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# Households' Participation in Community Water Management in Peri-Urban Areas of Greater Accra Region, Ghana

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**Abstract**

The determinants of local households' participation and sustainability of peri-urban community-based water management encompasses known and unknown challenges. This paper aims to determine the drivers of peri-urban households' participation in water management systems in the Greater Accra Region (GAR). Data were collected using qualitative and a quantitative survey. Logistic regression model was applied as an analytical tool to examine the determinants of local households' participation. Findings indicated that the determinants of local households' participation have an impact on peri-urban community-managed water systems because, as local community participation increases, community awareness and spirit of ownership increase too, leading to facility sustainability. The study also concludes that there is a significant relationship between social change, heterogeneity community and determinants of local households' participation of peri-urban community-managed water facilities. Therefore, any attempt to analyse local households' participation in community-managed water system must be based on practical contexts rather than on assumptions.

**Keywords:** *participation, community and peri-urban*

## Introduction

### *Background of the Study*

The word 'participation' is often used without a clear and definite meaning. It is a broad term used in different disciplines and applied to many fields with many variations in meaning and interpretations. Karl (2000) defines participation as a process that empowers people and communities through acquiring skills, knowledge, and experience, leading to greater self-reliance and self-management.

Globally, local participation in community water management is growing rapidly. As a result, the determinants of households' participation in community water management, particularly in peri-urban areas, are changing as well (Kaliba, 2002). The 1990s was a global turning point in approaching water management, characterized by the commodification, internationalization and institutionalization of a global vision of water (De Gouvello & Scott, 2012). This situation changed the vision and perception of valuing water as a common or public good into seeing it as an economic good.

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The determinants of households' participation processes in water resources and supply management differ from country to country, time to time, project to project, and from donor to donor (Jønch-Clausen, 2004). It is also argued that such differences have made some variations of the levels of local households' involvement in decision-making and management (Akamani & Hall, 2015).

A study conducted at Kitase/Kyankama, Ghana, revealed that households' participation in local community meetings is still low (Addai, 2005). Community meetings are viewed as the best approach to involve local community in collective decision-making (ibid.). The associated problem in the world today is how local households under the era of globalization can be involved and determined in decision-making. Agarwal and Narain (1991) claim that local communities and households already have the knowledge and awareness of what they must have as their rights over their local resources. However, these 'rights' are determined by many factors. Most households have become passive observers, and a few people do make decisions on behalf of others. Isham and Kähkönen (1999) argue that, in some circumstances, the final decision is made by local leaders and outsiders who do not necessarily represent the preferences of local communities, although local communities participate in service design. This means, therefore, that the determinants of local households' participation vary among and at different levels of socio-economic growth.

***Sustainability of Peri-urban Community-Managed Water Systems***

Boume et al. (2003) define a peri-urban area as a countryside that is neither recognized as 'urban' (low density, lack of accessibility to social services, lack of services and infrastructure), nor 'rural' (loss of fertile soil, agricultural land, and natural landscape). It has characteristics of both urban and rural (rural-urban linkages) areas. Peri-urban zones are fast-growing areas because of the underlying pressure of speculative capital anticipating future urban growth. The government of Ghana defines a peri-urban area by the CWSA Act; 564' 1998 as "… a community that is not rural but is a small urban community with a population range from 2,001 to 5,000 and above" (CWSA, 2003).

Recent studies suggest that around one-third of water facilities, particularly hand pumps, in Sub-Saharan Africa are not functioning at all, or are performing below their designated standards (Adank et al., 2011, Jiménez et al., 2017). Fitts (2011) argues that there are substantially many hand pumps in Africa, although it is estimated that less than half of them are operational. The same study found that more than 80 percent of pumps were inoperable just one year after installation. In Ghana, the functionality of boreholes and water points varies with geographical locations, where different literature have estimated different figures as Table 1 shows.

It has been estimated that non-functionality and unsustainability rate of water supply in peri-urban locales is between 30% and 40% (WASHCost Ghana Survey, 2010). A study by Braimah and Jagri (2007) reveals that the major challenge

**Table 1: The Rates of Functionalities of Water Facilities**

| Author (Study) | Rates of functioning-% (findings) | Status of the System (Frameworks) |
|---|---|---|
| Bakalian & Wakeman (2009) | 10 | Boreholes are not working |
| Skinner (2009) | 58 | Water points need repair |
| Moriarty et al., (2011) | 30 | Water systems are non-functional |
| Nyarko et al., (2011) | 23 | Beneficiaries relying on rural point-systems accessing the nationally defined minimum level of service (in terms of quantity, quality, distance, and cost) |
| Nyarko et al., (2011) | 59 | Small towns beneficiaries' point-systems were accessing the nationally defined minimum level of service (in terms of quantity, quality, distance, and cost) |
| Nyarko et al., (2011) | 30 | Non-functionality rate of community-managed water systems |

confronting the water sector in Ghana is the limited emphasis given to the 'software' side of water supply management, and assumptions that households' participation can deliver efficient and effective water management. Ghana national guidelines for water suggest that water supply infrastructure should function by at least 95% of the time. Basic service level for hand pumps and standpipes is defined as 20 litres per capita per day of drinking water; no more than three hundred (300) people per borehole/standpipe, or 150 for a hand dug well; and less than 500m to a water point. These standards are also in line with those of the Ghana Standard Bureau (GSS, 2014).

Currently, there are three kinds of local or community-based management regimes in Ghana: (i) Local management of facilities, which are not considered by national community water and sanitation programmes (NCWSP) (streams, shallow wells); (ii) Local management of hand pumps under NCWSP; and (iii) Local management of small-town water systems under NCWSP. The NCWSP emphasizes on water supply coverage, and to a lesser extent functionality and continuity of the existing water systems, thus there is a need for water supply in peri-urban areas to shift from the current focus on building new infrastructure to a new focus on providing sustainable services. To adopt this shift will require a more understanding of factors that determine households' participation for sustainability, and to an agreed level of quality over time.

The determinants of households' participation in urban, peri-urban and rural community water facility management are crucial and should be understood to all water utilities (Naiga & Penker, 2014). Initially in Ghana, there was only one formal water service utility organization, namely the Ghana Water and Sewerage

Corporation (GWSC), which served in all areas: rural, small towns, peri-urban and urban. However, from the 1990s the water supply sector introduced two utilities—namely, the Community Water and Sanitation Agency (CWSA), and the Ghana Water Company Limited (GWCL)—for water supply delivery. GWCL is mandated to take care of urban areas, while CWSA acts as a services provider authority for rural and small towns.

The National Water Policy (NAWAPO) in Ghana treats rural and small towns (peri-urban) as a single unit, and there is no legal framework that determines the time at which an area's status changes or transforms from rural to peri-urban, and then from peri-urban to urban (GoG, 2007; GSS, 2015). The supply of water of these two utilities is determined by locale and the level of its growth. Peri-urban areas were left without any formal authority mandated to serve them, but also without understanding the determinants of households' participation in peri-urban community water facilities that could make them sustainable.

The discussion of local households' participation in public goods management, and the provision of social services in peri-urban water supply in particular, seems to be dominated by politics, the exercise of power, and urban biasness (Owusu, 2008; Jiménez et al., 2017). There is a little systematic evidence about how households' demographic and socioeconomic factors affect households' participation in public goods management (Prokopy, 2004; Whittington et al., 2009; Cox et al., 2010).

The study of this paper aimed to determine the drivers of peri-urban households' participation in water management systems in the Greater Accra Region (GAR), of Ghana. Understanding the determinants of households' participation in community-managed water supply in peri-urban is crucial for increasing households' participation and sustainability of water development.

Despite the significant importance of understanding the determinant factors of households' participation and sustainability in peri-urban areas, water policies and scholarly works have traditionally focused on urban and rural management settings (Loucks et al., 2005). Local households' participation has been advocated by academicians, practitioners, activists, and development organizations as a key aspect of sustainable development. Although there are several studies on household and community participation that have improved the understanding of the underlying processes and determinants of community participation, most have not considered the determinants of household participation (Mandar et al., 2013; Fisher et al., 2015; Alexandar et al., 2015). Therefore, exploring the major determinants of households' participation as a way of providing sustainable water supply in peri-urban areas is imperative.

Moreover, such a study in Ghana and other developing countries is important because the growth of urbanization outweighs the construction and renovation/

maintenance of water systems in peri-urban areas. For example, Owusu (2008) noted that, in Ghana, there were 114 small towns in 1970, which increased to 174 in 1984, and reached 336 by the year 2000. Also, the population of Ghanaians living in these small towns increased from 30.1% to 47.1% between 1975 and 2004, whereas in 2010 this was recorded at about 50.9% (GSS, 2012). This suggests that understanding the determinants of households' participation, which can lead to the sustainability of the existing and established new systems, is crucial since as the coverage rate of water supply increases, and so do the challenges of the sustainability of such systems.

As mentioned earlier, this study aims to fill the gap of the lack of studies on the determinant factors for community participation in peri-urban community water facilities, which so far has received little attention from scholars. In theoretical discourse, the study intends to add knowledge that deals with the effects of the change of socio-economic and demographic determinants on local community's participation in the sustainability of peri-urban community-managed water supply facilities under the era of globalization.

## Literature Review

### *Gender and Women Participation*

Demeke (2009) argues that participation of communities, and especially of women, in all water project cycle is very necessary. More attention is put on women because they play a more central role in the collection, management and use of water, as well as in general sanitation of a household than men. There is also evidence that more active involvement of women can optimize the results and impacts of community water projects (Mukherjee et al., 2003). Various summits and conferences have discussed and advocated women's participation in water management. For example, the Dublin Statement 1992, Principle No. 3, and the Rio Declaration (1992): all report that women play a central part in the provision, management and safeguarding of water.

Furthermore, the World Summit on Sustainable Development established millennium development goals (MDGs) target for gender equality and empowerment of women. This pivotal role of women as providers and users of water, and as guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources (Joshi & Fawcett, 2001).

### *Conceptual Framework*

The conceptual framework of this study is primarily concerned with understanding of the possible relationship that may exist among households' determinants of participation in peri-urban community-based water management. Fig. 1 shows the conceptual framework of this study that illustrates the complex interplay of this relationship.

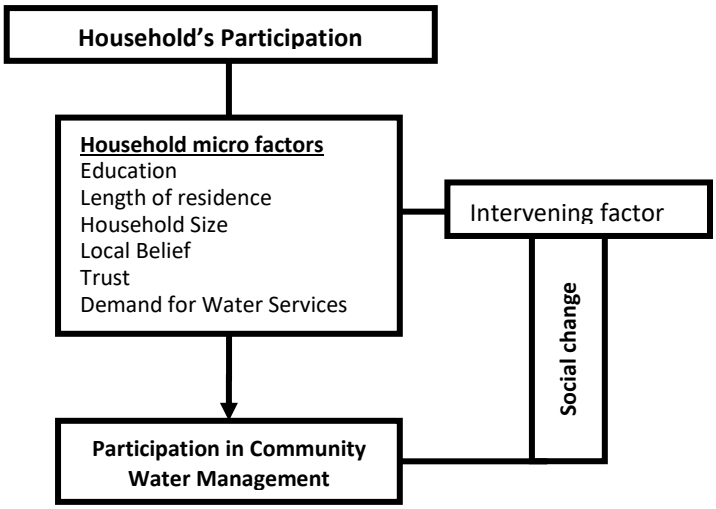


**Figure 1:** ***Conceptual Framework for Determinants of Local Participation and Sustainability of Peri-urban Community Water Supply***

**Source: Author's construct, 2016**

The conceptual framework of this study was guided by the argument that a community-managed water supply system in peri-urban areas is determined by the multiple interactions among household and community factors. The interaction can be either directional or by-directional. However, the degree and the determinants of household participation in peri-urban community-managed water supply cannot only be influenced by the level of social change, but also by a household's socio-economic, political and cultural status, and satisfaction with services. Households, and the community in general, must be effectively involved in all processes of a community water project cycle, which includes initiating/identifying, planning, implementation, monitoring and evaluation.

***Social Change and Cultural Dynamics***

Social change is commonly related to cultural dynamics. The fact that we are all human beings does not mean that we are all the same. Every moment we are being transformed, always growing over time. In peri-urban areas there are many different colours of cultural diversity. Social change is a learned process; it neither takes place through natural inheritance nor is it genetically transmitted. Rather, it takes place by a process of absorption and imitation from the social environment or through deliberate instruction. Social change is never static: it is dynamic. Similarly, the determinants of household's participation also change exactly in the same way as human beings change. Social change is a continuous process. In peri-urban urban areas such changes are being speeded up by the peri-urban-urban continuum and globalization. Despite the social change, participation continues to give a community a sense continuity, and binds it together.

**Methodology**

This study used a survey design approach to gather information at household level; information that best explains the determinants of local community participation in peri-urban community-managed water facilities. It employed random multi-stage sampling and stratified random sampling methods for the collection of quantitative data in three different communities with different population sizes. The selection of Simple Random Sampling (SRS) was based on the nature of a water facility and the beneficiaries themselves. There were three strata of communities and two strata of beneficiaries (household and non-household subscribers). The samples selected from the three communities meant to harmonize demographic differences among the participants involved in the study (Lonner & Berry, 1986). The determination of sample size was based on the population representation ratio of the three communities. The study applied Cochran's (1977) formula for sample size determination for both continuous and categorical data. As such, we selected 260 respondents from 6000 as per the Cochran's formula. The formula, as presented below, is applicable only if the margin of error is appropriate for a specific study.

$$n_0 = \frac{z^2 pq}{e^2} \quad \text{..... (1)}$$

Where, $n_0$ is the sample size, $z$ is the selected critical value of desired confidence level, $p$ is the estimated proportion of an attribute that is present in the population, $q$ = 1-$p$, and $e$ is the desired level of precision.

The sample size was calculated at 95% confidence level with a margin of error equal to (0.05).

$$\text{z} = 1.65, \text{p} = 0.5, q = (1 - 0.5), e = 005$$

$$n_0 = 272.25$$

The population of the study area as per the 2010 census was around 6000 people. The application of the Cochran's formula for calculating sample size when population size is finite is:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}} \text{ ... ... ... ... ... ... ... ... (2)}$$

Here, $n$ is the sample size, $n_0$ is the sample size derived from equation (1), and $N$ is the population size, which is 6000.

$$n = \frac{272.25}{1 + \frac{272.25-1)}{6000}}$$

$$n = 260.4743871 \approx 260$$

Therefore, the margin of error of the study is appropriate with Cochran's (1977) principle.

Using stratified random sampling, two steps were followed: first, identifying the beneficiary population for the three communities (Abokobi, Oyarifa and Teiman); and second, identifying the list of private household and non-household water subscribers (public standpipe points users) in each community. Communities using public standpipe points were determined by the GSA's principle that each standpipe point should serve at least 300 people. A proportionate number of households, according to the population size within each community and strata for both household and non-household subscribers, were randomly selected. The number of household subscribers, non-household subscribers, and the sample size selected in each community are shown in Table 2.

**Table 2: Categorization of SRS Stratum and Sample Size**

| Communities | Household Connected Subscribers | No. of Stand Pipe @ 300* | No. of People Served-Stand Pipe | Sample Size | |
|---|---|---|---|---|---|
| | | | | *Household Connected* | *Non-Connected* |
| Abokobi | 115 | 8 | 2,400 | 5 | 85 |
| Teiman | 231 | 4 | 1,200 | 10 | 42 |
| Oyarifa | 544 | 9 | 2,700 | 22 | 95 |
| **Total** | **890** | **21** | **6,000** | **37** | **222** |
| **Sample size** | | | | **260** | |

***Study Site Selection and Description***

The study selected the Greater Accra Region because its population is higher than that of any other region of Ghana (1,236 persons per km$^2$), while the national average is 103 people per km$^2$ (GSS, 2012). Data were collected in the three peri-urban communities in Ga East District, namely Abokobi, Oyarifa and Teiman. According to the GSS (2012), the Ga East Municipal Assembly is very densely populated with 1,564 people per km$^2$. These peri-urban communities were selected because they are connected to one source of water, which is located at Abokobi. The total number of people included in the sample was supposed to be 260 respondents/households, but 14 respondents did not complete the questionnaire, so the study used a 246-sample size for analysis. In the context of this paper, a head of a family is treated as a household. Since water is a shared household commodity, using a household as a unit of analysis was appropriate to cater for the needs of the research objectives. Copies of a structured questionnaire were distributed and administered to the three peri-urban areas of Abokobi, Oyarifa, and Teiman (AOT).

***Empirical Model***

Since the outcome variable in this study is discrete with two outcomes (participation and non-participation), the appropriate model to be used is either the linear probability model (LPM), the probit model, or the logit model. But due to the drawbacks associated with the LPM (namely: the probability not to be constrained to lie between 0 and 1; non-normality of the error term, heteroscedasticity of the error term and the questionable R-squared as a measure of the goodness of fit (Gujarati,

2004)), we deemed it inappropriate. Due to this, the study chose the logit model for estimation. In this model, the probability is modelled in such a way that it is constrained to lie between 0 and 1. The model assumes a logistic distribution.

The empirical model used is therefore

$$ln(p/1-p) = \beta_0 + \beta_1 age + \beta_2 sex + \beta_3 edu + \beta_4 yearssettled + \beta_5 indig + \beta_6 hhsize\ \beta_7 income + \beta_8 socnet + \beta_9 waterdemand + \beta_{10} politaffil + \mu \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where:

Age =age in years
Sex = 1 if male, 0 if female
Edu = education level
Yearssettled = number of years individuals settled
Indig = indigenous
Hhsize = household size
Income = household income
Socnet = social networks =1 if yes, 0 if no

Since the decision to participate or not to participate in community water management is a matter of household choice and is voluntary, the study employed the Logit Regression Model to identify factors influencing a household's decision to participate in peri-urban community water management. It measured the dependent variable for the logistic regression for household's participation in peri-urban community water management as a dummy: 1 for household's participation (voluntarily participating, contributing [money or non-monetary], contesting and voting in election) for participating in water issues, WATSAN and WSMT; and 0 for households not participating. Table 3 presents a definition of the variables used in the model to determine households' participation and expected signs.

**Table 3: Independent Variables in the Logistic Regression Model and the Expected Signs**

| Variable | Measurements | Units | Signs |
|---|---|---|---|
| $\delta_0$ | Intercept | | Coef/p.va |
| **Community Socio-economic and Institutional Factors** | | | |
| $Z_1$ | Age of household head | Years | +Ve/+Ve |
| $Z_2$ | Gender (1 = Male and 0 = Female) | Dummy | +Ve/+Ve |
| $Z_3$ | Highest level of Formal Education | Years | -Ve/+Ve |
| $Z_5$ | Years settled at that particular community | Years | +Ve/Ve |
| $Z_6$ | Indigenous (1 = Ga Dangme and 0 = others) | Dummy | +Ve/+Ve |
| $Z_7$ | Household size | Number | +Ve/+Ve |
| $Z_8$ | Income per household | GH₵ | +Ve/Ve |
| $Z_{11}$ | Social networks (1 = Yes and 0 = No) | Dummy | +Ve/+Ve |
| $Z_{13}$ | Demand for water services (1 = Yes and 0 = No) | Dummy | +Ve/+Ve |
| $Z_{14}$ | Political party affiliation (1 = Ruling, 0 = otherwise | Dummy | +Ve/+Ve |

**Source**: Author computations from Survey Data, 2017

Through logistic regression model, all variables were measured differently according to their nature. Age of household head and highest level of formal education were measured through a progression number of years. Gender, ethnicity, local beliefs, social networks, demand for services and political party affiliation were treated as dummy variables. Household size was treated as a continuous variable (number household members), while income per household was measured through Ghana Cedis (GH₵). Many of the variables are more socio-demographic than economic factors. Table 4 presents the results of logistic regression model of coefficient, marginal effect, Z-value, and P-value (significant level).

**Table 4: Logit Regression Model for determinants of local community participation**

| Variable | Coefficient | Marginal Effect | Z-Value | P-Value |
|---|---|---|---|---|
| **Constant** | -1.222 | | -1.61 | 0.107 |
| Age | 0.009 | 0.001 | 1.13 | 0.259 |
| Gender | 0.131 | 0.008 | 0.68 | 0.496 |
| Education | -0.314*** | -0.020 | -0.01 | 0.000 |
| Years Settled | 0.574*** | 0.036 | 7.30 | 0.000 |
| Indigenous | 0.212*** | 0.013 | 3.58 | 0.000 |
| Household Size | 0.131*** | 0.008 | 2.81 | 0.005 |
| Income | -0.000 | -0.000 | -0.39 | 0.695 |
| Social Networks | 0.002 | 0.000 | 0.05 | 0.961 |
| Demand for Service | 0.387*** | 0.024 | 3.57 | 0.000 |
| Political Affiliation | 0.343*** | 0.022 | 3.79 | 0.000 |
| LR chi2 (14) = 267.14 | | | | |
| Prob<chi2 = 0.0000 | | | | |
| Pseudo $R^2$ = 0.2565 | | | | |
| Number of observations = 246 | | | | |

**Note**: *** = 1% and * = 10%.

## Findings and Discussions

### *Determinants of Local Households Participation in Water Management*

*Education*

The results show that education is a significant predictor of local community participation (marginal effect = -0.314), and it is statistically significant at 1% level of significance. These results suggest that any additional year of schooling decreases the probability of a household's head participation in community water management and development projects by 0.314. The results do not support those of Isham and Kohkonen (2002) who found that average years of schooling had a positive association with household participation in community development projects. In peri-urban areas, dwellers are more educated than in rural areas. Therefore, the probability of a head of a household in rural areas participating in community-based water management is higher than in peri-urban areas (ibid). However, the water project is a peculiar case because of its necessity and need.

*Duration of Residence (years settled)*
The duration of time that a person has lived in a particular place is expected to have an impact on local community participation. This means that the more years one spends in a community, the higher the probability of participating in water management. Staying longer in a community increases the probability of participation by 0.036, and its marginal effect is statistically significant at 1% level of significance. This is in line with Chavez (2005): that the length of residence is a key exogenous factor that influences attitudes and behaviours towards community engagement in social and community development activities. Temporal and residential mobility operates as a barrier to the development of extensive social and local ties, hence affecting individuals' commitment to participation in peri-urban community management. Riger and Lavrakas (1981) found two dimensions of attachment that are communal in nature: a sense of *bondedness*, or feelings of being a part of one's community; and a sense of *rootedness* to a community. Manzo and Perkins (2006) argue that people with permanent residence are more emotional towards local development projects that affect their lives than mobile residents. In addition, long-term community stability engenders a collective use of local facilities despite urbanization.

*Indigenous Status*
The study area is dominated by indigenous Ga-Dangme ethnic group, followed by Ewe and Akan and other six ethnic groups. However, in running the regression, the indigenous Ga-Dangme ethnic group was treated as = 1, and others = 0. The results show that indigenous status has a positive coefficient and is significant for households' participation in peri-urban community-based water management at 1%. The condition or state of belonging to an indigenous group harmonizes community members to be involved in voluntary associations and social groups. Involvement in these activities helps community members to develop their own sense of community, which is often mobilized around the pride of indigenous status. People who feel they belong to a community abide by the rules of that community because they both internalize its ideology and face sanctions if they violate the rules (Manzuri & Rao, 2004). The probability of participation in peri-urban community-based water management is higher for Ga-Dangme by 0.013 compared to other ethnic groups. It can be argued that the other ethnic groups migrated either from within or outside of Greater Accra Region.

*Household Size*
In this study, household size was also used to determine household participation in local community development projects. As a household size increases, the probability of participating in peri-urban community-based water management increases by 0.008. The marginal effect is positive, and is statistically significant at 1% level of significance. Big-sized households prefer community water sources that are relatively cheaper than water tankers, hence they tend to be more active in community water management with an image that community participation is

embedded with the 'help-one-another' principle. The results also indicate that there is no correlation between household size and water utilization. Moreover, there was a correlation of water utilization between household and non-household subscribers. However, it is clear that the bigger a household size, the more conscious a household is on water utilization.

*Demand for Water Service*

Water is a basic need for human survival, and it is the second need after air. For this reason, there is no alternative to water. The probability of participation in water management for those who demand water is higher than for those who do not demand water by 0.024 since the marginal effect is positive. The difference is statistically significant at 1% level of significance. By using a dummy measurement, (1 = 'Yes' and 0 = 'No'), the results show that demand for water services has a positive effect and is significant at 1%. This construes that as the demand for water services increases, the probability of households participating in peri-urban community water management increases too. The theory of demand and supply stipulates that when supply is low for necessity goods and services like water, the demand goes higher, and so do the prices. Water demand in peri-urban areas is normally higher than supply. For example, Adank et al., (2011) revealed that the demand for water in Ghana in 2011 was three times higher than it was in 2007. This high growth in demand presents major challenges and chaos (ibid.). This is also the case of the study area, where the demand for water services was about to outweigh the supply.

*Political Party Affiliation and Participation in Water Projects*

What is suggested but not explicitly addressed in the literature on household participation is the underlying political party affiliations that influence the attitudes and behaviours of community members to participate in community development projects. The variable has a positive marginal effect (0.022), and is statistically significant at 1% level of significance. Arguably, household heads who are affiliated with a ruling political party are more likely to participate in peri-urban community-based water management than those who are affiliated with other parties, the difference in the probability being 0.022. However, political identity is not consistently related to participation when estimated separately for other ethnic groups (Lien, 1994).

There is much debate on the apparently poor performance of public water utilities resulting from political interference in the literature (McGregor, 2008). Politicians' interference in community development projects is geared towards gaining and maintaining their popularity. Similarly, the development of peri-urban community-based water projects, community participation and its sustainability are also linked with politics. The conventional water supply sector is particularly capital intensive, and since it does not attract private investment, it requires government intervention to finance such capital investments. As such politicians use this situation as their trump card.

## Conclusion

Regarding the determinants of local community participation in peri-urban community-managed water supply system, many variables have shown to have a positive correlation and are significant for participation in water management. These include: the duration a household has lived in a community, indigenous status, household size, demand for services and political party affiliation. Education and local beliefs had a negative correlation; but were significant as well. Age, gender, income, and social networks variables had positive relationships, which were however not significant.

Significant issues stemming from the study findings indicate the viability or importance of the determinants of households' participation in the decision-making process of a whole project cycle. Long-term households' participation in community water management requires the improvement of socio-economic and demographic factors, legal framework and policy innovation that are suited for community water management in rapid-growing peri-urban areas. In summary, it is interesting that socio-demographic factors such as education, years settled, indigenous and household size are significant determinants of households' participation in peri-urban community water facilities. The more the significances of socio-demographic determinants of household's participation in peri-urban community water supply systems, the more they may lead to sustainability.

### *Policy Recommendations*

Participation is a contested concept, and such contests have been assigned different meanings by different communities and stakeholders. What has not been acknowledged in policy and practice is the assigned different meanings that are being determined by the complex mix of social, economic, cultural, and political realities of the global world. Therefore, socio-demographic factors should be seriously considered as the main determinants of household's participation in peri-urban community water management.

Arguably, participation is assumed as voluntarily exercised. Studies show that under this era of globalization, the world has dramatically changed. For example, as peri-urban areas move upwards on the ladder of urbanization, the spirit of voluntarism diminishes (Beer & Koster, 2010). Undoubtedly, peri-urban lifestyle is becoming more market-oriented and commercialized, hence the WATSAN and WSMT commitments that are based on voluntary work could also diminish. Thus, the CWSA and DA should consider new approaches that do not assume a high amount of voluntary work. The National Water Policy (NAWAPO) treats rural and small towns (peri-urban areas) as a single unit. Empirically, this is not the case; NAWAPO should put a clear legal framework at a time when rural areas are transforming into peri-urban areas, and when peri-urban areas are transforming into urban ones.

This study has revealed several challenges confronting peri-urban community-managed water supply systems, and this suggests the need for further studies. The study was mainly specific: it looked at the determinants of household participation in sustainable community water facilities in peri-urban areas only. Therefore, there is a need for further researches on the determinants of households' participation in rural community water management to replicate the study.

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