

Assessing Community Participation In Managing Drinking Water Supply Facilities: The Case of Nedjo Woreda, West Wellega Zone, Oromia Regional State of Ethiopia.

Evaluación de la participación comunitaria en gestión de las instalaciones de suministro de agua potable: el caso de Nedjo Woreda, zona de West Wellega, estado regional de Oromia en Etiopía

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ABSTRACT

Good management of drinking water supply facility is an important factor in ensuring access to safe water but there are different factors that hinder community participation on managing and protecting different water supply facilities and this study was conducted to identify the different factors that affect community participation on managing water supply facilities and to examine extent of their participation in the study area. The result of the study is intended to help stakeholders and planners to devise new solution that enhance communities participation in managing water source that can ensure sustainability of quality water consumption. In order to achieve these objectives a cross sectional survey design was conducted. The quantitative data were collected from 200 randomly selected households in the study area and they were stratified into participant and non-participant. The data were analyzed using descriptive statistics such as mean, standard deviation, percentage and frequency distribution. T-test and Chi-square tests were also employed to describe their characteristics. The result shows that among eight independent variables hypothesized, four of them were significant at less than 10 % probability level. These are: sex of household head, family size, awareness on importance of water source management, participating in water source management, training, amount of water consumption and being member of water committee. Thus, designing appropriate strategy to increase community participation, creating awareness on importance of water source management, provide training on managing drinking water supply facilities and encouraging women participation in managing water source should be take into account.

Keywords: Water, Community Participation, Facility, management.

RESUMEN

La buena gestión de las instalaciones de suministro de agua potable es un factor importante para garantizar el acceso al agua potable, pero existen diferentes factores que obstaculizan la participación comunitaria en la gestión y protección de diferentes instalaciones de suministro de agua y este estudio se realizó para identificar los diferentes factores que afectan la participación comunitaria en la gestión. instalaciones de abastecimiento de agua y examinar el alcance de su participación en el área de estudio. El resultado del estudio está destinado a ayudar a los interesados y planificadores a idear una nueva solución que mejore la participación de las comunidades en la gestión de la fuente de agua que pueda garantizar la sostenibilidad del consumo de agua de calidad. Para lograr estos objetivos se realizó un diseño de encuesta transversal. Los datos cuantitativos se recopilaron de 200 hogares seleccionados al azar en el área de estudio y se estratificaron en participantes y no participantes. Los datos se analizaron mediante estadística descriptiva como media, desviación estándar,

porcentaje y distribución de frecuencias. También se emplearon pruebas T y Chi-cuadrado para describir sus características. El resultado muestra que entre ocho variables independientes hipotetizadas, cuatro de ellas fueron significativas a un nivel de probabilidad menor al 10%. Estos son: sexo del jefe de hogar, tamaño de la familia, conciencia sobre la importancia del manejo de la fuente de agua, participación en la gestión de la fuente de agua, capacitación, cantidad de consumo de agua y ser miembro del comité de agua. Por lo tanto, se debe tener en cuenta el diseño de una estrategia adecuada para aumentar la participación de la comunidad, crear conciencia sobre la importancia de la gestión de las fuentes de agua, proporcionar capacitación sobre la gestión de las instalaciones de suministro de agua potable y fomentar la participación de las mujeres en la gestión de las fuentes de agua.

Palabras clave: Agua, Participación Comunitaria, Facilidad, gestión.

INTRODUCTION

Water plays a vital role in the survival of living things (Moss, 2009) and it is a part of the life supporting systems and it is one of the precious gifts to mankind. A sustainable supply of adequate safe water, sanitation and hygiene services are fundamental for a healthy, productive and dignified life, yet about 2 billion of the world's population is still struggling to achieve these services (WHO, 2010)

Lack of access to safe drinking water and basic sanitation is one of the problems affecting billions of people around the world (Hesperian Foundation, 2005). This is particularly so in the developing countries where level of access to water and water related facilities are said to be very low and rural water supply programs in developing countries frequently fail to deliver benefits to society in the long run.

Ethiopia is situated at the area where the weather is complimented with relatively higher amount of rainfall. This has given the country with enormous water resource potential. Accordingly, it was estimated that the country has an annual surface runoff of 122 billion cubic meters of water (EWRMP, 2001). The country's groundwater potential has been estimated to be 2.6 billion m³ (ADF, 2005). In spite of this immense water resource potential, sizable proportion of the country used to have faced uneven water distribution and inconsistency of its accessibility in terms of time and space (IMWI, 2007).

In the country different actors concerning rural water supply and sanitation has been using different approaches in issuing community mobilization and targeting the expansion of coverage in rural water supply and sanitation and ensuring its sustainability as final goal. At this time, community managed project (CMP), woreda managed project (WMP), NGO managed project and self supply project approaches have been working in different rural dwellers (WIF, 2011, Mebit, 2013).

According to the FDRE Ministry of Water and Energy (2009), average access to clean and safe water supply in Ethiopia is about 17% of the total population. This can be cited as an example of a very low supply and coverage level even by the Sub-Saharan African standards. It must be noted here that the coverage figures may even reflect much worse situations considering the unreliability and unsustainability of the supply of safe water. Water crisis also forces millions of people mainly women and young girl's to spend hours in collecting and carrying water from long distance, which restricts their opportunities and choices.

Experiences around the globe proved that involving the beneficiaries will help to make the water resources sustainable, create sense of ownership, legitimacy and protection of infrastructure, involving the community in protecting and safeguarding of the water sources is one of the alternative ways of managing the water resources in rural areas. The community should actively get involved in the process of identifying water and sanitation problems, designing solutions and managing systems by their own in order to secure long-term sustainability of community managed water supply and sanitation services. Training the community in managing,

maintaining and keeping the sanitation of water, and providing hygiene education to the community is a very critical activity to ensure sustainable use of the water resources (lily Mersha, 2014).

The major sources of drinking water for the vast majority of the rural population (84% of the country total) in Ethiopia are surface run offs represented by unprotected springs, ponds, rivers, and hand dug wells whose health risk is significant as they are exposed to contamination caused by human beings, livestock, wildlife and uncontrolled flooding, (Tadesse, 2012). Similarly in Nedjo woreda, the majority of households use unprotected water sources and travel long meter to fetch water. All these factors lead to reduced water usage at the household level.

Therefore depending on this background the study will conduct in Nedjo district to understand the participation of people in community based management of water supply facilities and to find out the factors that affect their participation.

MATERIAL AND METHODS

Description of the Study Area: Location: The study was carried out in Nedjo district. Nedjo is one of West Wellega woreda which is located at 190 km west of Nekemte. It has an area of about 400km² and one urban center, i.e., mendi town district capital. The woreda has common boundaries with beneshangulgumuz, boji, and mendi districts. Topographically, it is characterized by mountains (weshi and bebula mountain cahaims) dissected plateaus, and plains river, such as Aniso, Wanja, Sogido, etc., and intermittent streams like Awaso, Urgeyi, etc., are flowing through the woreda (<http://en.wikipedia.org/wiki/nedjo>- (woreda).

Climate: The woreda is classified in to Dega (12%), WoinaDega (63%) and kola (24%) climatic zones. Nit sols and orphic acrisols are dominant soil types found Nedjo. High forest, woodland, reverie and plantation forests are available in the district. But there is no wildlife conservation area. However, ape, warthog, pig tiger, lion, civet cat and antelope are found in the district. Rainy season extends from June to September with highest rain fall usually recorded in august. The mean annual rain fall varies between 800 and 2000 millimeters. The mean temperature of the study area is 16 degree Celsius. (<http://en.wikipedia.org/wiki/mana>- (Nedjo).

Economic Activities: Agricultural activity is the main source of economy in the area. From the total, 400km² land of the district, 229.2 (57.3%) km² is under cultivation whereas the remaining areas are allotted for grazing land, forest land and for others services. The major crops grown in the woreda are teff, coffee, fruit, maize, sorghum and vegetables (Agriculture Office of Nedjo woreda, 2015).

Research Design: A cross sectional research design was used to collect quantitative data for descriptive survey. Interview schedule was prepared to collect data from sample respondents.

Sampling Procedures and Sample Size: For the purpose of this study, multistage sampling technique was used. Out of six rural woreda one of the woredas is selected purposively based on the intention of the researcher, representational nature, accessibility, financial and time constraints. At the Second stage from a total of 24 kebeles in Nedjo woreda, Gida kumbi and Abo kami were selected by using simple random sampling. At the third stage, households in the selected villages were stratified into participant and nonparticipants in water resource management based on source provided. At the fourth stage, out of 2245 population in the two kebeles, 200 sampled households were determined for this study and sample households were randomly selected from each stratum using probability proportional to size (PPS). Table 1 shows how the number of the respondents from the two kebeles was determined.

Table 1: Sampling design

No	Name of the kebele	Households			Sample households		
		participant	Non participant	Total	participant	Non participant	Total
1	Gida Kumbi	495	735	1225	52	56	108
2	Abo Kami	380	640	1020	48	44	92
	Total	850	1395	2245	100	100	200

Source: Agriculture office of Nedjo woreda (2017)

Figure 1 show the procedure used to select the sample respondents of this study.

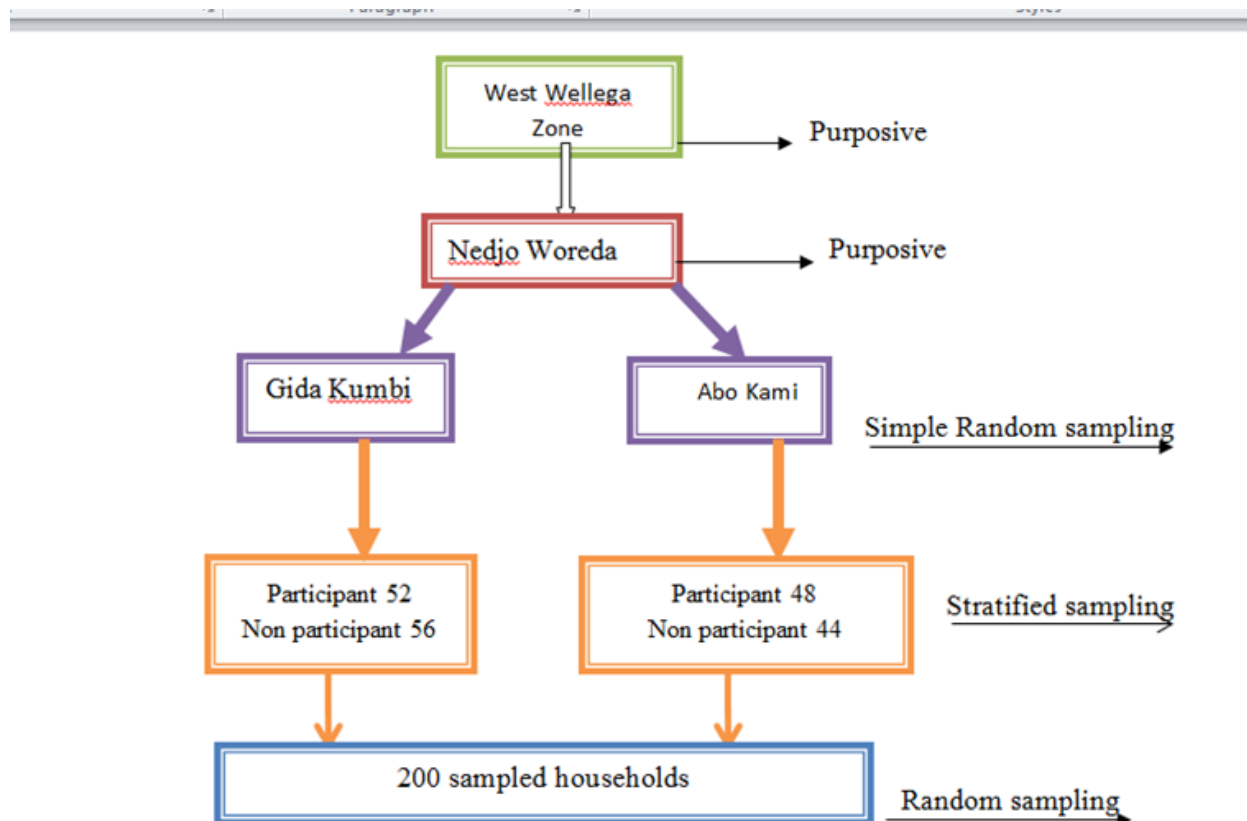


Figure 1: sampling procedure

Figure 1: sampling procedure

Types and Source of Data: The data that was gathered at household level includes the type of water source, level of participation of beneficiaries, and ownership of the scheme. Both quantitative and qualitative data

were collected from primary and secondary sources. Primary data was collected from 200 sample households that are selected from sample rural villages. The primary data of sample households include information on: household's demographic characteristics (education, age, family size, gender, marital status), water supply related information (i.e. source of water supply, lifting mechanism, site selection, type of technology), level of participation of household (i.e. type of participation, community contribution, source of fund, water collection, sources of water) water management (composition of water committee, reporting mechanism) and household water use practices. Secondary data about population, water use pattern, infrastructure situation, training on water resource management, level of community participation etc. were collected from other sources.

Data Collection Method: In order to meet the objectives of the study, an interview schedule was used to assess household's opinions and practice on participation to construct, maintenance, problems and benefits of water resource management practices. Discussions were also held with households so as to generate additional information for the study.

Data Analysis Methods: In this study, descriptive statistics was used to explain the different socio-economic characteristics of the sample units. Simple descriptive statistical procedures like percentage, mean, frequency of occurrence and other tests of significance such as chi-square test and t-test were employed to test the statistical significance of the variables for both dummy and continuous variables respectively. The results obtained from different categories of the sample households were interpreted accordingly.

Definition of Variables and Hypothesis-Dependent variables: The dependent variable is the decision of households to participate in managing water supply facility and it is dummy variable. Yes and No category were used. Yes is given a score of one (1) if household head or members participated in managing drinking water and otherwise 0.

Definition of Variables and Hypothesis-Independent variables: The independent or explanatory variables are variables that tend to explain and influence dependent variable. The explanatory variables that were hypothesized to affect community participation are presented below.

Age of the household head (AGE): It is a continuous variable measured in years. As the person becomes older, he/she becomes willing to participate in water resource management; in other words with more experience in life, a person can become more or less responsible for water management. So it is hypothesized that as the age of the household head increases the probability to participate and level of participation will improve. It is expected that younger household heads can have less responsibility in managing water resources and tend to engage themselves in other activities. Younger household's heads are more reluctant to participate in water resource management (Getou, 2009).

Sex of household head (SEX): It is a dummy variable, which takes a value of 1 if the household head is male and 0 otherwise. Socio-cultural values and norms prohibit females 'freedom of mobility and participation in different meetings and eventually have limited access to information (Ellis and Meudhara, 1995). Compared to them, males have better information about water resource management so they are more likely to participate in water resource management. Therefore, it is expected that male status of household head is positively related to decision to participate and level of participation in water resource management.

Education level of the household head (EDU): It is a continuous variable measured as a number of years in schooling a household head completed. Education enhances the ability to perceive, interpret and respond to events. It is expected to increase the probability of participation in water resource management as educated person has the ability to obtain and process new information in order to make decision (Paulos, 2002). Therefore, in this study, education is expected to positively influence decision to participate and level of participation in water resource management and sanitation facility.

Family size (FSZ): It is a continuous variable which indicates the number of persons living under the roof of the household. It is expected that as the size of the household increases participation in water resource increases

(Dawit, 2009). This indicates families with large number involve more in water resource management activities. On the other hand, it is also expected that as the size of family member increases the demand for water also increases. The household who has large number of family member is expected to spend more money for water consumption to meet the water need of the entire family. Thus, in this study, family size is hypothesized to have positive influence on participation in water resource management and level of participation in managing water resources.

Water committee membership (WATCOMMB): It is a dummy variable, which takes a value of 1 if the household is a member of water committee and 0, otherwise. Water committee is the most common form of rural water resource management. The functions of water committee, in principle are to represent the community in connection with the development partners, organize community contribution in terms of labour, cash, material, etc. Keeping project records of expenditure and payment, collecting water tariffs, conducting water committee meetings to discuss and decide on issues and problems, and informing the communities on regular basis on the decisions reached are expected to enhance participation and extent of participation in water resource management (Aschalew, 2009).

Participation in water management training (PARWATMGMTR): It is a dummy variable that takes a value of 1 if a person has ever participated in any kind of training in water resource management and 0 otherwise. For better management and maintenance of the water resources, skill training on construction and maintenance of the water resource is very important. Absence of maintenance of water schemes is the main obstacle for the sustainable use of the resource. When the community lack certain technical and practical skills, training becomes important to transfer specific knowledge and skills. Thus, members of the community who have participated in training about maintenance and management of water resource are more likely to be responsible than those who did not participate in training (Tesfaye, 2006). Therefore, training in areas of water resource maintenance is expected to influence decision to participate and extent of participation in water resource management positively.

Awareness about importance of water resource management (AWINWATRESO): It is a dummy variable that takes a value 1, if he or she is aware about the benefits of efforts exerted in water management and 0 otherwise. If an individual is well aware about the benefit of participation in water resource management, he/she will gain some understanding of how water resources become sustainable for future generation and hence, people most likely tend to participate in managing water supply (Gabriela, 2004). Hence, it is hypothesized to be positively correlated with participation and extent of participation in water resource management.

Amount of water consumption (AMOWACON): Refers to the amount of water a sample household consumes per day. Basic water requirement (BWR) is defined as water requirement in terms of quantity and quality for the four basic needs of drinking water, human hygiene, sanitation service and cooking needs. This standard is defined by WHO guideline as 20 liters per capita per day (Admassu *et al.*, 2002). It is obvious that as consumption of water increases sustainability of water resource will decrease. Despite this, the relationship between consumption pattern and decision to participation and the extent of participation is hypothesized to be indeterminate.

RESULTS AND DISCUSSION

This section describes the household characteristics by using descriptive statistics such as mean, percentage and standard deviation and inferential statistics such as Chi-square test for categorical variables and independent t-test for continuous variables. The data presented were processed and analyzed using Statistical Package for Social Sciences (SPSS). The analyzed data was presented tables, graphs and narrative explained. The

two groups (participant and non participant) of sample respondents were compared and contrasted with respect to independent variables.

In this study 200 household were selected for survey data collection on participation of community in managing drinking water supply facilities in the study area. Out of 200 sampled households, 100 (50%) and 100 (50%) were participants and non-participants in drinking water supply facilities management respectively.

Social-economic factors and community participation: Socio economic status of household is an important factor in affecting community participation in managing drinking water supply facilities in the study area. In this research sex of household head, age of household head, family size, education level of respondent were proposed variables.

Sex of Respondent Households: The results in table 2 shows that out of 200 respondents, 70% of them were males and 30% female headed. From the total participants households 84% were males while 16% were female headed. Similarly, 56% non participant households were males and 44% were female headed. This clearly shows the existing gap between male headed and female headed households in terms of participation in water source management. The Chi-square test indicated that the sex of households had significant difference between being participant and non participants at 5% significant level. This can be explained that in the study area division of labor is largely governed by gender, which allows men to be responsible managing drinking water source, while women and girls are responsible for fetching water. Regarding the direction relationship, the result of bivariate correlation analysis revealed the presence of positive association ($r=0.306$, $P=0.031$) between water source management and sex of household head. Therefore, the result clearly shows male headed households were high participation in water source management. This finding is congruent with findings of Lily, (2014)

This study shows that 98% of respondents reported that water collected by women and girls, whereas men are more involved in water managing activities. However drinking water more concerned women within household consumption their participation in managing the source is less than the requirement.

Table 2: Sex composition of sample HH heads

Sex	Participation in MDWS					
	No		Yes		Total	
	N	%	N	%	N	%
Male	56	56	84	84	140	70
Female	44	44	16	16	60	30
Total	100	100	100	100	200	100
χ^2						4.667
P-value						0.031**
R						0.306**

**Significant at less than 5% probability level. Source: Own survey, 2017

Age of Respondent: Age is one of the demographic factors that are useful to describe households. In this study it was used to measure age of the household head in years. The age category of the respondents is

presented in table 3. Accordingly, 42% and 34% were found less than 40 year and above 50 year respectively. Similarly, 24% of participant found between 41-50 years of age. The statistical analysis table 2 revealed that there is no significant difference in the age of the household head between participant and non participant households. Moreover, result of bivariate correlation also confirmed the positive but insignificant relationship ($r=0.069$, $P=0.633$) of age with participation of drinking water supply families management. Implying even if the correlation between two variables is not significant, the variables may be correlated but the relationship is not linear (the two variables is not linearly correlated).

Table 3: Age of the sample household heads

Age category In years	Participation in MDWS					
	No		Yes		Total	
	N = 100	%	N= 100	%	N= 200	%
Under 40	44	44	40	40	84	42
41- 50	24	24	24	24	48	24
Above 51	32	32	36	36	68	34
χ^2						1.311
P-value						0.272
R						0.069
P						0.633

Source: Own survey, 2017

Family Size of the household: Family size of the household was expressed in terms of the number of family member living together in a house and it was expected to have association with participation in drinking water supply facilities management. In this study, the family size of the sample households mostly ranges 4-6 and above 7 members per household that is 40% and 38% reported respectively. The participants' family size existing between 1-3, 4-6 and above 7 is 28, 24 and 48% respectively. The chi-square in table 4 shows that, there is significant difference in family size between participant and non-participant households. Moreover, result of bivariate correlation analysis also shows positive and insignificant relationship ($r=0.076$, $p=0.652$) of family size and participation in water source management. Implying the relation between the two variables is positive but not linearly correlated.

Table 4: Family size of the sample household heads

Family Size	Participation in MDWS					
	No		Yes		Total	
	N	%	N	%	N	%
1-3	16	16	28	28	44	22
4-6	56	56	24	24	80	40
>7	28	28	48	48	76	38
Total	100	100	100	100	200	100
χ^2						6.293
P-value						0.043**
R						076
P						0.652

**Significant at 5% probability level. Source: Own survey, 2017

Educational Level of Respondents: The result in table 5 shows that 68 % of the respondents in the area had formal education whereas 32 % had no formal education. Regarding participant households, 68 % had formal education where the rest 32 % households had no formal education. On the other hand non participant households 68% had formal education while 32% had no formal education. The Chi-square value shows that the education level of households had no significant difference between participant and nonparticipant household. Also the bivariate correlation confirms the existence of positive ($r=0.036$, $p=0.803$) and insignificant association between education and management of water source. This implying that there was a positive and non-linear relationship between educations

Factors influencing community participation in managing drinking water supply facilities in the study area.

Awareness about the importance of participation in water resource management: Awareness helps to have better understanding about the importance of water resource management for human consumption and helps to increase community participant in water resource management. Thus awareness about water resource management is a key concern in the water resource development for human being consumption. In table 6 it is shown that out of the total sample households, 70% are aware about the importance of participation in water resource management and 30% reported lack of awareness. Of the participant 96% and non- participant group 44% of the sample households were getting awareness. The chi-square test result in table 6 showed that there is a significant difference among the participant and non-participant, groups in their awareness about the importance of water resource management at 1% probability level. The bivariate correlation analysis also shows that awareness had positive and significant correlation ($r=0.567$, $p=0.000$) with participation in managing drinking water supply. Which mean that provision of awareness to communities will increases participation in managing water source.

Table 5: Education level of the sample household heads

Education level of respondents	Participation in MDWS					
	No		Yes		Total	
	N	%	N	%	N	%
Unable to read and write	32	32	32	32	64	32
Elementary	36	36	32	32	68	34
1-4						
Junior 5-8	20	20	20	20	40	20
High school 9-12	12	12	12	12	24	12
Above 12	0	0	4	4	4	2
Total	100	100	100	100	200	100
χ^2						1.059
P-value						0.920
r						0.036
p						0.803

Source: Own survey, 2017

Participation in training on water resource management: Training plays an important role on increasing community participation of the water resource management and provides knowledge and skill on system of operation and maintains of water supply and prevents major problems regarding utilization of the technology. On the other hand, helps to ensure the sustainability of water supply for the community consumption this is through creation of understanding communities to responsibility to maintaining the resource. Table 7 shows that, 56% of sampled household were participated in training on water resource management provided and 44% of the household had not participated. The chi square test found that there is a significant difference between the participant and non-participants of water resource management at 5% level of probability. Moreover, bivariate correlation result shows the existence of positive and linear relation between participation and training on water source management ($r=0.403$ $p=0.004$). This is due to the fact that, when community became more knowledgeable on an operation and maintenance they will be more eager and willing to participate and ensure the sustainability of the water source.

Table 6: Awareness on managing water resource

Get Awareness	Participation in MDWS					
	No		Yes		Total	
	N	%	N	%	N	%
No	56	56	4	4	60	30
Yes	44	44	96	96	140	70
Total	100	100	100	100	200	100
χ^2						16.095
P-value						0.000**
R						0.567
P						0.000***

***Significant at 5% probability level. Source: Own survey, 2017

Table 7: Sample household participation in training on water resource management

Participation in training	Participation in MDWS					
	No		Yes		Total	
	N	%	N	%	N	%
No	40	71.4	48	33.3	88	44
Yes	16	28.6	96	66.7	112	56
Total	56	100	144	100	200	100
χ^2						5.937
P-value						0.015**
R						0.403
P						0.004***

**Significant at 5% probability level. Source: Own survey, 2017

The study also captured the benefit respondents did get from the training. Accordingly 12 % of respondents' skill improved, while 20% and 18% of respondents reported that enhanced knowledge and economic benefit respectively. The economy of household could be improved through drinking clean water and using

knowledge provided by training concerning managing and utilizing water supply facilities. 50% of respondents did not get any benefit. This is confirmed by discussion with water committee member stated improved health status of family, disclosed relief of women and children from exhausting work, more time for productive, social and domestic activities, household income & health as a benefit gained from access to safe drinking water.

Amount of water consumption in the household: The average household water consumption pattern depends on the family size, the level of income, economic activity, the degree of engagement in productive activity and consumption behavior. The household level economic and productive activity determines the amount of water used per day for the different purposes. The average water consumption of household in the study area was 86.6 liter with standard deviation 30.1 per day per household. When converted to per person for the households having greater than five family sizes this is less than 20 liter the recommended amount should be one person consumed (WHO, 2010). The average water consumption of participants managing drinking water source was 96.8L, while the non participant average water consumption is 76.8L. This implies more consumption of water initiate the households' responsibility of managing water resource than less consumed household. In table 8 the statistical test for variability in mean score using t-test analysis indicates that there was significant mean difference between participant categories at 5% probability level. Bivariate correlation analysis also showed that there was positive and significant relationship ($r=0.338$, $p=0.016$) between amount of water consumption and participation in managing drinking water supply facilities at less than 5% significance level.

Table 8: Daily water consumption of sampled households

Amount of water consumption	Participation in MDWS		
	No	Yes	Total
	N= 100	N = 100	N = 200
Mean	76.8	96.8	86.6
SD	32	23	30.1
χ^2			5.813
P-value			0.020**
R			0.338
P			0.016**

**Significant at 5% probability level. Source: Own survey, 2017

This study also captured perception of respondents to ward availability of water quantity for household consumption. 56% and 38 % of respondent reported the amount of water collected per household per day is fairly adequate and inadequate respectively (Figure 2). Only 6% of respondents were perceived very adequate quantity of water for their own consumption. This reported inadequate quantity of water could be need water for different purpose and may have large family and economic activities that require drinking water. According to the report of respondents water collected from the supply used for cooking, cleaning and drinking purpose.

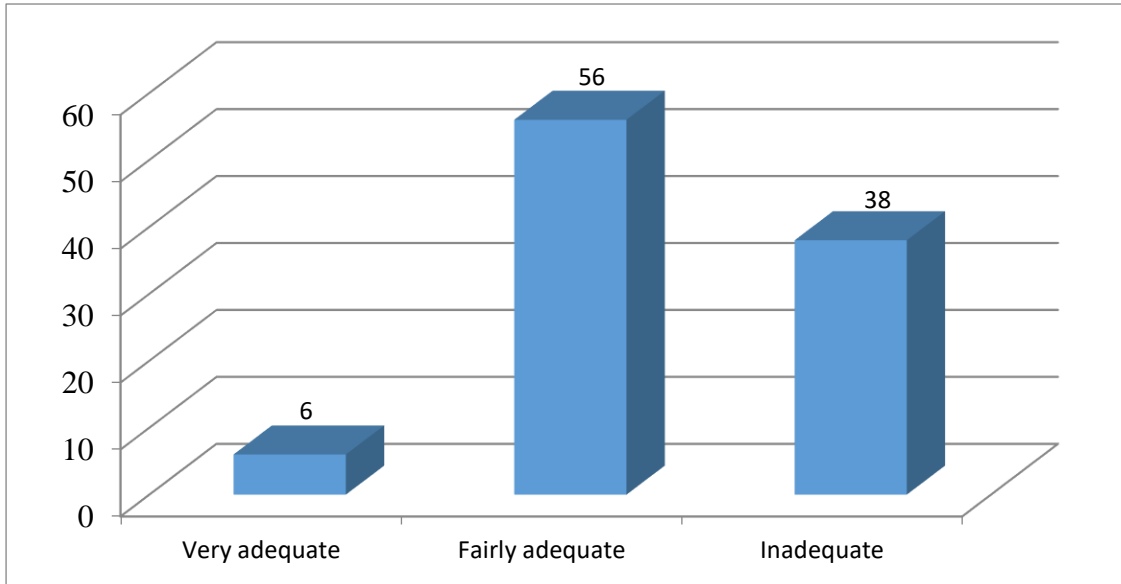


Figure 2: Perception of respondent on quantity of collected water to meet need of household.

On the other hand distance of water scheme from house of respondents was observed. Distance is also another factor to affect participation. The survey results shows around 54% of respondents travel 1-2km to fetch water and 46% of respondents travel 0.5-1.5 km. Distance of water scheme can restrict the household to consume the required quantity of water as it gathered by women and girls force. This directly affects communities' participation in managing water source. In case community perception is a tool for the overall sustainability of services and supply facilities. In other way community satisfaction on quality of service and supply facilities can determine participation in management activity. To prevent such problem respondents were asked on frequency they clean their source of water and the result shows that 68% of respondents reported when it dry and 28% of respondent they clean weakly.

Water committee membership: The existence of a water committee affects overall sustainability of a water system. Water Committee is set to manage system's operation; including carrying out preventive maintenance, collecting tariffs, or payments for repairs, keeping financial records, and sanctioning people for non-payment. For communities, participation and greater control means that services can be developed to fully meet local needs. As shown in table 9, out of total respondent 14% are member of water committee. All of non participants are not found in water committee whereas 28% participants are included in water committee. The result of chi-square indicates that there is a significant difference on to be member of water committee between the participant and non participants of water resource management at 1% level of probability. Moreover, bivariate correlation result shows the existence of positive and linear relation between participation in managing water source and water committee member ($r=0.403$ $p=0.004$). This implies all water committee member participated in managing water source.

Table 9: Water committee member in management of water source

Committee membership	Participation in MDWS		
	No	Yes	Total
	N= 100	N = 100	N = 200
No	100	72	86
Yes	0	28	14
χ^2			8.140
P-value			0.004***
R			0.403
P			0.004**

**Significant at 1% probability level. Source: Own survey, 2017

With this regard, participation of women in water committee the survey found that more than 94% of respondents reported each water committee included women. Most studies revealed that participation of women in the development of water schemes is determinant factor for achieving sustainable use of the scheme. This is because women bear the burden of providing water for family demand and they can promptly notice water quality changes and its consequences.

The level of community participation in managing rural drinking water Supply facilities in the study area: Regarding level of community participation types of contribution were observed. Households can contribute different inputs to the management of drinking water. Cash, labor and materials are an indicator in kind and form of contribution. Accordingly, level of community participation in managing rural drinking water ranged into fair participation, good participation and very good participation. In this case participating only by one form of contribution considered as fair, participating by two form of contribution as good and participating by three or above is received very good participation. Figure 3 shows that, 20% of participants are fair level, 72% of participants are good level and only 8% are very good level participation (Figure 2).

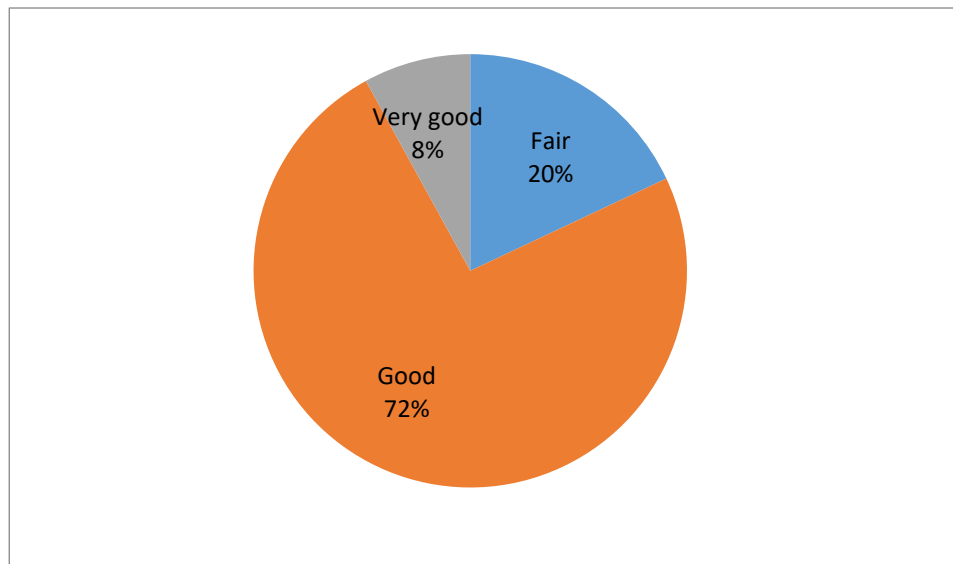


Figure 3: Level of community participation

Type of community participation in managing water source is presented in table 10. Concerning the widely practiced types of community participation labor and materials constitutes 36% of the total respondents. Participation in terms of providing labour, cash and materials has been indicated by 8% of the total respondents. Those respondents who have replied providing cash and labour represent 20%. While 16% of the sample respondents have indicated their participation in terms of providing cash and material. Providing material in the form of community participation has been indicated by 12%. Other category that constitutes 4% of the total responses has stated their participation in terms of cash or labor.

Table 10: Type of community participation in managing water source

Types of Participation	Frequency	Percent
Cash	4	4
Labor	4	4
Materials	12	12
Cash, labor and material	8	8.0
Cash and labor	20	20
Labor and material	36	36
Cash and material	16	16
Total	100	100.0

Source: Own survey, 2018

On the other hand community participation was observed in terms of planning and implementation in the water supply activities. This survey result shows 48 % of respondents were participated in planning and 32% of respondents were participated in implementation of the supply activity.

As conclusions, the well-being of an individual is directly related to water as it affects all the sectors of nature and livelihoods. Inadequate access to clean water consumes time, increase prevalence rates of diseases and increase costs of accessing healthcare. A household is considered to have access to improved water supply if it has sufficient quality and quantity of water for family use at available to household member consumption.

The purpose of this study was to identify factors affecting community participation in drinking water resource management using household cross-sectional survey data from 200 respondents in Nedjo woreda. The households who were involved in the interview were selected randomly and proportionally from two sample villages. Data was analyzed, and presented quantitatively using different descriptive statistical methods such as percentage, and mean using tables and different graphs. Chi-square test and t-test was used to see the significance difference between participants and non-participants. Moreover, bivariate correlation tests also indicated that the direction and strength of association between the hypothesized explanatory variables with participation in managing drinking water source.

In the study areas, factors of participation of communities in managing drinking water supply are identified. The finding shows that sex of household head, family size, awareness on importance of water source management, participating in water source management training, amount of water consumption and be member of water committee had significantly influenced the decision to participate in water resource management. According to chi-square test being male headed, training participation and getting awareness correlated with participation in water source management. It was also observed that family size and amount of water consumption per household per day are significantly related to participation. Involvement in water committee is also observed to affect household level of participation in water resource management.

As recommendations, community participation in water resource management is an important issue to ensure sustainable use of water supply resources. The results of this study have shown that different factors are influencing community decision to participate in water resource management in the study area. Based on the main findings of the study, the following recommendations are forwarded:

Gender is found to significantly affecting community participation in the study area. Male is more participating in the activity than women. Considering importance of women participation, women should involve in water source management activities. Thus, empowerment of them would play a leading role in sustainability of water source.

Training and awareness on water source management is an important factor to decision of community participation. The community should be adequately participated in management of water supply activities. This can be achieved through provision of training and awareness on the issues. Thus the study further recommend there should be regular training and awareness creation methods on water management issues and technical skills. The policy should promote objective oriented training with special emphasis on community participation, administration, operation and maintenance.

Amount of water household consumed per day that is restricted by distance of water source from house of respondents is the other important factor that needs consideration. This implies requirement of water supply near to households. Thus stakeholder and community should decide on the issue to benefit the society in the study area.

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