

**ASSESSING COMMUNITY PARTICIPATION IN WATER
PROJECTS IN PERI-URBAN AREAS OF DODOMA
REGION, TANZANIA**

FADHILI H. MGUMIA*

FATUMA K. DAUDI**

P. A. KOPOKA***

ABSTRACT

The study was carried out to investigate community participation in water projects in peri-urban areas of Dodoma Region, Tanzania. Data were collected through household questionnaire survey, focus group discussion and key informants. One hundred and twenty six households were interviewed. Results of the study showed that different forms of participation tend to vary with different stages of water project, ranging from attending meetings to contribution in cash and labour. Community participation faced with a number of challenges in water projects including frequent breakdown of infrastructure. Furthermore, the study recorded low to moderate level of community involvement in water project, and level of participation tends to be higher in advanced stage of projects. It is recommended that emphases be given on involvement of all stakeholders from the onset of the water projects; more and continuous training related to water project management should be provided to the community, and local government and Municipality should design mechanism to enhance and supporting O & M for the sustainability of water projects.

Key words: water projects; forms of community participation; planning, implementation

* **Institute of Rural Development Planning (IRDP), Dodoma, Tanzania**

** **Dodoma Municipal Council, P. O. Box 1249, Dodoma, Tanzania**

*** **University of Dodoma, Dodoma, Tanzania**

Introduction

Water is the source of life and of extreme importance for development. However, water shortage and inaccessibility are becoming global issues of concern due to increasing population, economic growth and climate change (PAI, 1997). Accessibility of improved water supplies is generally lower in rural Sub-Saharan Africa than in any other region, as almost half of population depend on unprotected sources such as traditional wells and rivers for their domestic needs (Joint Monitoring Programme, 2012). It is estimated that by 2025 more than 2.8 billion people in 48 countries will lack access to adequate water supplies (Ahmed et al., 2014). According to Weiskel et al. (2007) and URT (2014) low access to improved water supplies in this region is attributed by many reasons among them are poor sustainability of water infrastructure, limited institutional capacity, poor community participation, inappropriate system design and poor management of water resources.

In an attempt to address challenges related to water services provision and sustainability of rural water infrastructure, planners and water practitioners have emphasized the shift from a centralized, top down approach toward bottom up approach (Briscoe and Ferranti, 1988; Garn. 1997) which emphasizes on community participation in the planning, construction and operation and maintenance (O&M) of water projects (Davis et al., 2008). This shift was a result of assessments done by the International Drinking Water Supply and Sanitation Decade (1981–1990) which criticized top down approach for the poor performance in infrastructure installed during the decade (Therkildsen, 1988). By contrast, bottom up approach theoretically targets communities that truly want and need water supply improvements, requires water users' participation throughout planning and implementation, and vests them with key decisions about the project.

Tanzania, like other countries, initiated active participation of communities, private sectors and local governments in water sector, while the role of central government in services provision diminishes (URT, 2014). This was in line with establishment of Water Sector Development Programme (WSDP) with the immediate aim to increase access to clean and safe drinking water to at least 90 per cent of urban dwellers and 65 per cent for rural dwellers. The government believes that through decentralization, citizens, politician and policy makers will be more

responsible, accountable as well as build the sense of local people ownership regarding different project introduced in their areas, consequently project's sustainability.

Apart from all the good initiatives of WSDP, Tanzania like many other poor nations, still people suffers from serious lack of clean and safe water. To date only 51 % of rural and 80% of urban have access to clear and safe water (URT, 2014). Limited community participation in the implementation and management of projects has been one of the reasons for poor water project sustainability (URT, 2014). Lack of reliable data on effective community participation in development projects constitutes a major constraint to rural development practitioners, hence, making it difficult for governments and development agencies to properly measure progress achieved by development projects in improving livelihoods of rural communities (FAO, 1991; Karki, 2001). For example, few studies have so far been done in Africa on people's participation in water projects in terms of how water projects were initiated in a community, their ability to make informed choice and their level of contribution to the projects (Sara and Katz, 1998). In addition, forms of community participation which is equally important for water project performance and sustainability is also generally lacking (Marks et al., 2014). While there are some studies conducted in Tanzania (see Masanyiwa, 2014a;b; Mandara, 2014), information on forms of community participation and level of community participation in water projects by communities is not well documented, and particularly in semi arid rural-urban areas of Dodoma. This paper therefore intends to investigate community participation in water project in terms of breadth of community participation (as measured by the percentages of households that participated in a particular activity) and depth of community participation (as measured by the typical household's extent of engagement).

Materials and Methods

Study Area

The study was conducted in Dodoma Municipal, Tanzania between October and December 2015. The Municipality lies between Latitudes 6.00° and 6.30° South, and Longitude 35.30° and 36.02° East. It is characterized with both Urban and rural qualities. The climate of Dodoma is semi-arid, characterized by a marked seasonal rainfall distribution with a long dry season. Average rainfall ranges from 550 to 600mm per annum, while minimum average temperatures vary from

20°C in July to 30°C in November (MDC, 2014). The current population of Dodoma Municipality is 4 410 956, with total number of households of 76 112, and an average population growth rate of 2.4%. About 70% of the rural population have access to unclean and unsafe water (MDC, 2014). Dodoma Municipality is administratively divided into 4 divisions, 37 wards, 39 villages, 100 streets and 222 hamlets. The study was conducted at Mkonze ward, located about 10 km from Dodoma Municipality on main road to Iringa Region.

Data collection methods and statistical analysis

Both qualitative and quantitative data were collected by using several methods (mixed methods) in order to have a deeper insight of community participation in water projects. Out of 37 wards, one ward, Mkonze was selected randomly. A total of 126 respondents were selected among 4683 households, of which makes a 2.7% sample size intensity. The household questionnaire was administered to randomly selected head of households. Key informant's interview was conducted to people who were knowledgeable and involved in water projects including leaders at village, ward and Municipal levels. Lastly, focus group discussion was conducted with average number of 10 members. The combination of methods helped in cross checking reliability and validation of information collected from other methods (Creswell, 2003; Axinn and Pearce, 2006). Descriptive statistical analysis was used to explore the data for distribution of response, central tendencies and dispersion. Inferential statistical analysis was employed in order to detect whether responses differ significantly between or among respondents; Chi square test was employed at 5% level of significant. In addition, content analysis was used to analyse qualitative data collected through Focus Group Discussion and key informant interview. Statistical Package for Social Sciences (SPSS) programme version 16 performed analysis.

Results and Discussion

Socio economic characteristics of respondents and water system

Table 1 shows that majority of respondents (59.5%) were male. Most of the respondents (38.9%) were in the age ranges between 31 and 45 years, implied a young aged group with required energy to take up developmental projects. Overwhelm number of respondents (91.3%) were married implied that most of them were responsible households and therefore involved in development projects.

Table 1: Socio economic characteristics of the respondents and water system (n = 126)

Variables	Operationalisation	Frequency	Percentage
Gender	Male	75	59.5
	Female	51	40.5
Age	19 – 30	32	25.4
	31 – 45	49	38.9
	46 – 60	35	27.8
	60 and above	10	7.9
Marital Status	Married	115	91.3
	Single	9	7.2
	Divorced	2	1.6
Level of Education	No formal Education	18	14.3
	Primary	101	80.2
	Secondary	3	2.4
	Tertiary	4	3.2
Household size	0 – 5	65	51.6
	6 – 10	58	46.0
	11 - 15	3	2.4
Occupation	Farming	83	65.9
	Livestock keepers	1	0.8
	Civil Servants	6	4.8
	Trading	32	25.4
	Others	4	3.2
Water as problem	Major problem	16	12.7
	Problem	3	2.4
	Not a problem	106	84.9
Types of water projects	Deep borehole	110	87.3
	Water mindmills	29	23.0
	Water barriers	16	12.7
	Traditional dam and wells	2	2.6

As for level of education, majority (80.2%) had attained primary education followed by no formal education (14.3%) suggested that generally most people had basic literacy. Majority of respondents (51.6%) had family size less than 5 members, while minority (2.4%) had family size ranges between 11 and 15 with average household size of 5.7. The reported family size is comparable to average national household size of 4.8 by 2012. In terms of occupation, majority were farming peasants (65.9%), followed by petty traders (25.4%).

Majority of respondents (84.9%) perceived shortage of water as a major problem in their areas with a means score of 2.7. Availability and access of clean and safe water is one of the major problems in most developing countries (UNEP, 2010). In Tanzania almost 54% of rural dwellers do not have access to safe and clean water (URT, 2014). As a result several donors had initiated water projects in order to improve access of water to rural communities (Table 1). There were about three deep borehole water projects, one water wind mills, three water barriers, one traditional dam and several traditional wells. Borehole has been a common water project established by donors in order to improve access of water to rural communities (Magut et al., 2014; Masanyiwa, 2014a;b; Mandara, 2014; Oloruntade et al., 2014). It is estimated that almost 75% of rural dwellers are served by borehole worldwide (Auckhinleck, 2013).

Forms of community participation in water projects by stages of the project

Community participation in planning stage

A significant number of respondents (52.1%) agreed to be involved in meetings related to initiation of water projects ($\chi^2 = 52.628$; $p = 0.0001$) (Table 2).

Table 2: Forms of community participation in the planning stage: attending meetings

Variables	Freq/%	χ^2 value	p value
Participation in meetings for water projects			
initiation			
Participated	63 ¹ (52.1 ²)		
Not participated	55 (45.5)	52.628	0.0001
Don't Know	3 (2.5)		

How many meetings you have attended

Not attended	1 (0.8)		
Don't remember	54 (45.4)		
Few	42 (35.3)		
Many	22 (18.5)	54.613	0.0001

Participation on how the community will contribute to the water projects

Participated	45 (36.9)		
Not participated	77 (63.1)	1.520	0.218

Community contribution to water projects

Manpower	21 (45.7)		
Money	20 (43.5)		
Meetings	1 (2.2)		
Mobilization	2 (4.3)		
Advice	2 (4.3)	19.036	0.001

¹ Number of respondents; ² Percentage of respondents; 5% level of significant

In respond to a question of how many meetings had attended, majority (45.5%) claimed to attend meetings but did not remember number of meetings they attended while 18.4% attended many meetings with a mean score of 2.7 (cutting point being 2) and their perceptions differed significantly among respondents ($\chi^2 = 54.613$; $p = 0.0001$). This implied that majority had attended substantial number of meetings at this stage. Similar findings were observed by Marks et al. (2014) from Ghana and Marks and Davis (2012) from Kenya.

Furthermore, about 36.9% of the respondents participated on the meetings that decided on how the community will contribute to the water project (Table 2). About 45.7% respondents claimed that it was decided that the community will participate through provision of manpower, 43.5% through contribution of money; community mobilization and advice (4.3% each); this was mainly for leaders. Marks and Davis (2012) reported that in Kenya, community were involved in identification of key actors in water projects, decision on household contribution level and water tariffs. However, a few number of respondents (11.4%) claimed to be involved in selection of

technology of water project and their perception differs significantly ($\chi^2 = 73.374$; $p = 0.0001$) (Table 3). Likewise, a few number (16.3%) claimed to be involved in selection of site for a project, while 83.7% claimed not be involved and their perception differs significantly ($\chi^2 = 56.008$; $p = 0.0001$).

Table 3: Forms of community participation in the planning stage: selection of technology and site for a project

Variables	Freq/%	χ^2 value	p value
Participation in selection of technology			
Participated	14 ¹ (11.4 ²)		
Not participated	109 (88.6)	73.374	0.0001
Participation in selection of a site for water projects			
Participated	20 (16.3)		
Not participated	103 (83.7)	56.008	0.0001

¹ Number of respondents; ² Percentage of respondents; 5% level of significant

In most cases, matters related to technology and selection of site for water project involved technical aspects, as a result most decisions related to technical issues were handled and decided by technical personnel from municipal and donors with low local community participation. Similar findings were observed in a study conducted by Marks et al. (2014) in Ghana, Ofuoku (2011) and Akinbile et al. (2006) in Nigeria and Mandara (2014) in Dodoma, Tanzania. Marks et al. (2014) urged that community participation in management related decisions are likely to lead to more sustainable water projects than community involved in technical related decision.

Community participation in implementation stage

Local community were involved in several forms in the implementation of water projects (Table 4). About 42.2% of respondents participated through manpower while 48.8% did not participation through manpower and perception did not differs significantly ($\chi^2 = 0.962$; $p = 0.327$). Manpower contribution was through digging trench for distribution of pipes to the water points. On the other hand, a significant number (65%) contributed to water project through cash,

while 35% did not contribute money ($\chi^2 = 9.000$; $p = 0.0003$). According to qualitative data from focus group discussion, initially every household was supposed to contribute about 10,000 Tanzania Shillings (1USD = 1560 Tanzanian Shillings).

Table 4: Forms of community participation in the implementation stage: contribution through cash and manpower

Variables	Freq/%	χ^2 value	p value
Participation in implementation of water projects			
Man power			
Yes	47 ¹ (45.2 ²)		
No	57 (54.8)	0.962	0.327
Money			
Yes	65 (65.0)		
No	35 (35.0)	9.000	0.0003
Providing Advice			
Yes	19 (19.4)		
No	79 (80.6)	36.735	0.0001
Attending Meetings			
Yes	62 (59.6)		
No	42 (42.8)	105.462	0.001

¹ Number of respondents; ² Percentage of respondents; 5% level of significant

However, due to poverty, most household failed to contribute such amount of money. As a result, villages decided to sell part of their land (part of river) as a source of sand to house and road contractors. The money obtained was used as a community contribution to water projects. Marks et al. (2014) reported communities contributed in form of cash and labour towards construction cost of water project in Ghana, Marks and Davis (2012) in Kenya, and Masanyaniwa (2014a;b) in Dodoma, Tanzania. This implied that contribution through money and manpower are among common forms of community participation in development projects, including water projects.

Provision of advice and attending meetings were also mentioned as another forms of community participation in water projects (Table 4). A few number of respondents (19.4%) provided advice ($\chi^2 = 36.735$; $p = 0.0001$). In most cases, only influential and leaders were involved in provision of advices as a result only few people participated in provision of advice. In addition, significant number of respondents (59.6%) claimed to attending meetings related to the implementation of the projects ($\chi^2 = 105.462$; $p = 0.001$). Similar findings were observed by Marks and Davis (2012) in Kenya, Marks et al. (2014) in Ghana and Oloruntade et al. (2014) in Nigeria.

Community participation in Operational and Maintenance stage

Few number of respondents (31%) claimed to participate in meetings related to establishment of Operational and Maintenance (O & M) of water projects, and their perception differs significantly ($\chi^2 = 17.633$; $p = 0.0001$) (Table 5). On the other hand, almost 46% of respondents claimed to attend few meetings, while 15.9% attended many meetings, and 36.3% did not attend with a mean score of 1.8. This means on average community attended few numbers of meetings. Meetings during O & M stage are very important for sustainable management of water projects. A work of Marks et al. (2014) in Kenya found that community do meet regularly with water committee.

Furthermore, community were involved in operational and maintenance of water projects through establishment of water committees and paying fee for water services (cost sharing) (Table 5). About 38.5% of respondents were involved in establishment of water committees. Water committees were responsible for daily activities related to water projects. From focus group discussion, initially water committee were established as temporary committee by village leaders. However, until now no new committees were established. This might be a reason for few numbers of respondents to claim not to be involved in establishment of water committees. Community participation in establishment of water committees is one of common form of community participation in Tanzania (see URT, 2014; Mandara, 2014; Masanyiwa, 2014a;b).

Table 5: Forms of community participation in the operational and maintenance stage

Variables	Freq/%	χ^2 value	p value
Participation in meetings for establishment of O & M			

of water project's regulations

Participated	37 ¹ (30.8 ²)		
Not participated	83(69.2)	17.633	0.0001

How many meetings you have attended

Not attended			41 (36.3)
Few			53 (46.9)
Many	54.613	0.0001	18 (15.9)

Formation of water committees

Yes	45 (38.5)		
No	72 (61.6)	64.205	0.0001

Payment of user fee for water services

Pay	108 (94.7)		
Not pay	6 (5.2)	193.421	0.0001

¹ Number of respondents; ² Percentage of respondents; 5% level of significant

In addition, significant number of respondents (94.7%) were involved through paying for water services ($\chi^2 = 193.421$; $p = 0.0001$) (Table 5). Qualitative data showed that people buy a basket of water (20 Litres) for 100/= TAS. This money is deposited in village water fund account which is used for the maintenance of water projects. Mandara (2014) reported that communities of Kondoia and Kongwa districts in Dodoma, Tanzania were paying 20 Tanzanian Shillings (TAS) for a basket of 20 litres of water. Rural communities were found to be involved in identification of water committee members, in decision on household contribution level to the project, about water tariffs and about levels of services to be delivered (Marks and Davis, 2012; Marks et al., 2014; Ofuoku, 2011). Therefore, paying for water services is a common practice in rural water projects in Tanzania and developing countries in general.

Challenges facing community participation in water projects

Table 6 showed challenges faced community participation in water projects. A major challenge facing community participation in water projects was breakdown of infrastructure (95.6%) followed by poor cash contribution (61%) and lack of community's commitment to participation in water projects (18.8%). Qualitative data revealed that current water supply is not operational

as a result of the failure of water pump. Poor cash contribution was partly because of poverty among communities or perception that is the responsibility of the government to provide development including water project. Breakdown is one of the challenge faced water project in developing countries, including in Nigeria (Oloruntade et al., 2014) and Tanzania (Mandara, 2014; WaterAid Tanzania, 2009). Similarly, Oloruntade et al. (2014) reported that failure of the community to contribute money was due to poverty or as a result of belief that maintenance is a duty of the government.

Table 6: Challenges facing community participation in water projects (n = 126)

Variables	Frequency	Percentage
Breakdown of infrastructure	65 ¹	95.6 ²
Poor cash contribution	61	51.3
Lack of commitment in participation	12	18.8
Refuse to give land for projects	10	16.3
No compensation for properties	6	9.2
Unaccountability of leaders	7	10.9

¹ Number of respondents; ² Percentage of respondents

Another challenge that faced community participation was people refused to give out land for water project (10%); while 9.2% of respondents mentioned that people who gave up their land were not compensated (Table 6) and 10.9% mentioned unaccountability of leaders as another challenge. This implied that the cost foregone for compensation was born to individual while benefit was shared among the community. According to land policy of 1997 (URT, 1997) and Land Act of 1999 (URT, 1999) when land is taken away for development purposes, owners should be compensated accordingly. However, since the local government has no money, in most cases local community are requested or persuaded to give up their land for free, and therefore regarded as part of community contribution to development projects. During focus group discussion, it was learnt that water committees' leaders were not transparent, especially on financial matters. Similarly, Mandara (2014) found out that mismanagement of funds was one of the problems facing water projects in Tanzania. This might be a reason of general poor community participation as perceived in this study (see Tables 2 – 5, 7).

Level or extent of community participation in water projects

Community were asked to rate their level of participation in water projects in several stages of the projects. In planning stage, majority of respondents (60.8%) perceived to be very low and 18.3% rated as very good (Table 7) with mean score of 2.2 (cutting point is 3); and their perception differs significantly ($\chi^2 = 133.417$; $p = 0.0001$). In the implementation stage, 53.8% of respondents rated as very low participation, while 18.8% perceived their participation as moderate with means score of 2.3 (Table 7), and their perception was significantly different ($\chi^2 = 92.768$; $p = 0.0001$). Lastly, in O & M stage, majority of respondents rated as low (46.1%) and moderate (27.0%) and their perception differs significantly ($\chi^2 = 67.391$; $p = 0.0001$) with mean score of 2.9 (Table 6). This implied that overall community participation was poor to moderate with mean score of 2.7. Indeed, community participation seems to be low in initial stage and tends to improve in advanced stage (O & M). Low community participation can be due to the nature of activities related to the planning stage such as choose of technology and site for establishment of a project which were more technically oriented for the community to participate, consequently leaders and experts decided on their behalf. Indeed, the registered challenges might have constrained community to participate, hence perceived low level of community participation. Low level of community participation in water projects was also reported by Ofuoku (2011) and Akinbile et al. (2006) in Nigeria and urged that when community participation is low, executives such as water committee usually decides on their behalf.

Table 7: Level or extent of community participation in water project (N = 126)

Stages of project	Very low	Low	Moderate	Good	Very Good	χ^2 value	p value
Planning	73 ¹ (60.8 ²)	3 (2.5)	14 (11.7)	8 (6.7)	28 (18.3)	133.417	0.0001
Implementation	63 (53.8)	2 (1.7)	22 (18.8)	14 (12.0)	16 (13.7)	92.786	0.0001
Operation and Maintenance	2 (1.7)	53 (46.1)	31 (27.0)	15 (13.0)	14 (12.2)	67.391	0.0001

¹ Number of respondents; ² Percentage of respondents; 5% level of significant

Conclusion and Recommendations

The study revealed that communities were involved in several forms of participation. Different forms of community participation tend to vary with different stages of water project ranged from attending meetings to contribution in form of labour and cash. These findings underscore the need to assess forms of community participation in different stages of water projects, hence useful in improvement of community participation for sustainable water projects. Community faced with a number of challenges in participation in water projects including frequent breakdown of infrastructure, poor cash contribution, and lack of community participation in water projects. Unless these challenges are dealt with, the sustainability of the water projects is questionable in near future. The study also recorded low to moderate level of community involvement in water project; suggesting that community do participate in areas where they have competence and expertise, and probably reported challenges might have constrained community to participate, hence perceived low community participation. Understanding forms of community participation and challenges faced community participation is very important for consideration on investment and responsibilities, hence strengthens rural water planning, implementation and operational and maintenance for sustainable water projects. It is recommended that more emphases to be given on involvement of all stakeholders from the onset of the water projects; more and continuous training programmes related to water project management should be provided to the community, and in particular to water committee members, since user fees are not enough for catering maintenance costs, local government and Municipality in particular should establish a water basket funds to support O & M of water projects.

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