

Assessment of Community Led Total Sanitation Achievements and Its Associated Factors in Rural Kebeles of Adama Woreda, East Shoa Zone, Oromia, Ethiopia

Teshome Ergena Tuli^{1,*}, Asfaw Ergena Tuli², Worku Dugasa Girsha³

¹Department of Public Health, Adama General Hospital and Medical College, Adama, Ethiopia

²Department of Agricultural Service and Value Chain, Ambo University, Ambo, Ethiopia

³Department of Public Health, Adama Hospital Medical College, Adama, Ethiopia

Email address:

teshomeergena34@gmail.com (T. E. Tuli), ergenase@yahoo.com (A. E. Tuli), dugassaworku@gmail.com (W. D. Girsha)

*Corresponding author

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Abstract: Ethiopia has made important improvement concerning entire water, sanitation and hygiene access in the past era on the other hand still significant problems present which varies from rural to urban. Due to limited access to safe water, inadequate sanitation and hygiene services, 60-80% preventable communicable diseases attributed in the country. For controlling, community led total sanitation program introduced in 2013. This is aimed to assess community led total sanitation achievements and its associated factors in rural kebeles. A cross-sectional study with cluster, probability proportion and simple random sampling techniques employed to collect data from 604 households. Data were collected through interview and observational checklist. The study revealed that, only 51(8.6%) respondents answered community led total sanitation achieved. Sex (AOR=4.72, 95% CI =1.09-8.48, p=0.01), monthly income (AOR=2.00, 95% CI=1.09-3.69, p=0.03), open dump in the yard (AOR=2.03, 95% CI = 1.11-3.72, p=0.005) and triggering step (AOR=3.54, 95% CI = 1.41-8.89, p=0.003) significantly allied to community led total sanitation achievement. This finding concluded that, community led total sanitation achievement in the study areas were very lower than the areas posted open defecation free. Health workers, community representatives and local authorities must give special emphasis to improve the coverage.

Keywords: Community Led Total Sanitation Achievement, Latrine Utilization, Hand Washing Practices, Access Safe Water Supply

1. Introduction

According to WHO/UNICEF-joint monitoring program updated in 2012, sanitation is common for many international organizations to use access to hygienic sanitation facilities as a measure of progress in the fight against poverty, disease, and death [1]. Globally, still one in three (2.4 billion) people without improved sanitation, including one in eight (946 million) people practicing open defecation. Regarding the rural parts, still seven in ten people lack improved sanitation facilities and nine out of ten (90%) people practicing open defecation [2].

Healthy epidemiological studies by Esrey displayed, sanitation is one of the biggest development challenges in most of developing countries. Pit latrines, when properly used can reduce diarrhea by 36% or more, cholera by 66%, and worm infestations by between 12 to 86% [3]. A cross-sectional study conducted in 2013 on the impact of the Indian total sanitation campaign on latrine coverage and use showed that over a third (37%) of the members of households with latrines never defecating in their latrines [4] and also the same study method in rural India at 2015 resulted, improved conditions of sanitation and hygiene practices are associated with reducing prevalence of stunting [5].

Community led total sanitation provides techniques of

unites the community to commit to using sanitary latrines and hygienic behavior, and understands that the process is a shift towards a zero subsidy approach rather than providing them with money to construct latrine [6]. In Africa, community led total sanitation has various benefits in comparison with the traditional subsidy led approach in case of identifying natural leaders who support the design and construction of subsidy free latrines and providing awareness for community about methods of disease transmission due to lack of proper sanitation and means of reduction [7]. In sub-Saharan Africa, majority of the countries not achieved open defecation free due to country's economic and only 30% of the rural population of sub-Saharan African countries was using improved sanitation facilities by 2015 [8, 9].

Ethiopia like many other countries in Sub-Saharan Africa has low levels of WASH facilities and practices. Only 4% of households use improved toilet facilities that are not shared with other households (14% in urban and 2% rural areas) whereas the rests (57% in rural and 43% urban areas) use non-improved toilet facility that means an open pit latrine or pit latrine without slabs and only 29% (28.3 million) declined open defecation [2, 10].

A study conducted in Southern nation nationality and people region of Ethiopia revealed that the number of household latrine coverage, in few years, grew from 16% to 94% in Mirab Abaya and 10% to 69% in Alaba [11] as well as open defecation free villages are also being promoted to improve the utilization of latrines in the region [12]. 41.6% of the households living in rural of Bahir Dar Zuria district lacked pit latrines [13] and 86.8% of households use latrine in Dembiaworeda, according to study conducted in 2013 [14].

Household's income is associated to availability of improved of sanitation facilities, which were households that had a higher income, have improved of sanitation facilities than lower incomes according to finding result in rural communities of Lemo Woreda, Hadiya Zone, Southern Ethiopia in 2014 [15]. Provision of adequate sanitation facilities is not only a socioeconomic and developmental issue, but also an issue of self-respect, human dignity and public health [16]. A large proportion of Abomsa town residents have a latrine (89%), only 36% households have an improved facility (e.g. with slab) and a substantial minority of households (10%) still rely upon open defecation. In rural areas, fewer households have latrines (41%) but far fewer are improved (2%) and the majority practice open defecation [17].

Regarding water supply, it is associated with a 15% reduction of diarrhea and a combined safe water supply, sanitation and hygiene can reduce diarrhea by 65 [3]. In Ethiopia, only 16% (piped and a protected well) and 12% of a protected spring were in rural households [18] and 53% households travel 30 minutes or more to fetch their drinking water (19% in urban and 62% rural areas) [19]. The study on access to safe drinking water and availability of environmental sanitation facilities among Dukem town households in 2013 pointed that almost all the households

had access to improved water supply and quite large of them are unimproved toilet facility [20]. and another an assessment of urban water supply and sanitation in Ambo town, Oromia Region on March 2011, indicated that water and sanitation inaccessibility has a great deal to health, socioeconomic and environmental impacts [21].

Hand hygiene is the most simplest and effective measure to prevent infections and account 50% of health care associated infection due to hand of health care providers [18]. Studies on hand washing frequency, motivators and barriers have primarily been performed in stable developing country contexts. Curtis *et al.* performed an eleven country study and found in structured observations that 17% of care givers washed hands with soap after defecation, while 45% rinsed hands with water alone [22]. Hand washing with soap is more effective at hand decontamination than washing with water alone [23]. After contact with stools hand washing with soap and water can reduce diarrheal disease by 35% [3]. A study in three refugee camps by Biran *et al.* (in Kenya, Ethiopia and Thailand) found that soap was used for hand washing 20% after of toilet use events due to lack of free soap and preference to use soap for washing [24].

The study conducted in Denbia district among people living in rural areas in 2013 pointed hand washing practice after latrine with access to all essential supplies were very low (26.9%) and the presence of ≤ 5 years children, job of mother farmer and rare cleaning of latrine were factors negatively associated as well as the educational status of mothers, presence of secondary school student, the presence of the door, frequency of latrine construction and hygienic condition of latrine were positively associated with latrine utilization [14]. Another study in Kersaworeda by 2010 showed 8.3% respondent's practices hand washing after visited latrine [25].

Community led total sanitation program introduced to Ethiopia in 2006 which used as an entry point strategy [26]. Accordingly Adama district health report updated 2016, community led total sanitation achieved in ten rural kebeles and posted end open defecation [27].

The identifying of status of community led total sanitation achievement and its associated factors in the study areas will facilitate better understanding of the problems and influence organizations and decision making at all levels from communities to national levels. Therefore, this study was assessed community led total sanitation achievement and identified its associated factors in rural kebeles of Adama district.

2. Methods and Materials

2.1. Study Design and Setting

A community based cross-sectional study design with both descriptive and analytical components was used to assess community led total sanitation achievement and its' associated factors. The study was carried out in five rural kebeles of Adama district which far 99 km in the eastern

of Addis Ababa, Ethiopia. The study population was all households in the selected rural kebeles of Adama woreda. The study units were randomly selected households from each cluster in five selected rural kebeles of Adama woreda. The study was carried out from February to August, 2016.

2.2. Sampling Methods

A total of 37 rural kebeles started community led total sanitation program, only 10 kebeles were graduated open defecation free in the study areas. Of 10 kebeles, five were selected by simple random sampling (lottery method) and the sample size was distributed proportionally to each of them based on the number of households they have. The five rural kebeles were more clustered in to 'gares' and proportional allocations of sample were assigned to the respective 'gares'. The five kebeles have 68 'gares' with average 1,700 households which mean each 'gare' has 20 up to 30 on average 25 households. I was assigned 604 households sample size proportionally to five kebeles which reached almost 25 households per clusters and the left 8 households were distributed by simple random sampling system.

2.3. Sample Size Determination

The sample size was determined using a single population proportion formula.

$$n = Z_{\alpha/2}^2 p (1-p) / d^2 \quad (1)$$

Where

- a. n = Sample size of households.
- b. P = Proportion of households ended open defecation free or achieved community led total sanitation. No previous similar study was carried out in the area. So, to get maximum sample size, P was taken as 50% (P=0.5).
- c. d = Degree of accuracy required (sampling error) is 5% that is, d = 0.05.
- d. Z = Standard score for 95% confidence level is 1.96.
- e. Additional 5% for non-response rates and design effect 1.5 were taken.

Substituting the above values (1), the calculated sample size for the study was 605 households.

2.4. Inclusion and Exclusion Criteria

Inclusion sampling criteria for this study was households living in the selected rural kebeles for greater than six months before the study begin and volunteer to participate in the study. Exclusion criteria for this study were individuals who reside in the selected kebeles for less than six months and who did not volunteer to participate in the study. The other exclusion sampling criteria were institutions such as offices, hotels, super markets and etc.

2.5. Ethical Considerations

Ethical approval and clearance was obtained from the

Institutional Review Board of Oromia Health Bureau after Adama General Hospital and Medical College wrote official letter. Formal letter of cooperation was written for Adama district Health Office. Consent of district health office and respective kebeles were obtained. Informed consent was obtained from each study subject. Any involvement in the study was carried out with the full consent of the person being interviewed. Finally after collection of the necessary data, identified problems during an evaluation process were discussed with health office so as to improve community led total sanitation achievement in the district.

2.6. Data Collection Techniques

Data were collected using structured, pretested and face to face interviewer-administered questionnaires through house to house. Questionnaires were translated in to local languages (Afan Oromo) based on the data collectors and study area of the communities understands. Pre-testing of the instrument was done in order to identify the clarity of questions. Five percent of the questionnaires (sample size) were carried out in a rural kebele of Boset Woreda which is near and similar to study area before the real data collection start. Discussion was held with the interviewers and households on the problems they encountered to collect data during the pre-testing. Correction was incorporated in the final questionnaire. Training was given for seven health extension workers who were recruited as data collectors and two health professionals who were employed as the supervisor for one day before the pretest and for a day after the pretest. The training includes the objectives of the study, method of data collection, how to check completeness of questionnaire and the way approaching to the households.

2.7. Data Processing and Analysis

After the collected data was compiled, organized, coded, summarized, entered using computer software EPI version 7 and exported to SPSS version 20. The data analyzed using bivariate and multivariate logistic regression to determine the effect of various factors on the outcome variable. The degree of association between independent and dependent variables were assessed using adjusted odds ratio with 95% confidence interval and p-value ≤ 0.05 .

3. Results

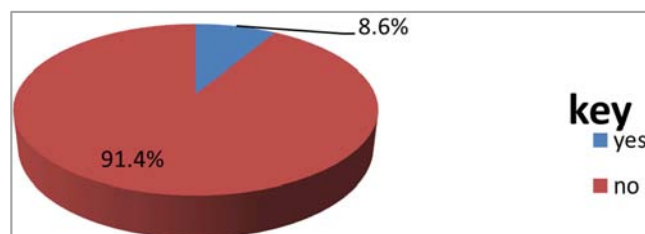
This study was done in five open defecation free posted rural kebeles of Adama district of East Shoa zone, Oromia region. A total of 605 households, 594 (98.3%) of a response rate of this 377(63.5%) females and 217(36.5%) males were included in this study. Among these 410 (69%) were age greater than 50 years. Majority of respondents, 534 (89.9%) Oromo by ethnicity, 430(72.4%) orthodox in religious and 300 (50.51%) were house wives in occupation.

Table 1. Socio-demographic characteristics in rural kebeles of Adama district, East Shoa Zone, Oromia Region, Ethiopia, August, 2016. (n=594).

Variables		Frequency	Percent
Age	20-29	81	13.64
	30-39	224	37.71
	40-49	131	22.05
	50-59	75	12.63
	≥ 60	83	13.97
Sex	Male	217	36.5
	Female	377	63.5
Ethnicity	Oromo	534	89.9
	Amhara	45	7.6
	Others ^a	15	2.5
Religion	Muslim	38	6.4
	Orthodox	430	72.4
	Protestant	98	16.5
Educational	Other ^b	28	4.7
	Illiterate	188	31.6
	Read and write	116	19.5
	Grade 1-4	137	23.1
	Grade 5-8	126	21.2
	Grade 9-12	24	4
	Certificate/diploma	3	0.5
	House wife	300	50.51
Occupation	Merchant	9	1.52
	Employee	2	0.34
	Daily laborer	37	6.22
	Other ^c	246	41.41
Monthly income	<150birr	399	67.2
	≥150birr	195	32.8
Family size	≤ 5	399	67.17
	> 5	195	32.83

Note: (Gurage, silte and Woliyita^a), (wakefata and Kalicha^b), farmers ^c

Among total study, only 51(8.6%) of the respondents answered that community led total sanitation was achieved.

**Figure 1.** Community led total sanitation achievements among interviewed households in rural kebeles of Adama district (n=594), July, 2016.

Out of the 370 (62.3%) households who have latrines, only 69 (11.6%) improved latrines (pit latrine with slabs) which were used only by family members. Majority of (92.7%) the respondents have their own latrines and 47 (68.1%) use improved latrines.

Table 2. Percent distribution of household's utilizing improved latrine in rural kebeles of Adama district, East Shoa Zone, Oromia Region, Ethiopia, August, 2016. (n=594).

Variables	Frequency	Percent
Availability of latrine		
Pit with slab (improved)	69	11.6
Pit without slab (Non improved)	301	50.7
The owner of the latrine		
Private	343	92.7

Variables	Frequency	Percent
Communal	27	7.3
The reason not having latrine		
Lack of space	21	9.4
High cost	105	46.9
Create bad smell	31	13.8
Attracts flies, rats and insects	64	28.6
Not needed by households	3	1.3
Latrine facility household usually use		
Non improved latrine (pit latrine without slab)	229	76.1
Improved latrine (Open pit with slab)	47	68.1
The main benefit of latrine		
For privacy	75	20.3
For satisfaction	33	8.9
For prevention of diseases	203	54.9
For dignity	49	13.2
For clean environment from human faeces	10	2.7

According to this finding result, 216 (58.38%) have hand washing facilities. Also from those households have hand washing facilities, 178 (30%) washed their hands after using the toilet with soap and water. Among washed their hands after visited latrines, majority 487 (82%) washed their hands sometimes whereas the rest always.

Table3. Percent distribution of households' hand washing practice after utilization of latrine among study respondents in rural kebeles of Adama district, East Shoa Zone, Oromia Region, Ethiopia, August, 2016. (N=594).

Variables	Frequency	Percent
Hand washing practice		
After using latrine	178	30
Before preparing food	263	44.3
Before preparing food	559	94.1
After work and shaking people	302	50.8
How often wash your hand		
Always	102	17.2
Sometimes	492	82.8

Of the respondents 568 (95.6%), 18(3%) and 8 (1.2%) were used public stands, protected dug wells and unprotected sources (rivers, ponds, dams and unprotected wells) respectively. 584 (98.3%), of the households fetched water outside their housing compounds, of these 549 (92.4%) travel greater than or equal to 30 minutes to fetch water (please see table 4 below).

Table 4. Households access to improved water supply among interviewed households in rural kebeles of Adama district (n=594), August, 2016.

Variables	Frequency	Percent
Source of drinking water		
Public stands	568	95.6
Dug well protected	18	3
Unprotected dug well	8	1.2
Households fetched water		
Outside their housing compounds	584	98.3
Inside their housing compounds	10	1.7
Taking time to fetch water (go and come back)		
< 30 minute	35	7.6
≥ 30 minutes	549	92.4
Problems do you face in relation to water		
Scarcity/absences	490	62.5
Water borne diseases	215	36.2
Expensive payment	90	15.2
Distance from their home to water sources	372	62.6

Of the respondents replied on community led total sanitation achieved 51(8.6%), only 27(52.9%) revealed that

they recognized step of community led total sanitation (triggering).

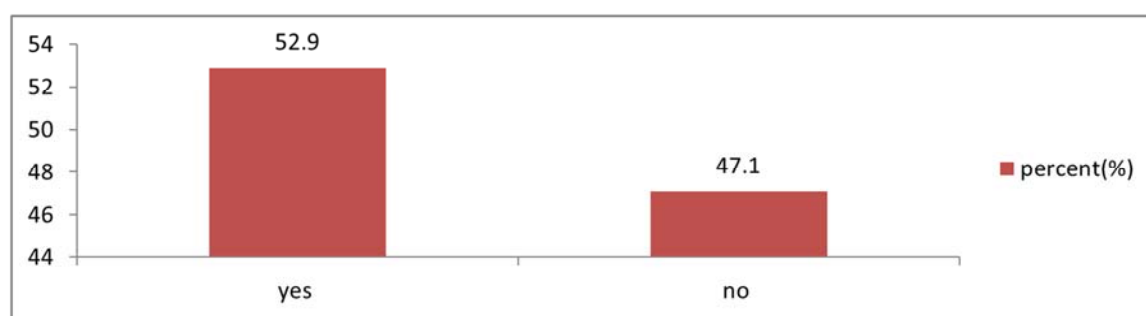


Figure 2. These Knew and participated on triggering step among interviewed households in rural kebeles of Adama district (n=594), August, 2016.

Table 5 below indicates factors like sex of the respondents, monthly income of the respondents, not open dumped in yard and not knew steps of community led total sanitation were associated with community led total sanitation achievement after Bivariate analysis was carried out to examine the associated factors for community led total sanitation achievements at the household level. Many variables were explored to test association of community led total sanitation achievements like sex of the respondents, monthly incomes of respondents and households attended in steps of community led total sanitation achievements like waste disposal systems

(open dump in yard), triggering and community conversation statistically have significant association.

Adjustment of variables using multivariate logistic regression was carried out to predict community led total sanitation achievements variables; sex of the respondents (AOR = 4.72, 95% CI = 1.09 - 20.48, monthly income of the respondents (AOR = 2.00, 95% CI = 1.09 - 3.69), not open dumped in yard (AOR = 2.03, 95% CI = 1.11- 3.72) and not knew triggering step (AOR = 3.54, 95% CI = 1.41- 8.89) were significantly associated with community led total sanitation achievements.

Table 5. Analysis on associated factors with community led total sanitation achievements among the respondents in rural kebeles of Adama district, August, 2016. (n=594).

Variables	CLTS achievement		COR (95% CI)	AOR (95% CI)
	Yes	No		
Sex of the respondents				
Male	18(8.3%)	199(91.7%)	1	1
Female	33 (8.8%)	344 (91.2%)	2.28 (1.28 - 4.07)	4.72(1.09 - 20.48)*
Households in triggering step of community led total sanitation achievement				
Knew and participated	27 (33.3%)	54 (66.7%)	1	1
Not Knew and participated	24 (4.7%)	489 (95.3%)	2.11(1.06 - 4.23)	3.54 (1.41- 8.89)**
Waste disposal in open dump of yard				
Yes	22(6.3%)	326 (93.7%)	1	1
No	29(11.8)	217 (88.2%)	2.37(1.31 – 4.26)	2.03 (1.11- 3.72)**
Community conversation				
Yes	10 (3.5%)	278 (96.5%)	1	1
No	41 (13.4%)	265 (86.6%)	1.58(0.88 -2.83)	0.28(0.09 -1.66)
Monthly income in birr of households head				
≥ 150	15 (7.7%)	185 (92.3%)	1	1
<150	36(9%)	363 (91%)	2.30 (1.29 – 4.10)	2.00 (1.09 – 3.69)*

Note: Significant at (*P<.05; **P<0.01; ***P<0.001), AOR: Adjusted Odds Ratio, COR: Crude Odds Ratio, CI= confidence interval.

4. Discussion

This study revealed that majority (62.3%) of the households had access to latrine. This is slightly greater by 3.9% than the study conducted (58.4%) in Bahirdar Zuria district of North Ethiopia in 2013 [13] whereas less by 31.7% and 6.7% than the study shown in SNNP region of Ethiopia at Mirab Abaya (94%) and Alaba (69%) respectively [11]. The study conducted at North Ethiopia of Denbia district displayed (86.8%) greater [14] by 24.5% than this recent finding. The current study result (11.6%) on improved latrines (pit latrine with slabs) coverage is higher via 9.6%

than the Ethiopia mini demographic health survey conducted (2%) in rural areas in 2014. These differences may be due to available locally materials for latrine construction, continuous training, support and follow up of health extension professionals.

Joint monitoring program for water supply and sanitation by WHO and UNICEF in 2015 identified protected well and public tap/stand pipes are improved water sources among others [2]. Accordingly this study, 3% used protected dug wells which is less than by 13% revealed in study conducted (16% used protected dug well) on microbiological evaluation of the efficacy of soapy water to clean hands in 2014 [18]. This may be due to geographic, lack of awareness toward use

of improved water sources and lack of access improved water supply sources.

Regarding time to fetch water from sources, majority (92.4%) of households answered that it takes greater than 30 minutes. In rural areas studied done by Ethiopia Demographic and Health Survey 2011, shows 62% [19] and according to WHO guideline recommends less than 30 minutes [1]. This finding shows greater than by 30.4% study result done by Ethiopia Demographic and Health Survey 2011. The reason could be due to scarcity or inadequate water (82.5%) and distance between water source and their houses 62.6% as the proportion of this research shows, others may be quality of water accessed to them and scatter of houses among each other's.

With reference to hand washing facilities, more than half of the respondents (58.38%) have hand washing facilities according to this finding. This finding higher almost by 3.4, 2.2 and 9.4 times than study conducted in an eleven country study and found in structured observations that 17% of care givers washed hands with soap after defecation [22], Denbia (26.9%) [14] and Bahar Dar Zuria (6.2%) [13] Districts respectively. The study showed only 30% of the households with latrines washed their hands with soap/ash and water after defecation. It is higher via 21.8% and 13% than the study conducted in kersa district (8.2%) [25] and eleven countries (17%) respectively [22]. This difference may be due to the fact that recently there has been high mobilization of the community on hygiene and sanitation which increases hand washing facility coverage of the study area.

This study shown that, among 594 interviewed households on community led total sanitation achievement, majority (91.4%) of the respondents replied it was not achieved. This finding result showed that 1.4 higher than the proportion of the population practicing open defecation which was documented by Joint Monitoring Program of WHO and UNICEF at Geneva, Switzerland (90%) (2015) [2] and 32.4 times higher than 59% of the one WASH Plus program by the Government of Ethiopia and UNICEF in rural kebeles Abomsa town (2014) [17]. Of this this finding, 513 (86.4%) shown that they did not know its step (triggering) of implementation. In this resulted, most of population practicing open defecation. This may be due to community led total sanitation steps was not well implemented, lack of community mobilization, no bylaws, less community conversation on community led total sanitation, low support and follow from health extension workers.

Based on the result of multivariate analysis from socio-demographic respondents have less income (<150 birr) can decrease community led total sanitation achievement by two times than households with monthly income greater or equal birr 150 per month. This may be due households got greater or equal birr 150 per month have ability to achieve community led total sanitation than these lower incomes. Female's households head can increase community led total sanitation achievement by 4.72 times than males according this finding. This might be due to females have a higher responsibility in their households than females. Regarding to

households not know and attended on triggering 3.54 times decreasing than these know and attended. It may be due to these got adequate awareness on step (triggering) of community led total sanitation can increase achievement. Households not disposed wastes in yard increase by 2.03 times than these disposal wastes in yard the achievement of community led total sanitation. This may due to the dispose in open sites.

5. Limitation of the Study

The households that were included in the study were from only one rural district (Adama) and other rural districts in oromia were not incorporated in this study. Research results therefore are limited to this particular rural district and cannot be generalized to other districts in Oromia.

6. Conclusion and Recommendations

This study revealed that most of the household's the latrine coverage was low (62.3%) of this only 11.6% household have and used improved latrines whereas the study have only 30%hand washing practices after utilizing latrines. Regarding to access to water supply in the study area, majority (92.4%) of the households were moved more than or equal to 30 minutes for fetching water from sources which was greater than the WHO guidelines.

Community led total sanitation achievement in the five selected open defecation free kebeles was 8.6%. This result showed indirectly that 91.4% of community led total sanitation not achieved in the study areas which was higher. Therefore, based on this finding, I concluded that generally community led total sanitation achievement in the study areas were very lower than the Adama woreda health office annually updated (2105) report (100% verified end of open defecation), World Health Organization and United Nation Children Funds updated report in 2015. Regarding latrine utilization, hand washing practice after utilizing latrines and access to improved water supply were very lower than what was being reported by Adama woreda health office 2015) which was 100% of latrine coverage as well as utilizations, hand washing practices after visiting latrines and access of improved water supply less than 30 minutes. Therefore, this study recommends the following actions in order to alleviate the problems:

- a. Additional improved water supply sources should be provided to supply adequate and continues water to the community.
- b. Increasing community based health education on hand washing practices after defecation is essential by strengthening health extension workers.
- c. Increasing awareness and practices of safe solid waste disposal methods by the households and preparation of solid waste disposal site by the town municipal.
- d. Re implement community led total sanitation following its steps and continues follow-up, support, mobilize and supervision by all stakeholders.
- e. Further research is needed

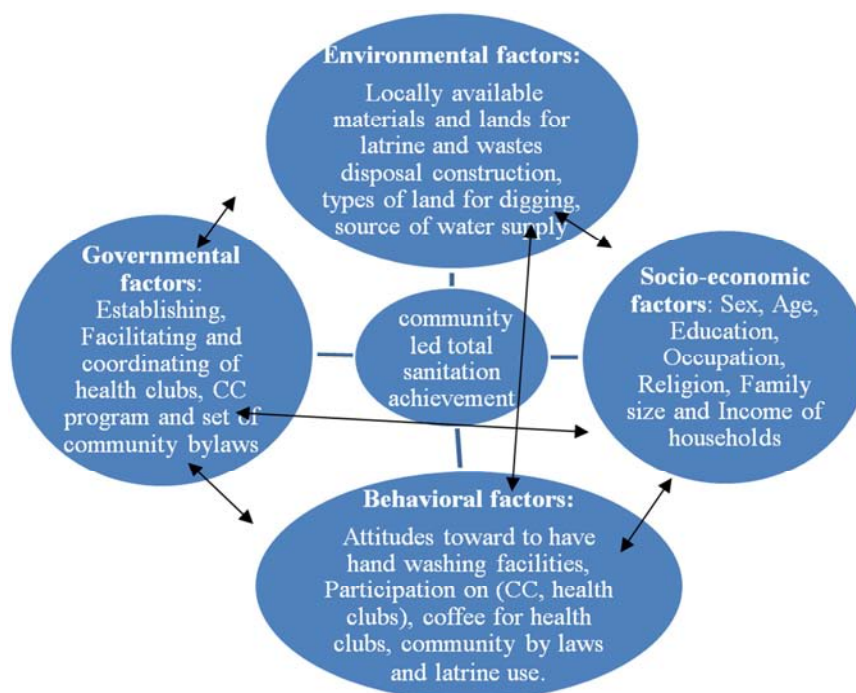


Figure 3. Conceptual frame work of community led total sanitation achievement and its associated factors in five open defecation free rural kebeles of Adama district, East Shoa Zone, Oromia Region, Ethiopia, August, 2016. (n=594).

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