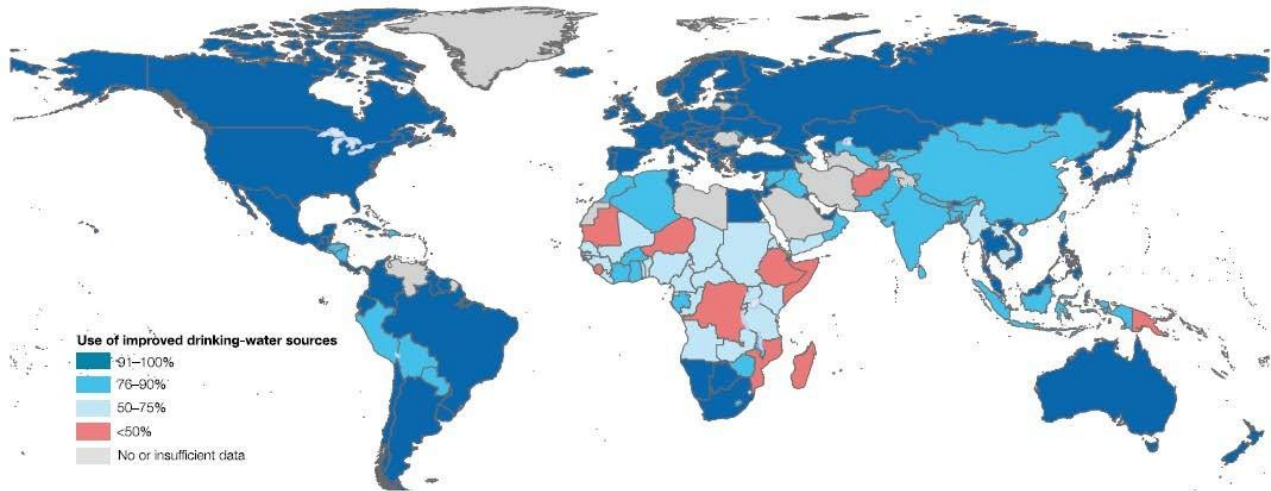


Figure 1.1: Percentage of population obtaining drinking water (data for 2008). (GLAAS, 2010)

Based on the 2008 data in Figures 1.1, what percentage got their drinking water from an improved source? Less than 50% of Ethiopians used an improved source for water. Note that the data in Figures 1.1 is from 2008 and this number is improving, but there is still a great challenge ahead.

The first challenge facing the WaSH sector in Ethiopia therefore is the scale of the problem. There needs to be a huge investment of time and money to design and build new infrastructure. The water supply system needs to be extended and be more reliable, with fewer breaks in service and less loss from leakage. Support services for the sector need to be improved to make it work effectively and sustainably. Monitoring needs to be increased so that breakdowns can be repaired in a timely manner. Regulations and enforcement should be stronger to protect the environment and human health. In addition there needs to be changes to the way projects are planned and implemented to overcome past difficulties. (OpenWASH, 2016)

There have been a number of other problems with past projects that have reduced their effectiveness. These problems include: (OpenWASH, 2016)

- Some projects have disregarded community participation. People were given a free service without community contributions in any form, e.g. labor, money. This meant the communities did not feel any sense of ownership of the service and failed to look after it. The experience of receiving free services has also created longer-term problems because communities can develop resistance to participatory approaches in future.
- Financial procedures were separate and different for each donor or aid organization, which was inefficient and time-consuming. Each donor had different processes, needs and expectations.
- WaSH is a cross-boundary sector that involves several different areas of responsibility within government at different levels but the need for collaboration between ministries, bureaus and offices has not been recognized in the past.
- In many cases, projects were implemented only in selected locations which did not bring benefits to everyone. In the past the focus was mainly in rural areas rather than towns, and serving agrarian rather than pastoralist populations.

2.3. Conceptual Framework

This study is planning to take the participation of beneficiary households as the proxy for collective action in the community management of water supply. Bearing in mind existing studies on participation, this paper is going to consider the following variables to measure participation:

Note that, the conceptual framework for this study has been developed on the basis of these variables.

Attendance at BG meetings:

Attendance at BG meetings will count the number of members appearing at the group meetings irrespective of the extent of participation. In the case of community-based schemes, the attendance at group meetings of at least one person from a household benefiting from a project will be made mandatory.

Making suggestions and influencing the decision:

If a member makes any suggestions or influences decisions relating to development interventions in a group meeting, it will be considered as a higher degree of participation.

Influencing the location of the water supply and the tariff:

It is possible that the beneficiaries (households) influence decisions regarding specific issues rather than the decisions in general. In the case of decisions relating to water supply, the location of the water supply and the monthly tariff will be given due attentions and will be considered important ones.

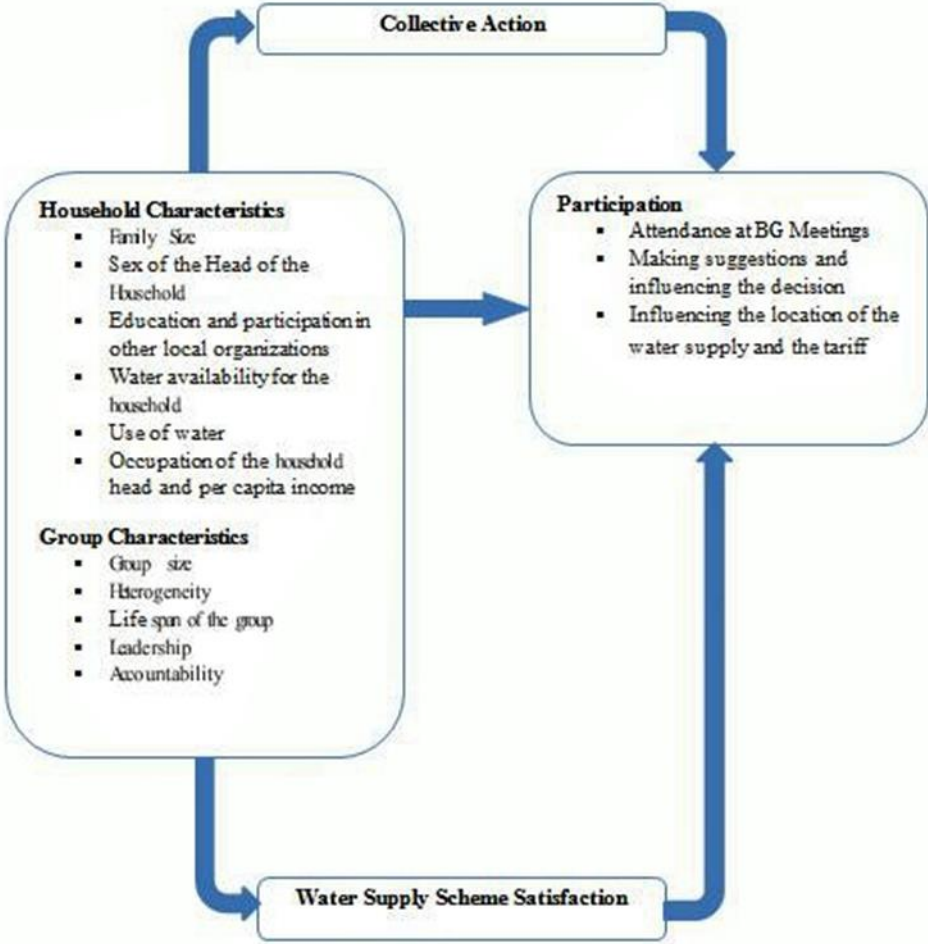


Figure 1.2: Conceptual framework adopted from K. R. Nisha (2013)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Research Design

The central concern of this study was to assess the factors that influence community participation in water supply schemes: the case of drought affected communities in Dollo Bay Woredas* of Afdher Zone, Somali Regional State. Hence, explanatory research design was implemented. In the analysis of the assessment of the impact of community participation in conflict-affected populations based water supply schemes through quantifying attendance in group meetings and community members' influence on decisions; and to identification of locality, group and household characteristics on the satisfaction of water supply schemes. Based on this, listing of households was used to prepare the sampling frame from which eligible respondents were determined.

In order to draw sound generalizations and enhance representativeness, 261 respondents of total households, were selected using systematic random sampling technique in an attempt to investigate respondents' attitude towards the impact community participation on the outcome of water supply schemes. The number of households selected from each of the sampled Sites was dependent on probability proportional to size. Once the sample size and sampling technique is determined, the next step that was carried out is arranging appropriate procedure for selecting the respondents.

3.2. Sampling Design

The Dollo Bay town has two main Kebeles [Kebele 1 and Kebele 2] and new IDP settlements which is under construction. The total population of the town is about 11,058 [3,000 Households] people. The Koraley Kebele has IDP settlement and the total population of the Kebele including IDP's is 5,581 [1515 Households] (3360 host and 2221 IDPs) people. As a result the survey has considered a total population that comprises 4515 households.

Note that, the sample size has been determined based on the sampling technique provided by Solvin's (2006) that is designed to determine the required sample size at 90% - 95% confidence level and with 5% - 10% level of margin of error. Hence, assuming the level of precision for the study to have a figure 6% and the sample size was obtained:

* The immediate upper bodies of administrative structure next to the Kebele.

$$n = \frac{N}{1 + N [e]^2} = \frac{4515}{1 + 4515 [0.06]^2} = 261$$

Where $n = 216$ is sample size,
 $N = 4515$ is the population size (Total HH) and
 $e = 6\%$ is the level of precision (margin of error).

Probability sampling method was preferably applied here so that it can provide each member of the community under study with equal non-zero probability for being to be selected in the sample (Lapin, 1982).

The sampling frame for this study was constructed on the basis of the mapping and frame work of Water Supply Need Assessment Survey, which was carried out by, Danish Refugee Council (DRC, 2018). The number of housing units, which belongs to the selected sample Sites, was taken and used as a sampling frame for selection of households.

Sites at Dollo Bay town and Koraley Kebele (Primary Sampling Units (PSU)) were chosen at the first stage of sample selection and the respondent (Elementary Sampling Units (ESU)) within a given household was selected at the second stage.

To use the Probability Proportional to Size (PPS) selection procedures, the number of individual associated with each Site must be known. The statistical report of DRC Water Supply Need Assessment on the entire sites in the periphery does provide the population distribution for each Site.

3.3. Sampling Procedure

The sampling Procedure, which was carried out during the data collection, is a two stage random sampling. That is, at the first-stage selection of the Sites was made and at the second-stage the selection of households was done.

Stage One:

Since the statistical report on the entire relocation Sites in the periphery does provide the population distribution for each Site, the size displaces in the sampled Site of the City Administration [S_{rj}] was obtained to be:

Table 3.1: The size of Respondents in the selected study Sites

Site, j	RS-1	RS-2
S_{ij}	3000	1515

Source: Field survey, Dollo-bay, 2019.

Selection of the sample Sites was carried out using purposive [non random] sampling technique. Taking into consideration the issue of Cost (in terms of money, time and effort) only 2 Sites, Dollo-bay town [RS-1], and Koraley Kebele [RS-2] were chosen.

Stage two:

The number of respondent, aged 20–50+ years, was assigned to each selected Sites proportionally following the next procedure.

P_{ij} = Percentage proportion of respondents aged 20 – 50+ years in Site j

$$= \frac{S_{ij}}{\text{Total size of households in the sampled Sites}} * 100$$

Then, the sample size of respondents aged 20 – 50+ years ($n = 261$) was distributed proportionally to each selected Site.

i. e., $P_{ij} * 261$ was the proportional sample size of Site j.

Table 3.2: Sample size distribution per selected Site

Sites, j	RS-1	RS-2
Sample Size Distribution	173	88

Source: Field survey, Addis Ababa, 2019.

The steps considered in the selection of respondents from each Site was carried out through a systematic random sampling with PPS.

Step 1: The sampling frame was contracted. It contains the total number of sampled population ($n = 261$), Number of targeted population per each sample Site and number of housing units and with the corresponding housing number in each sample.

Step 2: The sampling interval (SI) was determined by dividing the total sample size ($n = 261$) by the Sample Size Distribution of each Site.

- Step 3: Selection of starting point between 1 and SI using simple random sampling method was made.
- Step 4: The selected starting point has been taken as the first housing number/ unit and approached.
- Step 5: Every SIth house was chosen after the randomly selected house.

3.4. Source of Data

The main data source of the study was the community based primary survey on the factors that influence community participation in water supply schemes under wash project: the case of drought affected communities in Dollo Bay Woredas* of Afder Zone, Somali Regional State. For the purpose of this study, a retrospective survey was conducted on every community members of the age group 20 to 50+.

The DRC project is expected to directly reach 30,593 people in Fafan Zone and 16,738 People in Dollo Bay Woreda. The action has benefited 47,174 populations in the targeted Woredas of Fafan and Afder Zones, of which 51% are IDPs.

Dollo Bay town is one of the emergency WASH project target area. The town is located on the bank of Genale River at geographical coordinates of North 0430166 and East 04206330 and an average elevation of 177 meter Above Sea Level [ASL]. The town has two main Kebeles and new IDP settlements which is under construction. The total population of the town is about 11,058 [3,000 Households] people.

The Koraley Kebele♥ is one of the emergency WASH project target area and it is located in Dollo Bay Woreda of Afder Zone of Ethiopian Somali Regional State. The Kebele is located south east of Dollo Bay town at about 10 km and situated along the bank of Genale River at geographical coordinates of North 0176465 and East 0463964 and average elevation of 173 meter ASL. The Kebele has IDP settlement and the total population of the Kebele including IDP's is 5,581 [1515 Households] (3360 host and 2221 IDPs) people.

* The immediate upper bodies of administrative structure next to the Kebele.

♥ The smallest administrative units in Urban Ethiopia.

Dollo Bay Woreda is considered as a study area due to the greater chance of obtaining a target population with diversified social and economic characteristics and the researcher's well familiarity with the area. Its validity has been proved in this research.

3.5. Data Collection Tools

The major instrument that was used for the collection of the required data within the study is a questionnaire. So as to minimize potential complexities and data defects, many of the items was pre coded with a great deal of caution. The questionnaire was initially prepared in English and given to at least three professionals and principal advisor for comments. Necessary corrections were made and the final English version is prepared which was annexed to the final report. Since major circulating language is Somali, the questionnaire was translated into Somali so as to avoid certain inconsistencies and communication barriers.

3.6. Procedure of Data Collection

3.6.1. Development of the Instrument

A questionnaire was administered in the survey. The questionnaire, which was designed for generating the required information, has incorporated more than 60 items and categorised in the following manner:

- Socio-demographic information
- Economic information
- Opinion on water supply scheme

Moreover, there was two qualitative methodologies for identification and analysis in this study, they are field research and structured in-depth interview. Field research is a prototype of qualitative research and can be used to gather qualitative data because it takes holistic perspective and analysis of real-life processes (Nachmias and Nachmias 1992). In the field research, contexts were mapped for the understanding of subject interpretations and finally produce an explanation that reflects the social realm. Field research is mainly used to uncover the process of social life (Gaber 1993), while structured in-depth interviews can provide more detailed information involving systematic and intensive observation of sightings or social processes based on a list of questions that have been compiled in this study (Boyce and Neale 2006).

3.6.2. Pilot Survey

The Somali version of the questionnaire was pre-tested on 10 households in Koraley Kebele. The selection of the sample, which was carried out for the pre-test, is purposive. After the pre-test:

“the student researcher has gone through on each and every field experience and decided to make some rephrasing on some of the questions. Based on the time that takes to fill the whole questionnaire during the pilot survey, the data collection schedule was set.”

3.6.3. Field Work

The fieldwork was began on the 18th of May and carried out for 7 consecutive days. In interviewing the respondents, the researcher was moved to the selected house (ESU) according the sampling frame and observed eligible respondents before selecting any for an interview. During the interview the data collectors familiarize themselves with the respondents so as to minimize hesitancy and discomfort. By and large, collecting information from 250 households was successfully completed in the fieldwork. Unfortunately, 11 respondents were refused to seat for an interview and they were not replaced.

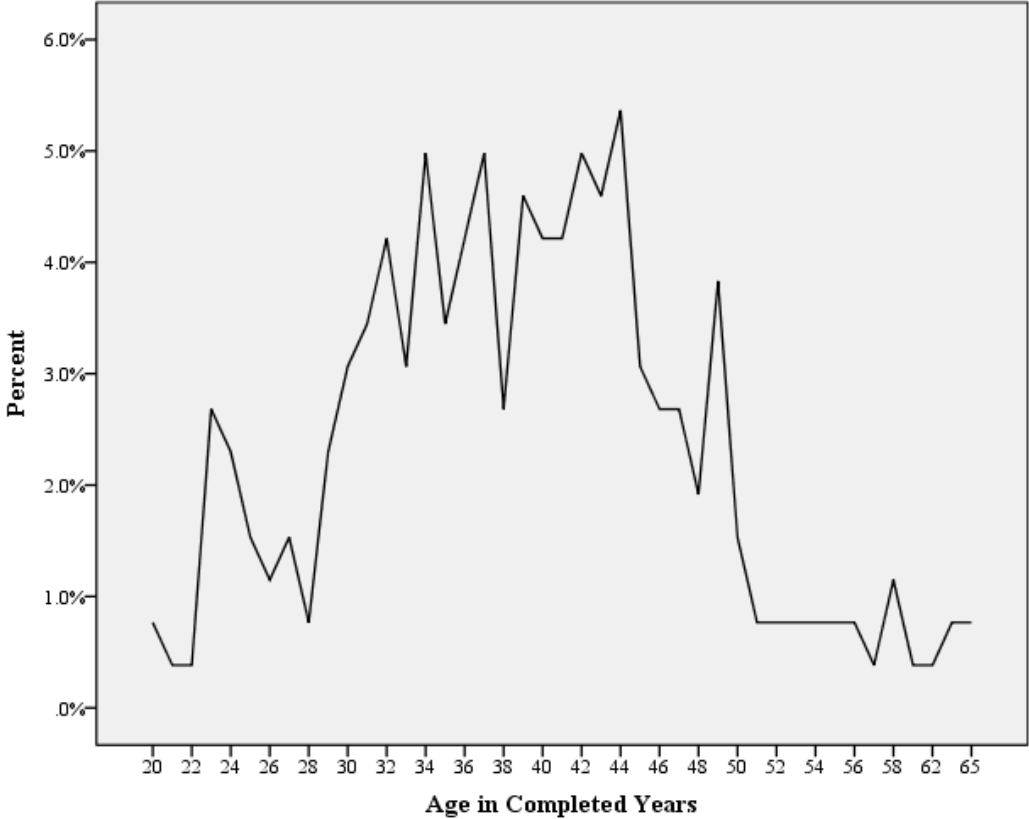
3.6.4. Data Quality

To assess the extent of miss-reported age an attempt was made using the method of assessing quality of data by graphic analysis. Following this method, the single age distribution of the respondents was graphically shown in Figure 3.2.

The mean age of the sample observation is 38.97 years with standard error 0.577. The most frequent ages considered in the sample are 44 years and the median age is 39 years. The measure of dispersions variance and standard deviation are also obtained as 9.005 and 81.087 respectively. These measures are the most useful measures of dispersion, which take into consideration each value of the data and also as to how all the observations are distributed.

Since errors in the reporting of age needs to refine it has been given detailed examination. Errors in the tabulated data may arise either from failure to record age or miss reporting of age (Shryock and Siegel, 1971).

Figure 3.2: Graphical presentation of single year age distribution of respondents aged 20 – 50+.



Source: Field survey, Dollo-bay, 2019.

Even though a number of general indices of digit preference have been proposed, in evaluating quality of data regarding age digit preferences Myers' blended index is applied. This index, similar to the others, will identify if there is age heaping within the collected data. The method yields an index of preference for each terminal digit, representing the deviation, from 10.0 percent of the proportion of the total population reporting on the given digit. A summary index, which is an estimate of the minimum proportion of persons in the population for whom an age with an incorrect final digit is reported, is derived as one half the sum of the deviation from 10.0 percent each taken without regard to sign. If age heaping is non-existent, the index would approximate zero (Shryock and Siegel, 1971). In general very small deviation from 10.0 percent will imply that the heaping of age is not existent and should be disregarded.

According to Shryock and Siegel, 1971, the abbreviated procedure to calculation calls for next steps:

Step one: Sum of the populations ending in each digit over the whole range, starting with

lower limit of the range (Example, 10, 20, 30, - - -, 80; 11, 21, 31, - - -, 81).

Step two: Ascertain the sum excluding the first population combined in step one (Example, 20, 30, 40, - - -,80; 21, 31, 41, - - -,81).

Step three: Weight the sum in step one and two and add results to be obtained a blended population (Example, weights 1 and 9 for the ten digit; weights 2 and 8 for the one digit).

Step four: Convert the distribution in step three in to percent.

Step five: Take the deviation of each percent in step four from 10.0, the expected value for each percent.

The results in step five indicate the extent of concentration or avoidance of a particular digit. The weights in step three represent the number of times the combination of ages in step one or two is included when the starting age is varied from 10 to 19.

Table 3.3: Calculated preference indexes for terminal digits by Myers' Blended Method

Terminal Digit	Population with Terminal Digit 'a'		Weights for		Blended Population		Deviations of % from 10.0 (6)-10.0 (7)
	Starting at age 20 + a (1)	Starting at age 30 + a (2)	Column 1 (3)	Column 2 (4)	Number (1)*(3)+(2)*(4) (5)	Percent distribution (6)	
0	26	24	1	9	242	9.80	0.20
1	23	22	2	8	222	8.99	1.01
2	28	27	3	7	273	11.05	1.05
3	29	22	4	6	248	10.04	0.04
4	37	31	5	5	340	13.77	3.77
5	25	21	6	4	234	9.47	0.53
6	23	20	7	3	221	8.95	1.05
7	25	21	8	2	242	9.80	0.20
8	17	15	9	1	168	6.80	3.20
9	28	22	10	0	280	11.34	1.34
	Total				2470	100.00	12.39
	Summary Index				-	-	6.19

Source: Field survey, Doll-bay, 2019.

In this particular study, the summary index is obtained to be 6.19. By this index, age with incorrect final digit was reported by one tenth of the study population. However, since age is used in-groups the observed digit preference would not constitute a serious limitation in the analysis.

3.7. Data Processing and Analysis

3.7.1. Data Entry and Cleaning

The questionnaires were made ready for data entry after data collection and data was entered into the computer using the SPSS software. The data entry was completed in a total of two consecutive days. Data cleaning and editing was done case by case and variable wise.

3.7.2. Data Analysis

For the purpose of this study, where the objective is to explore the relationship of a binary discrete variable to one or more independent variable, the application of appropriate statistical technique will be needed. To test the relative importance of the factors affected community participation in water supply schemes, the following model was used.

$$P = f(G, H, S)$$

where:

P is the participation index;

G represents the group characteristics;

H represents the socio-economic characteristic of the household; and

S represents Satisfaction on the water supply schemes.

To assess the effect of each set of factors on participation, linear regression models were estimated using an ordinary least square method, with a participation index for attendance and decision making as a dependent variable.

To analyze the data bi-variate and multi-variate analytical methods will be used. The data will be analyzed using SPSS statistical package (Norusis, 1990).

A bi-variate test (Chi-square) was used to examine the association of each independent variable with the dependent variables. Only those having significant association (Pearson Chi-square P Value of \leq

0.05) with the dependent variable were selected for multivariate analysis. Multivariate analysis (logistic regression) will be used to examine the relative effect of each independent variable (predictor) on the dependent variables.

The logistic regression model will be selected to analyze the data only for it requires far fewer assumptions than alternative methods of analysis of cross - tabulated data; and even when the assumptions required for such analyses are satisfied, logistic regression still perform well (Norusis, 1990).

Thus, the logistic regression model has been applied to predict the binary dependent variable (Hosmer and Lemshow, 1989: 1). Therefore, one logistic model was fitted for respondents' approval.

The logistic regression model predicts the natural logarithm of the odds of the dependent variable by a linear function of the independent variable. The logistic regression model is given by:

Mode 1:

$$p_{index\ 1} = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik} + U_k$$

$$p_{index\ 1} = \beta_0 + \beta_1 leadership + \beta_2 famsize + \beta_3 sex_head + \beta_4 sex_participant + \beta_5 Education + \beta_6 lo_participation + \beta_7 use_drinking + \beta_8 water + \beta_9 income + \beta_{10} satisfaction + U_k$$

Mode 2:

$$p_{index\ 2} = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik} + U_k$$

$$p_{index\ 2} = \beta_0 + \beta_1 famsize + \beta_2 sex_participant + \beta_3 education + \beta_4 lo_participation + \beta_5 use_drinking + \beta_6 water + \beta_7 income + U_k$$

The *odds Ratio* is given by $\frac{P}{1-p}$.

Where, $1 - p$ is the conditional probability that water supply scheme output is influenced by community participation.

3.7.3. Variables and Their Specification

The unit of analysis was a household head in the age 20 years and above. Table 3.4 provides the description of independent variables. The independent variables [often called covariates] incorporated in the study were classified as socio-demographic and economic factors.

Table 3.4: Description of Independent Variables

Variable Label	Variable Name	Description
Groupsize	Group size	
Leadership	Active leadership in the group	1 = Active leadership
Famsize	Size of the family	
Sex_head	Sex of the household head	1 = Male
Sex_participant	Sex of the participant in group meeting	1 = Male
Education	% of family members with education greater than 10th standard	
Lo_Participation	% of family members participating in local organizations	
Use_drinking	Water used for drinking purpose	1 = Use water for drinking to a large extent
Water	Scarcity of water	1 = Perennial scarcity of water
Occupation	Occupation of head of the household	1 = Casual labor
Income	Monthly household income	
Satisfaction	Overall satisfaction with the water supply schemes	1 = Satisfied

*In the case of qualitative variables, the frequencies of the variable with value 1 have been given in percentages. For example, sex of the household head is 1 for male and 0 otherwise. The table explains that 86.5% of the sample households are headed by male.

3.8. Ethical Issue

This study has preserved the ethical integrity for ethics is one of the critical issues in research. Similarly, giving emphasis to the importance of ethics in conducting research, Mack et al. (2005) argued that data collection activities require more than casual interaction with a person and require his/her individual informed consent). Hence, prior consent was obtained from affected villagers before

collecting information from them. The prior consent has been acquired after presenting the utility of the present study. Anonymity of participant's identity was maintained in the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Introduction

The questionnaire was administered at the household level. The head/spouse of the head of the household or a “knowledgeable” member of the family was asked to be the respondent for each administered questionnaire. All the sampled households were considered in the analysis.

Any information obtained from the survey results has been explored more deeply by interviewing methods with community representatives. The survey in this study was conducted on 250 households considering the characteristics of the head of the family (the main breadwinner in the family, both male and female). Respondents were selected randomly. The survey was conducted from 18 May 2019 to 25 May 2019 on drought affected communities in Dollo Bay town and Koraley Kebele, which is one of the emergency WASH project target area located in Dollo Bay Woreda of Afder Zone

The spread of the number of respondents each of the selected study areas presented in Table 4.1.

Table 4.1: Number of respondents used in the analysis

S. N ^o .	Selected Relocation Sites	Number of Respondents
1	Dollo Bay Town	170
2	Koraley Kebele	80
Total		250

Source: Field survey, Doll-bay, 2019.

As it is revealed in Table 4.1, the data comprises of a total of 250 households. This includes 170 households from Dollo-bay town, and 80 households from Koraley Kebele. The questionnaire entails questions on 3 broad categories:

1. Socio-demographic Information of Respondents,
2. Economic Information of Respondents, and
3. Opinion on Community Participation in Water Supply Schemes.

4.2. Background Characteristics of the Households

Table 4.1 presents the draught affected and IDP community members among 250 sampled household heads [respondents] by selected background characteristics. Table 4.1 reveals that attendance in the beneficiary meeting is regular by almost all of the respondents in all the selected Kebeles; out of ten respondents 8 of them or 75.2 percent of all contacted respondents residing in the selected Kebeles have been confirmed that they attend regularly or occasionally.

Comparing the attendance in beneficiary group meeting among the younger and older respondents who belong to the age group 20 to 24 years and 34+ years respectively is observed to be lesser than the percentage attendance in beneficiary group meeting in the age group 25 - 34 years (Table 4.1).

Table 4.1, revealed that the percentage of attendance in beneficiary group meeting among women respondents is vividly lesser than the percentage of attendance in beneficiary group meeting among male respondents.

Educated respondents [households] are slightly less likely than uneducated households to have attended in beneficiary group meeting. The pattern of variation with Education is evident in the observed outcomes; the percentage of attendance in beneficiary group meeting among respondents in primary and junior category show more percentage than respondents in secondary and above category.

Overall, the displacement-induced impoverishment is lower among women who belong to not married than who belong to ever married. As it is discovered in Table 4.1, the percentage of not married households is lower by approximately 65 percent than ever married respondents.

With regard to family size of the household, the study revealed that a household with medium family size is more likely to attendance in beneficiary group meeting than a household with a lesser and more family size. It was observed that majority of the respondents 57.9% claimed that they attend in beneficiary group meeting either regularly or occasionally. [Table 4.1].

Answering to the question raised on the source of the respondent's livelihood the study revealed that majority 49.7% made known that the source of their income goes to pastoralist [Table 4.1].

Table 4.2: Households according to selected background characteristics

Characteristics of the respondents		Attendance at the beneficiary group meetings							
		Regularly		Occasionally		Never attend		Total	
		Nº.	%	Nº.	%	Nº.	%	Nº.	%
Kebele	Kebele 1	36	14.4	30	12.0	17	6.8	83	33.2
	Kebele 2	32	12.8	30	12.0	25	10.0	87	34.8
	Koraley	38	15.2	22	8.8	20	8.0	80	32.0
Total		106	42.4	82	32.8	62	24.8	250	100.0
Sex of the household head	Male	91	36.4	70	28.0	55	22.0	216	86.4
	Female	15	6.0	12	4.8	7	2.8	34	13.6
Total		106	42.4	82	32.8	62	24.8	250	100.0
Age of the respondents	20 - 24 years	17	6.8	0	0.0	3	1.2	20	8.0
	25 - 29 years	58	23.2	0	0.0	0	0.0	58	23.2
	30 - 34 years	28	11.2	34	13.6	1	.4	63	25.2
	34+ years	3	1.2	48	19.2	58	23.2	109	43.6
Total		106	42.4	82	32.8	62	24.8	250	100.0
Educational level of the respondents	1 - 5 grade	62	24.8	27	10.8	24	9.6	113	45.2
	6 - 9 grade	12	4.8	53	21.2	38	15.2	103	41.2
	Technical/vocational cert	19	7.6	0	0.0	0	0.0	19	7.6
	University/college diploma	12	4.8	0	0.0	0	0.0	12	4.8
	University/college degree	1	.4	2	.8	0	0.0	3	1.2
Total		106	42.4	82	32.8	62	24.8	250	100.0
Marital status	Married	63	25.2	72	28.8	50	20.0	185	74.0
	Single	43	17.2	0	0.0	3	1.2	46	18.4
	Widowed	0	0.0	10	4.0	9	3.6	19	7.6
Total		106	42.4	82	32.8	62	24.8	250	100.0
Number of children in a household	1 - 4	10	4.9	9	4.4	33	16.2	52	25.5
	5 - 9	53	26.0	65	31.9	26	12.7	144	70.6
	10+	0	0.0	8	3.9	0	0.0	8	3.9
Total		63	30.9	82	40.2	59	28.9	204	100.0
Source of livelihood/income	Professional-technician	31	12.4	0	0.0	0	0.0	31	12.4
	Administrator, manager	1	.4	2	.8	0	0.0	3	1.2
	Sales worker	29	11.6	6	2.4	14	5.6	49	19.6
	Casual laborer	24	9.6	15	6.0	5	2.0	44	17.6
	Pastoralist	21	8.4	59	23.6	43	17.2	123	49.2
Total		106	42.4	82	32.8	62	24.8	250	100.0

Source: Field survey, Doll-bay, 2019.

4.3. Participation in Water Supply Schemes in Doll-bay Woreda

This study has taken the participation of beneficiary households as the proxy for collective action in the community management of water supply. Bearing in mind existing studies on participation, this paper has considered the following variables to measure participation:

4.3.1. Attendance at BG Meetings

Attendance at BG meetings counts the number of members appearing at the group meetings irrespective of the extent of participation. In the case of community-based schemes, the attendance at group meetings of at least one person from a household benefiting from a project has been made mandatory. The data reveal that meetings are attended mostly by women, whilst the men were away pursuing livelihood activities. The survey results (presented in Table 4.3) reveal that a majority of households (42.6%) attended the meetings regularly; however, nearly 25% of beneficiary households never attended the meetings.

Table 4.3: Distribution of households [%] by attendance at BG meetings

Attendance	Percentage of households
Regularly	42.6
Occasionally	32.6
Never attend	24.8
Total	100.0 [250]

Note: [Actual number in brackets]

Source: Field survey, Doll-bay, 2019.

4.3.2. Making Suggestions and Influencing the Decision

If a member makes any suggestions or influences decisions relating to development interventions in a group meeting, it can be considered as a higher degree of participation. Sample respondents were asked ‘whether they made any suggestion, in general, relating to the scheme or relating to the drinking water’ and ‘what was the extent to which they influenced the decision’. Table 4.4 reveals that a majority of those attending the meetings did not offer any suggestions in the group meetings. Only 11.3% of the sample respondents reported that they always made suggestions in the group meetings; the percentage of households influencing decisions was even less.

Table 4.4: Distribution of households [%] by extent of participation

Attendance	Making Suggestion	Influencing Decision
Always	11.3	10.3
Occasionally	26.5	25.2
Never	62.3	64.5
Total	100.0 [250]	100.0 [250]

Note: [Actual number in brackets]

Source: Field survey, Doll-bay, 2019.

4.3.3. Influencing the Location of the water supply and the tariff

It is possible that the beneficiaries (households) influence decisions regarding specific issues rather than the decisions in general. In the case of decisions relating to water supply, the location of the water supply and the monthly tariff are important ones. Respondents were, therefore, specifically asked, first, whether their household influenced decisions relating to location of the water supply (WS) and, second, whether they influenced the fixing of water tariff rates charged to users. It was found that the percentage of respondents influencing decisions relating to the fixing of the water tariff was higher than that relating to the decision regarding the location of water supply (Table 4.5). However, the actual number of households influencing the decisions was not significant.

Table 4.5: Distribution of households [%] influencing decision

Influence in Decision	Making Suggestion	Influencing Decision
Large influence	5.2	4.2
Medium	8.4	14.2
Little bit	7.7	11.9
Not at all	78.7	69.7
Total	100.0 [250]	100.0 [250]

Note: [Actual number in brackets]

Source: Field survey, Doll-bay, 2019.

4.4. Participation Index

Two separate participation indices were prepared for the purpose of analyzing the variations in participation across the institutional options and the factors contributing to these variations. The indices combined two or more qualitative variables, to give a better picture of the involvement of beneficiaries

in the community-based water supply schemes. To construct the indices, weights were assigned to different levels of participation. The weighted sum of different participation levels was taken as the participation index. The resultant participation index ranged from 0 to 100, with 100 representing the higher level of participation and 0 representing no participation.

Participation is measured using three variables: (i) attendance at the group meeting; (ii) making suggestions and influencing decisions in general; and (iii) influencing specific decisions on tariff and location. The first index is prepared based on the first variable and first part (making suggestions) of the second variable. The second index is prepared based on the third variable alone.

4.4.1. Index for Attendance at Meetings

The first index on participation considered mere attendance at the group meetings as well as the extent of making general suggestions. This index was prepared by giving a 25% weight to attendance at meetings and a 75% weight to making suggestions. This participation index thus represented the passive form of participation as the variables related to influencing decisions were not included in this index. The distribution of households by index attendance at the meetings shows that a majority of the households covered by the community scheme were participating in the BG meetings (Table 4.6). Participation for the majority of households varied between low and moderate, implying that a smaller number of households were involved in making suggestions regularly. Distribution of households by attendance index shows that only 36.5% of households participated well in community managed water supply schemes.

Weights were calculated using the 'DEFINITE' package, by giving first preference ranking to making suggestion in the meeting and second to mere attendance, following the typology of Agarwal (2001). Agarwal argues that the consultative form of participation (being asked an opinion on specific matters without guarantee of influencing the decision) is a higher level of participation compared to passive participation (attending the meeting and listening to decisions taken without speaking up).

Table 4.6: Distribution of households [%] by index for attendance at the meeting [CWS, DWA, DRC]

Institutions	Index					Total
	No participation	Low participation	Moderate participation	High participation	Active participation	
	[0]	[0 - 25]	[25 - 50]	[50 - 75]	[>75]	
CWS	6.5	45.5	11.5	20.5	16.0	100[161]
DWA	86.5	6.7	3.3	1.7	1.7	100[49]
DRC	24.0	42.0	6.0	24.0	4.0	100[40]
Total	24.8[62]	37.4[94]	9.0[23]	17.4[43]	11.3[28]	100.0 [250]

Note: [Actual number in brackets]

Source: Field survey, Doll-bay, 2019.

In the case of DWA schemes, there were no formal water user associations. But, DWA in the locality provided an opportunity for users to present their interests and demands to the authorities concerned. However, only 13% of the households benefiting from DWA schemes either attended or made any suggestion regarding water supply in the DWA meetings. A detailed analysis of these households shows that they were all using public stand posts provided by DWA. None of the households having private household connection attended any of the DWA meetings. In the case of DRC provided water supply schemes, water user associations existed in an informal manner: 76% of the beneficiary households marginally or actively participated in these informal meetings. Among the households participating in group meetings, 42% had low participation indicating that they were merely attending the meetings without making any suggestions.

4.4.2. Index for Decision Making

The second index for participation considered only households' participation in terms of their influence on decision making in the location of water supply and monthly tariff. The index was constructed by giving a 25% weight to influence on the location and a 75% to influence on the fixing of the monthly tariff for the water supply. The decision-making index represents households' participation in decision making and could be considered as an active form of participation. The results show that more than 50% of households were not involved in the decision-making process (Table 4.7). Only 6.5% of the households participated actively in decision making with an index value greater than 75.

Low household participation in decision making in community schemes was mainly the result of the extended support of NGOs in the implementation process. Information from the field shows that, in a majority of cases, NGOs played a major role in the selection of technology for water supply and location of source. In some cases, initially, the monthly tariff was also suggested by NGOs. But, later, the BGs and committees revised the tariff according to cost of O&M.

In the case of DWA, the beneficiaries did not have any influence on the location decision for the water supply and monthly tariff. DWA decisions were mainly taken by the government at the regional level. In the DRC schemes too, the participation of households in taking decisions regarding location of water supply and tariff was very scanty. This was mainly because the implementation of Dollo-bay water supply schemes was usually made either through user committees or through the mayor’s respective line department.

Decisions on the location of the water supply were mainly of a technical nature, whereas decisions on the monthly tariff reflected the households’ willingness and capacity to pay for water. In the case of community managed schemes, engineers of supporting organizations mainly helped the beneficiaries with regard to the location of the water supply, and the decision on water supply location was taken once in the entire lifespan of the group. However, the decision on monthly tariff needed frequent revision with the changes in the cost of operation and maintenance [O&M], even though the NGOs influenced the decision in the initial stages. For this reason, the variable influence on location of water supply was assigned less weight.

Table 4.7: Distribution of households [%] by index for decision making [CWS, DWA, DRC]

Institutions	Index					Total
	No participation	Low participation	Moderate participation	High participation	Active participation	
	[0]	[0 - 25]	[25 - 50]	[50 - 75]	[>75]	
CWS	52.5	13.5	13.0	14.5	6.5	100[161]
DWA	100.0	0.5	0.0	0.0	0.0	100[49]
DRC	86.0	8.0	2.0	4.0	0.0	100[40]
Total	67.1[168]	10.0[25]	8.7[22]	10.0[25]	4.2 [10]	100.0 [250]

Note: [Actual number in brackets]

Source: Field survey, Doll-bay, 2019.

The study has further analyzed the relative importance of other factors which affect collective action in water supply schemes. A detailed explanation of the factors has been given in the following sections.

4.5. Factors Affecting Collective Action

Factors affecting collective action vary with the nature of the resources and the conditions under which collective action were carried out (Ostrom, 1990; Oarkerson, 1992; Baland & Platteau, 1996). Wade (1988) mentioned that organizational success depends on factors such as: (i) boundaries of common pool resources; (ii) technology; (iii) the relationship between resources and user groups; (iv) characteristics of user groups; (v) noticeability, i.e. ease with which rule breaking free riders are detected; and (vi) relationship between users and the state.

According to Uphoff (1999), four basic ubiquitous activities of organizations (decision making, resource mobilization and management, communication, and conflict resolution) are essential for mutually beneficial collective action (MBCA). MBCA reduces transaction costs and increases the probability that individual efforts become effective. Without the above four activities, collective action becomes more difficult and less likely. Oarkerson (1992) identifies four sets of factors influencing collective action: (i) physical attributes; (ii) institutional arrangement; (iii) mutual choice strategies and consequent pattern of interaction; and (iv) outcome and consequences.

Consistent with Oarkerson's (1992) framework, the present study has identified a number of characteristics of the group and the socio-economic background of the beneficiary households as factors affecting collective action in water supply schemes. The characteristics are listed below.

4.5.1. Group Characteristics

Group size

It considers the number of members in the community group. Theoretically it is argued that a larger size of group adversely affects the collective action in it (Olson, 1965; Ostrom, 1990). Hence, the relationship between group size and participation is expected to be negative.

Leadership

It is argued that the problems which arise in a group due to large size and heterogeneity can be solved with the help of effective leadership (Vedeld, 2000). The present study has classified a group as having

active leadership if one or two people in the BG took the sole initiative to solve conflicts and problems arising in the group. It is assumed that active leadership in a group advances the participation of other beneficiaries in the group.

4.5.2. Household Characteristics

Family size

As the size of a family increases, the quantity of water needed also increases. Such a need influences households to participate in the group meetings and decision making. A large family size increases the possibility that at least one member of the household could attend group meetings regularly. Hence, the relation between household size and participation is assumed to be positive.

Sex of the head of the household and participant

Female members of a household usually bear more hardship in fetching water and it is therefore assumed that female participants will take greater participation in the meetings, either in terms of making suggestions or influencing decisions of water supply, compared to men. However, a female-headed household has an added burden of earning income in addition to the responsibility of managing the house. Thus, a female head of a household participates less in community group meetings compared to male heads.

Education and participation in other local organizations

It is assumed that better education improves awareness of public activities and hence tends to enhance participation. The education variable was measured as the percentage of household members with an education higher than 10th Grade. Similarly, the characteristic of participation in local organizations measures people's involvement in other organizations such as women's self-help groups, Dollo-bay cultural and political organizations, and represents the strength of social capital in the locality. The study has measured the percentage of household members involved in at least one local organization and assumed it to be positively related to participation in CWS schemes.

Water availability for the household

Beneficiaries' participation in group meetings may be influenced by the difficulties that they face in fetching water. A household which does not own a well and faces problems collecting water throughout the year is assumed to participate actively in group meetings.

Use of water

The purposes for which a particular household use the water supplied through the different schemes influences participation. If a household uses the water to a large extent for drinking purposes, there is a possibility of higher participation.

Occupation of the household head and income

The occupation of the head of the household indicates household security in earning income. For casual workers such as agricultural laborers, employment was not assured throughout the year. As casual workers and daily wage earners, their participation in meetings was more costly compared to those having regular employment. The present study has considered a dummy variable to capture the effects of occupation on participation. Higher household income raises the standard of living of a household. Also, with higher income, it is assumed that the opportunity cost of participating in the group meeting reduces. Hence, household income is expected to have a positive influence on participation.

4.5.3. Water Supply Scheme Satisfaction

Overall satisfaction in water supply system

Overall satisfaction has been accounted for in households' perceptions of the water supply scheme, whilst frequency of breakdown captured the effectiveness of the water supply systems. These variables could be taken as a proxy for the outcome of collective action. It has been argued that, over time, poor outcomes influence collective action adversely (Oarkerson, 1992; Narayan, 1995). Hence, it is assumed that frequent problems with the water supply reduce people's incentive to be involved in community schemes. Studies on community-driven water supply projects have mainly analyzed the relationship between participation and project outcomes in terms of effectiveness and sustainability. Most of these studies concluded that participation improves project outcome (Narayan, 1995; Sara & Katz, 1998; Isham & Kahkonen, 1999, 2002; Prokopy, 2005).

All the group and household characteristics were taken as independent variables. A description of independent variables used in the model can also be seen in Table 4.8.

Table 4.8: Group and household characteristics as factors affecting collective action in WSS

Variable Label	Variable Name	Description	Frequency [or Mean]*	Expected Sign
Groupsize	Group size		48	-
Leadership	Active leadership in the group	1 = Active leadership	38.1	+
Famsize	Size of the family		7	+
Sex_head	Sex of the household head	1 = Male	86.5	+
Sex_participant	Sex of the participant in group meeting	1 = Male	34.5	-
Education	% of family members with education greater than 10th Grade		13.71	+
Lo_Prticipation	% of family members participating in local organizations		12.86	+
Use_drinking	Water used for drinking purpose	1 = Use water for drinking to a large extent	42.3	+
Water	Scarcity of water	1 = Perennial scarcity of water	41.9	+
Occupation	Occupation of head of the household	1 = Casual labor	17.6	+
Income	Monthly household income		Birr 2,760.20	+
Satisfaction	Overall satisfaction with the water supply schemes	1 = Satisfied	73.2	+

In the first model, the participation index for attendance was taken as the dependent variable. The index shows the extent to which households participated in the group meetings and made suggestions relating to the management of water supply system. The value of the index varies from 0 to 100, with 100 representing 100% participation, or active participation in the BG meeting. To analyze the factors affecting the participation index relating to attendance, only respondents participating in the Community-managed Water Supply Schemes and DRC schemes were taken into consideration because participation of the households covered by Dollo-bay schemes in group meetings was negligible – only 13.4% of the families participated in the group meetings and half of the participants had a very low participation rate.

In the second model, the index of participation in decision making was taken as the dependent variable and it varies from 0 to 100. The higher the value of the index indicated more active participation in decision making. This model was applied to respondents only from CWS schemes, as the participation

index in decision making was low or nil in the case of households which benefited from DRC and DWA schemes.

Initially, both the models were estimated with all the independent variables mentioned above. In the later stage, insignificant variables were omitted from the model by undertaking a stepwise regression analysis. Variables were omitted by considering the following criteria: (1) multicollinearity among the variables; (2) significance of chi-square statistics in cross tabulation of particular variable with dependent variable; (3) contribution of particular variable to the explanatory power of the model (variable is omitted if adjusted R-square increased after omission of that variable from the model). Estimates of the models have been shown in Tables 4.9 and 4.10.

Table 4.9: Factors affecting participation in attendance in the group meetings

[Dependent variable: Participation index of attendance]

Variable	Coefficient	Std. Error	t-statistics
C	0.70	9.79	0.07
Leadership	5.17	3.89	1.33
Famsize	3.00*	0.64	4.69
Sex_head	8.08***	4.84	1.67
Sex_participant	11.18**	4.42	2.53
Education	0.30*	0.09	3.33
Lo_participation	0.51*	0.12	4.41
Use_drinking	10.40*	3.66	2.84
Water	19.25*	6.52	2.95
Income	0.00042**	8.00	2.03
Satisfaction	4.87	3.88	1.26
R-squared	0.29	F-statistic	8.67**
Adjusted R-squared	0.25	Log likelihood	1,175.39
No. observations	202	Durbin–Watson stat	1.91

Note:

#White heteroskedasticity-consistent standard errors and covariance.

*, **, *** Significant at 1%, 5%, 10% level respectively.

Table 4.10: Factors affecting participation in decision making [Dependent variable: Participation index of decision making]

Variable	Coefficient	Std error	t-statistic
C	-15.27	13.95	1.09
Famsize	2.31*	0.76	3.05
Sex_head	7.82	5.91	1.32
Sex_participant	10.73**	4.51	2.38
Education	0.34*	0.12	2.99
Lo_participation	0.51*	0.15	3.29
Use_drinking	13.76*	4.98	2.76
Water	17.83**	7.73	2.31
Income	0.00049***	0.00	1.89
R-squared	0.26	F-statistic	6.11*
Adjusted R-squared	0.22	Log likelihood	941.548
Durbin-Watson stat	1.80		
White Heteroskedasticity Test			
F-statistic	1.227524		0.158249
Observed R-squared	78.90032		0.194433
Number of observations	161		

Note: *, **, *** Significant at 1%, 5%, 10% level respectively.

Results

Mode 1:

$$pindex\ 1 = \beta_0 + \beta_1 leadership + \beta_2 famsize + \beta_3 sex_head + \beta_4 sex_participant + \beta_5 Education + \beta_6 lo_participation + \beta_7 use_drinking + \beta_8 water + \beta_9 income + \beta_{10} satisfaction + U_k$$

Mode 2:

$$pindex\ 2 = \beta_0 + \beta_1 famsize + \beta_2 sex_participant + \beta_3 education + \beta_4 lo_participation + \beta_5 use_drinking + \beta_6 water + \beta_7 income + U_k$$

Influence of group characteristics on participation

None of the group characteristics significantly influenced participation of beneficiaries in the BG meeting and decision making, except in the case of imposition of punishment. An insignificant relationship of heterogeneity of group implied that the existence of different group in a particular group could not influence beneficiary participation adversely. In other words, there was no group based discrimination among the beneficiaries in the group.

The size of the group did not significantly influence the rate of participation of beneficiaries. This result differed from that of earlier studies which established that collective action in larger groups became less effective. Active leadership in the group also did not influence participation. Among the operational rules, the imposition of punishment and distribution of receipts did not significantly influence the rate of participation. However, imposition of punishment of discontinuation of water supply or the imposition of a fine for non-payment of a tariff showed a significant and negative relationship to the rate of participation in decision making. This implies that defaulters either did not attend meetings or did not participate in the group discussions.

The possible reason for the insignificance of group characteristics may be the peculiar characteristics of the resource under consideration. In the case of drinking water supply, once the beneficiaries were satisfied with the existing arrangement, their interest in participating in the group meeting reduced, provided that there was no departure from the existing arrangement at any given time.

Influence of household characteristics

Household characteristics were relatively more influential in the participation indices relating to both attendance and decision making. Family size was strongly associated with the participation of beneficiaries in group meetings, as well as in decision making. The estimated elasticity of participation (Table 4.11) with respect to family size shows that, as the size of a family increased by 1%, participation in attendance increased by 0.62% and participation in decision making by 0.96%. The sex of the household head was another influencing factor affecting participation, results showing that male headed households participated more in group meetings compared to female headed households. The rate of participation in attending the meetings by male headed households was higher by nearly 8% when compared to female headed households. But the gender of household head did not influence the rate of participation in decision making. The sex of the participant was also an influential factor in deciding the rate of participation in attendance and decision making. The results show that male participants' participated more in group meetings and decision making when compared to female participants. This was contrary to the common notion that, in water related issues, women has more influence since they face more hardship in fetching water. Regression results indicate that, although men constituted only 34.5% of the participants, they have more influence in decision making as compared to women.

Table 4.11: Elasticity of participation in attendance in the meeting and decision making

Variable	Elasticity of participation in attendance in the BG meeting	Elasticity of participation in decision making
Family size	0.621	0.961
Percentage of family members with education	0.123	0.281
Percentage of family members participating in local organization	0.20	0.396
Per capita income	0.167	0.398
i Very poor	0.025	0.077
ii Poor	0.089	0.191
iii Middle income	0.156	0.259
iv High income	0.263	0.444

The percentage of family members with an education higher than 10th standard and the percentage of members involved in local organizations were the other two important variables influencing participation.

Both these variables represent the social capital of a household. Social capital is considered to be an important social condition that can facilitate coordinated action between individuals (Blomkvist & Swain, 2001). Elasticity of participation with respect to educational level of households showed that, as the level of education increased by 1%, the rate of participation in attendance increased by 0.12% and that of influence in decision making by 0.28%. Similarly, increase in the number of family members involved in other local organizations enhances participation in BG meetings, with the elasticity of participation in water user groups with respect to participation in other local organizations showing that a 1% increase in the participation in other local organizations influenced the attendance in group meetings by 0.20% and decision making by 0.40%.

The purpose for which water was used had a higher influence on participation rate compared to all other variables. As per the results, if a household was using water for drinking purposes to a large extent, their participation rate in the group meeting increased by 10%. But, perennial water scarcity in a household decreased the participation rate by 19%. One of the reasons for this may be that a majority of the households facing perennial water scarcity belong to the low income category, with a household monthly income less than Birr 1,353 (Table 4.12). Hence, participation of these households in the BG meetings might be costly and involve high opportunity costs for the beneficiaries.

Table 4.12: Distribution (%) of household by water scarcity and household income

Water Scarcity	Monthly household income				Total
	Very Poor < 1,350	Poor 1350 – 5,546	Middle 5,546 – 9,420	High Income > 9420	
Perennial scarcity	1.5	68.5	27.7	2.3	100.0 [105]
Seasonal scarcity	0.0	45.3	43.2	11.6	100.0 [77]
Bad quality	4.0	68.0	20.0	8.0	100.0 [40]
No Problem	0.0	34.3	34.3	31.4	100.0 [28]
Total	1.3	57.4	31.9	9.4	100.0 [250]

Note: [Actual number in brackets]

The above argument can be reinforced by the relationship between per capita income and participation rate. As per capita income increases, the participation rate also increases but by a very small percentage (See Tables 4.9 and 4.10). Elasticity of participation with respect to per capita income shows that, as income increases by 1%, the rate of participation in attendance increase by 0.17% and influence in decision making by 0.40%. Computation of elasticity for low, middle and high income categories shows that the influence of higher income groups in decision making was very high when compared to low income categories (Table 4.11). It shows that those who influenced the decisions of location of water supply and tariff, to a large extent, belonged to the high income category.

Stepwise regression analysis of both the models shows that within the different sets of variables, household characteristics were the important factors influencing the participation. Amongst household characteristics, sex of the participant in the group meetings and the educational level of the households were the most important variables influencing the rate of participation and decision making. None of the outcome variables significantly influenced the rate of participation in group meeting as well as decision making.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1. Summary of Findings

This study has tried to find the factors affecting community participation in water supply schemes using primary data collected from 250 households in the Dollo-bay Woreda, Somali Regional state. Indices of participation were prepared to capture the rate of participation in the BG meetings of community based water supply schemes. Two forms of indices were constructed, to capture participation in general and also the extent of involvement in decision making. In both cases, the distribution of households by participation index shows that the percentage of households actively participating in group meetings and in decision making was low.

Separate regression models were estimated in order to identify the factors affecting participation. In the first model, the participation index for attendance was taken as a dependent variable and variables representing group and household characteristics were taken as explanatory variables; in the second model, however, the participation index for decision making was considered to be a dependent variable.

The results of the study show some deviation from the existing literature on collective action. Previous studies on collective action and resource management have emphasized the importance of group characteristics, such as size of the group, presence of active leadership and organizational rules for the success of collective action (Olson, 1965; Baland & Platteau, 1996; Vedeld, 2000). But none of these group characteristics significantly influenced the participation of beneficiaries in the water supply schemes.

Narayan (1995) argued that the main reason for the lack of large scale participation was an unwillingness to frame the issue in institutional terms. She has argued that boiling down the issue of water supply to merely a technical problem reduces participation. In such circumstances, participation became an add-on task which could be taken up whenever it was convenient and required for the participants.

6.2. Conclusions

Among the three sets of factors, analysis shows that household characteristics were the most influential in affecting collective action. Within the household characteristics, the sex of the participants as well as

their educational level had the most important bearing on participation. The analysis shows that male participants had a more active participation in group meetings than their female counterparts.

Similarly, participation increased with a household's level of education and involvement in other local organizations. Household income of a household had negligible impact on participation but households from the higher income category had a larger influence on decision making. Contrary to expectations, the water scarcity suffered by a household negatively influenced participation in group meetings. However, other household characteristics influence participation in a beneficial way.

The insignificance of group characteristics in this study may be mainly due to the resource specific features of the product under consideration. In this study, water supply, as a resource, provided less of an incentive for participation than other resources. In the water supply context, once the system was installed and functioning without any interruption, it was observed that households were less interested in participating in the meetings. It is households' increased water demand that mainly drives them to participate in the community-managed schemes.

As previously mentioned, the majority of households in the region depend on their own wells for domestic water needs; piped water supply is in most cases only supplementary to water from private wells, especially in the summer season. This implies that user demand is an important factor determining participation in water supply schemes in Dollo-bay Woreda and explains why there was an insignificant relationship between participation and group characteristics. It is considered that if an initiative for collective action in resource management comes from the people themselves, there will be better participation.

In the context of community-based water supply schemes in Dollo-bay Woreda, the guidelines for implementation were provided by a funding agency and implementation was in the hands of supporting organizations. However, the active participation of beneficiaries in the community managed water supply programs in Dollo-bay Woreda was less evident. Under the CWS schemes, local people were given more responsibility in the O&M without substantial support from the government.

6.3. Recommendations

Based on the findings of the study the following points are recommended:

The government or NGOs should consider the provision of incentives to encourage community members to participate in water supply schemes actively.

Even if local people were given more responsibility in the Operations and Maintenance without substantial support from the government, both Government and NGOs need to give due attention in providing sustainable support on skill based training and supply of materials for O&M.

Community-based water supply institutions can empower the people by developing their capacity in various social interfaces during their participation in these institutions. Poor sections of society in particular can significantly benefit from the socializing and empowering capacities of these community-based institutions. Hence, regarding community-based water supply institutions as options for social development can lead to better outcomes.

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APPENDICES

ADDIS ABABAB UNIVERSITY

SCHOOL OF COMMERCE

SURVEY ON FACTORS THAT INFLUENCE COMMUNITY PARTICIPATION IN WATER SUPPLY SCHEMES: THE CASE OF DROUGHT AFFECTED COMMUNITIES AT DOLLO BAY, SOMALI REGIONAL STATE

FOR USE WITH HOUSEHOLD HEADS

Dollo Bay, 2019

INFORMED CONFIDENTIALITY AND CONSENT

I am working with _____

We are interviewing people here in order to find out about people's experience towards the community participation in water supply schemes under wash project. The purpose of the study is to generate information necessary for the planning of appropriate interventions and to track the trend on the practice of community participation and check on the decision making capability on community based water supply schemes. Therefore your honest and genuine participation by responding to the questions is highly appreciated.

Your answers are completely confidential. Your name will not be written on this form, and will never be used in connection with any of the information you tell me. This survey will take 20 minutes to ask the questions.

Would you be willing to participate?

[Signature of interviewer certifying that informed consent has been given verbally by respondent]

PART ONE: RESPONDENTS IDENTIFICATION & INTERVIEWER VISITS

IDENTIFICATION

WEREDA	
KEBELE	
HOUSEHOLD NUMBER	

INTERVIEWER'S VISITS

	VISIT 1	VISIT 2	VISIT 3
TIME			
DATE			
INTERVIEWER'S NAME			
RESULT*			

* RESULT CODES:

1. COMPLETED
2. RESPONDENT NOT AVAILABLE
3. PARTIALLY COMPLETED
4. REFUSED
5. OTHER _____

[SPECIFY]

C. QUESTIONNAIRE IDENTIFICATION NUMBER

□□□□

D. HEAD OF THE HOUSEHOLD

MALE

□

FEMALE

□

CHECKED BY SUPERVISOR: SIGNATURE _____

DATE _____

PART TWO: SOCIO DEMOGRAPHIC INFORMATION

Nº.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
A01	RELATIONSHIP TO THE HEAD OF THE HOUSEHOLD:	HEAD 1 WIFE , HUSBAND OR PARTNER 2 SON OR DAUGHTER 3 SON IN LAW OR DAUGHTER IN LAW 4 GRAND CHILD 5 PARENT 6 PARENT IN LAW 7 BROTHER OR SISTER 8 ADOPTEDOR FOSTER OR STEPCHILD 9 OTHER RELATIVE 10 NOT RELATED 11 DOES NOT KNOW 88	
A02	HOW OLD WERE YOU AT YOUR LAST BIRTHDAY?	AGE IN COMPLETED YEAR _ _ DOES NOT KNOW 88 NO RESPONSE 99	
A03	WHERE WERE YOU BORN?	CITY 1 TOWN 2 COUNTRYSIDE 3	
A04	HOW LONG HAVE YOU BEEN LIVING CONTINUOUSLY IN DOLLO BAY TOWN/ KORALEY KEBELE?	YEARS _ _ ALWAYS 5 NO RESPONSE 99	---A06
A05	JUST BEFORE YOU MOVED HERE, DID YOU LIVE IN A CITY, IN A TOWN, OR IN THE COUNTRYSIDE?	CITY 1 TOWN 2 COUNTRYSIDE 3	
A06	HAVE YOU EVER ATTENDED FORMAL SCHOOL?	YES 1 NO 2	---A08
A07	WHAT IS THE HIGHEST GRADE YOU HAD COMPLETED?	GRADE _ _ TECHNICAL/ VOCATIONAL CERT. 3 UNIVERSITY/ COLLEGE DIPLOMA 4 UNIVERSITY/ COLLEGE DEGREE 5	
A08	WHAT IS YOUR MARITAL STATUS?	MARRIED 1 SINGLE 2 DIVORCED 3 WIDOWED 4 SEPARATED 5	---B01

Nº.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
A09	HAVE YOU EVER GIVEN BIRTH?	YES 1 NO 2	---B01
A10	HOW MANY CHILDREN DO YOU HAVE? [If none, record '0/0'.]	NUMBER OF CHILDREN __ __ NO RESPONSE 99	

PART THREE: ECONOMIC INFORMATION

Nº.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
B01	DO YOU HAVE ANY INCOME FOR YOUR HOUSEHOLD?	YES 1 NO 2	---B04
B02	WHAT IS YOUR SOURCE OF LIVELIHOOD/INCOME?	PROFESSIONAL-TECHNICIAN 1 ADMINISTRATOR, MANAGER 2 SALES WORKER 3 FARMER 4 CASUAL LABOURER 5 MILITARY 6 PASTORALIST 7 OTHER _____ 8 [SPECIFY]	
B03	HOW MUCH WAS YOUR TOTAL HOUSEHOLD MONTHLY INCOME?	AMOUNT IN BIRR __ __ __ DOES NOT KNOW 8 NO RESPONSE 9	
B04	WHAT IS THE MAIN SOURCE OF DRINKING WATER FOR MEMBERS OF YOUR HOUSEHOLD?	<i>PIPED (TAPE)</i> PIPED INTO DWELLING 1 PIPED INTO COMPOUND 2 PIPED OUTSIDE THE COMPOUND 3 <i>OPEN WELL/SPRING</i> OPEN WELL 4 OPEN SPRING 5 <i>COVERED WELL/SPRING</i> COVERED WELL 6 COVERED SPRING 7 <i>SURFACE WATER</i> RIVER 8 POND/LAKE/DAM 9 RAINWATER 10 OTHER _____ 11 [SPECIFY]	

Nº.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
B05	WHAT KIND OF TOILET FACILITY DO MOST OF MEMBERS YOUR HOUSEHOLD USE?	FLUSH TOILET 1 <i>PIT TOILET/LATERINE</i> TRADITIONAL PIT TOILET 2 VENTILATED IMPROVED PIT LATERINE 3 NOT FACILITY/BUSH/FIELD 4 OTHER _____ 6 [SPECIFY]	
B06	DOES YOUR HOUSEHOLD HAVE: ELECTRICITY? A RADIO? A TELEVISION? A TELEPHONE? AN ELECTRIC MITAD? A KEROSENE LAMP/PRESSURE LAMP? A BED/TABLE?	YES NO ELECTRICITY 1 2 A RADIO 1 2 A TELEVISION 1 2 A TELEPHONE 1 2 AN ELECTRIC MITAD 1 2 A KEROSENE LAMP 1 2 A BED/TABLE 1 2	
B07	DOES YOUR HOUSEHOLD HAVE: OWN THE HOUSE IT IS LIVING IN? HAVE CROPLAND? HAVE CATTLE/CAMELS? HAVE HORSE/MULE/DONKEY? HAVE SHEEP/GOATS?	YES NO OWN HOUSE 1 2 CROP LAND 1 2 CATTLE/CAMELS 1 2 HAVE HORSE/MULE/DONKEY 1 2 SHEEP/GOATS 1 2	
B08	WHAT TYPE OF FULE DOSE YOUR HOUSEHOLD MAINLY USE FOR COOKING?	ELECTRCITY 1 LPG/NATURAL GAS 2 BIOGAS 3 KEROSEN 4 CHARCOAL 5 FIREWOOD, STRAW 6 DUNG 7 OTHER _____ 6 [SPECIFY]	
B09	MAIN MATERIAL OF THE FLOOR. [Record observation]	EARTH/SAND 1 DUNG 2 WOOD PLANKS 3 REED/BAMBOO 4 PARQUET OR POLISHED WOOD 5 VINYL SHEETS/TILES 6 CEMENT 7 CEMENT TILES/BRICK 8 CARPET 9 OTHER _____ 6 [SPECIFY]	

Nº.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
B10	MAIN MATERIAL OF THE ROOF. [Record observation]	COROGATED IRON 1 CEMENT/CONCRETE 2 WOOD AND MUD 3 THACH 4 REED BAMBOO 5 PLASTIC SHEET 6 MOBILE ROOFS OF NOMADS 7 OTHER _____ 6 [[SPECIFY]	
B11	DOES ANY MEMBER OF YOUR HOUSEHOLD OWN: A BICYCLE? A MOTERCYCLE OR MOTER SCOOTER? A CAR OR TRUCK? A HORSE OR MULE FOR HUMAN TRANSPORT ONLY?	YES NO BICYCLE 1 2 MOTERCYCLE/SCOOTER 1 2 CAR/TRUCK 1 2 HORSE/MULE 1 2	

PART FOUR: OPINION ON COMMUNITY PARTICIPATION IN WATER SUPPLY SCHEMES

Nº.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
C01	HAVE YOU EVER HEARD OF WATER SUPPLY SCHEMES UNDER WASH PROJECT AT DANISH REFUGEE COUNCIL "DRC"?	YES 1 NO 2	---♥
C02	HAVE YOU YOURSELF BEEN AIDED BY THE PROJECT?	YES 1 NO 2	---C04
C03	SINCE WHEN HAVE YOU BEEN AIDED BY THIS PROJECT?	YEAR _____ DURING INFANCY 5 DOES NOT KNOW 8	
C04	HAS ANY OF YOUR FAMILY MEMBERS BEEN BENEFITED FROM THE PROJECT?	YES 1 NO 2	
C05	DO YOU THINK THE PROJECT SHOULD BE CONTINUED, OR DISCONTINUED?	CONTINUED 1 DISCONTINUED 2 DOES NOT KNOW 88	---C08

♥ Complete the questionnaire

Nº.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
C06	<p>[Filter: if continued – C05]</p> <p>WHY DO YOU THINK THE PROJECT SHOULD BE CONTINUED?</p> <p>[Record all reasons mentioned]</p>	<p>SATISFIES COMMUNITY DEMAND 1</p> <p>ALLOWS COMMUNITY PARTICIPATION 2</p> <p>ENCOURAGE PEOPLE MAKE DECISIONS 3</p> <p>ORGANIZED ‘BG’ MEETING 4</p> <p>WORKING ON ‘WASH’ TO PLEASE DRC 5</p> <p>IT BELONGS TO THE COMMUNITY 6</p> <p>TO ENHANCE WATER SUPPLY SCHEMES 7</p> <p>TO INCREASE WATER AVAILABILITY 8</p> <p>IT IS AN ‘NGO’ 10</p> <p>OTHER _____ 11</p> <p>[SPECIFY]</p>	
C07	<p>[Filter: if discontinued – C05]</p> <p>WHY DO YOU THINK THE PROJECT SHOULD BE DISCONTINUED?</p> <p>[Record all reasons mentioned]</p>	<p>BAD PROJECT 1</p> <p>AGAINST COMMUNITY’S WILL 2</p> <p>CREATES COMPLICATION 3</p> <p>I HAVE PAINFUL EXPERIENCE 4</p> <p>STOPS DECISION MAKING CAPABILITY 5</p> <p>AVERTS COMMUNITY PARTICIPATION 6</p> <p>OTHER _____ 8</p> <p>[SPECIFY]</p>	
C08	<p>WHAT DOES YOUR FAMILY MEMBERS THINK ABOUT THIS PROJECT?</p>	<p>SUPPORTS TO BE CONTINUED 1</p> <p>DOES NOT SUPPORT 2</p> <p>DO NOT KNOW 88</p>	
C09	<p>WHO USUALLY FETCHES WATER FOR THE FAMILY?</p>	<p>ADULT MEN 1</p> <p>ADULT WOMEN 2</p> <p>BOYS 3</p> <p>GIRLS 4</p> <p>OTHER _____ 8</p> <p>[SPECIFY]</p>	
C10	<p>HOW FAR IS THE WATER SOURCE FROM YOUR DWELLING?</p>	<p>WITHIN 200 METERS 1</p> <p>WITHIN 500 METERS 2</p> <p>WITHIN 1 KILO METERS 3</p> <p>MORE THAN 1 KILO METERS 4</p> <p>DOES NOT KNOW 88</p> <p>NO RESPONSE 99</p>	

№.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
C11	HOW OFTEN DO YOU NORMALLY COLLECT WATER IN A WEEK?	FREQUENCY PER WEEK _ _ DOES NOT KNOW 88 NO RESPONSE 99	
C12	HOW MUCH TIME DO YOU SPEND [ROUND TRIP] TO COLLECT DRINKING WATER?	LESS THAN 30 MINUTES 1 BETWEEN 30 MINUTES AND 1 HOUR 2 MORE THAN 1 HOUR 3 DOES NOT KNOW 88 NO RESPONSE 99	
C13	HOW MANY LITERS OF WATER DO YOU COLLECT EACH DAY DURING DRY SEASON?	LESS THAN 10 LITERS 1 11 – 20 LITERS 2 21 – 30 LITERS 3 31 – 40 LITERS 4 MORE THAN 40 LITERS 5 DOES NOT KNOW 88 NO RESPONSE 99	
C14	HOW MANY LITERS OF WATER DO YOU COLLECT EACH DAY DURING WET/RAINY SEASON?	LESS THAN 10 LITERS 1 11 – 20 LITERS 2 21 – 30 LITERS 3 31 – 40 LITERS 4 MORE THAN 40 LITERS 5 DOES NOT KNOW 88 NO RESPONSE 99	
C15	WHAT DO YOU THINK OF THE QUALITY OF WATER YOU USED FOR DRINKING? [TICK ALL THAT APPLY]	CLEAN AND CLEAR 1 CLOUDY 2 SLIGHTLY CLOUDY BAD TASTE 3 BAD SMELL/ODOR 4 DOES NOT KNOW 88 NO RESPONSE 99	
C16	DO YOU TREAT WATER?	YES 1 NO 2 NO RESPONSE 99	---C18
C17	[Filter: if Yes – C16] IF YES, WHAT TYPE OF WATER TREATMENT METHOD IS USED? TICK ALL THAT APPLY)	CHEMICAL WATER PURIFIERS 1 FILTERING 2 ALLOWING PARTIES TO SETTLE DOWN (BASIC SEDIMENTATION) 3 BOILING 4 NOTHING 5 OTHER _____ 8 [SPECIFY]	

Nº.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
C18	[Filter: if No – C16] WHY?	WATER IS SAFE 1 IT IS EXPENSIVE 2 DONOT KNOW HOW TO TRAET 3 OTHER _____ 8 [SPECIFY]	
C19	WHAT DO YOU USE TO COLLECT DRINKING WATER?	OPEN BUCKET 1 BUCKET WITH LID 2 JERRY CAN 3 BOTTLE 4 OTHER _____ 8 [SPECIFY]	
C20	WHAT IS THE CAPACITY OF THE WATER CONTAINER YOU USE TO COLLECT DRINKING WATER AND HOW MANY?	NUMBER OF CONTAINERS _ _ LESS THAN 5 LITERS 1 5 LITERS 2 10 LITERS 3 15 LITERS 4 20 LITERS 5 OTHER _____ 8 [SPECIFY]	
C21	HOW MANY WATER CONTAINERS DO YOU HAVE FOR WATER STORAGE AND SIZE?	NUMBER OF CONTAINERS _ _ LESS THAN 5 LITERS 1 5 LITERS 2 10 LITERS 3 15 LITERS 4 20 LITERS 5 OTHER _____ 8 [SPECIFY]	
C22	DO YOU PERCEIVE THE SURROUNDING TO THE NEAREST WATER POINT IS SAFE AND SECURE ESPECIALLY FOR WOMEN AND GIRLS?	YES 1 NO 2 OTHER _____ 8 [SPECIFY]	
C23	HOW DO YOU RATE THE EXTENT OF WATER SCARCITY ?	PERENNIAL SCARCITY 1 SEASONAL SCARCITY 2 BAD QUALITY 3 NO PROBLEM 4 OTHER _____ 8 [SPECIFY]	

№.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
C24	WHAT DO YOU THINK ABOUT THE WATER STATUS SERVED TO THE USERS?	IMPROVED PRIMARY WATER SOURCE 1 IMPROVED SECOND'Y WATER SOURCE 2 NOT IMP. PRIMARY WATER SOURCE 3 NOT IMP. SECONDARY WATER SOURCE 4 DOES NOT KNOW 88 NO RESPONSE 99	
C25	DOU YOU HAVE A BENEFICIARY GROUP THAT WORKS ON WATER SUPPLY SCHEMES?	YES 1 NO 2 DOES NOT KNOW 88 NO RESPONSE 99	--C30
C26	HOW MANY MEMBERS DOES YOUR BENEFICIARY GROUP HAVE?	SIZE OF THE BG __ __ DOES NOT KNOW 88 NO RESPONSE 99	
C27	HOW MANY MEMBERS OF A HOUSEHOLD WILL BE ALLOWED TO ATTEND AT GROUP MEETINGS IN THE COMMUNITY-BASED WATER SCHEMES?	ONE PERSON 1 TWO PERSONS 2 ALL THE MEMBERS 3 OTHER _____ 8 [SPECIFY] DOES NOT KNOW 88 NO RESPONSE 99	
C28	HOW DO YOU RATE YOUR ATTENDANCE AT THE BENEFICIARY GROUP MEETINGS?	ALWAYS 1 REGULARLY 2 OCCASIONALLY 3 NEVER ATTEND 4 DOES NOT KNOW 88 NO RESPONSE 99	--C30
C29	HOW OFTEN DO THE BG MEETINGS HOLD ON COMMUNITY-BASED WATER SCHEMES?	ONCE A DAY 1 TWICE A WEEK 2 ONCE A WEEK 3 ONCE A MONTH 4 OTHER _____ 8 [SPECIFY] DOES NOT KNOW 88 NO RESPONSE 99	

№.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
C30	HOW DO YOU RANK YOUR LEVEL PARTICIPATION [ATTENDANCE] IN MEETINGS AT COMMUNITY-MANAGED WATER SUPPLY SCHEMES [CSW]	NO PARTICIPATION 1 LOW PARTICIPATION 2 MODERATE PARTICIPATION 3 HIGH PARTICIPATION 4 ACTIVE PARTICIPATION 5 DOES NOT KNOW 88 NO RESPONSE 99	
C31	HOW DO YOU RANK YOUR LEVEL PARTICIPATION [ATTENDANCE] IN MEETINGS AT DOLLO BAY WATER AUTHORITY[DWA]?	NO PARTICIPATION 1 LOW PARTICIPATION 2 MODERATE PARTICIPATION 3 HIGH PARTICIPATION 4 ACTIVE PARTICIPATION 5 NO RESPONSE 99	
C32	HOW DO YOU RANK YOUR LEVEL PARTICIPATION [ATTENDANCE] AT DANISH REFUGEE COUNCIL [DRC]	NO PARTICIPATION 1 LOW PARTICIPATION 2 MODERATE PARTICIPATION 3 HIGH PARTICIPATION 4 ACTIVE PARTICIPATION 5 NO RESPONSE 99	
C33	DO YOU MAKE ANY SUGGESTIONS RELATING TO DEVELOPMENT INTERVENTIONS IN A GROUP MEETING?	ALWAYS 1 REGULARLY 2 OCCASIONALLY 3 NEVER 4 NO RESPONSE 99	
C34	DO YOU MAKE ANY INFLUENCES DECISIONS RELATING TO DEVELOPMENT INTERVENTIONS IN A GROUP MEETING?	ALWAYS 1 REGULARLY 2 OCCASIONALLY 3 NEVER 4 NO RESPONSE 99	- C38
C35	HOW DO YOU RATE YOUR INFLUENCE IN DECIDING RELATING TO WATER SUPPLY?	VERY LARGE INFLUENCE 1 LARGE INFLUENCE 2 MEDIUM INFLUENCE 3 LITTLE BIT INFLUENCE 4 NOT AT ALL 5 DOES NOT KNOW 88 NO RESPONSE 99	

№.	QUESTIONS AND FILTERS	CODING CATEGORY	SKIP
C36	HOW DO YOU RATE INFLUENCE IN DECIDING RELATING TO THE LOCATION OF THE WATER SUPPLY?	VERY LARGE INFLUENCE 1 LARGE INFLUENCE 2 MEDIUM INFLUENCE 3 LITTLE BIT INFLUENCE 4 NOT AT ALL 5 DOES NOT KNOW 88 NO RESPONSE 99	
C37	HOW DO YOU RATE YOUR INFLUENCE IN DECIDING RELATING TO THE MONTHLY TARIFF?	VERY LARGE INFLUENCE 1 LARGE INFLUENCE 2 MEDIUM INFLUENCE 3 LITTLE BIT INFLUENCE 4 NOT AT ALL 5 DOES NOT KNOW 88 NO RESPONSE 99	
C38	HOW DO YOU RANK YOUR OVERALL SATISFACTION IN THE WATER SUPPLY SYSTEM AT DOWELING?	VERY SATISFIED 1 SATISFIED 2 NEVER SATISFIED 3 DOES NOT KNOW 88 NO RESPONSE 99	

Thank you for your time