International Journal of Development and Sustainability
Online ISSN: 2168-8662 – www.isdsnet.com/ijds
Volume 2 Number 2 (2013): Pages 871-890
ISDS Article ID: IJDS13010104

Special Issue: Development and Sustainability in Africa – Part 2

Socio-economic status of women and its influence on their participation in rural water supply projects in Ghana

Juliette Dufie Boateng [1*], C.K. Brown [2], E.Y. Tenkorang [2]

[1] *Central Regional Education Office, Ghana Education Service, Cape Coast, Ghana*
[1] *Institute of Development Studies, University of Cape Coast, Cape Coast, Ghana*

Abstract

This paper focuses on the socio-economic status of women and its influence on their participation in rural water supply provision and management in the Asante Akim South District in the Ashanti Region of Ghana. Using a mixed study approach, a multi-stage sampling technique is employed to select eight communities from four out of six towns operating under the Phase III of the Rural Water Supply Project (RWSP). A direct logistic regression used to assess the participation of women in rural water supply reveals that the socio-economic status of both WATSAN and household women respondents in AASD, as a set of predictors, reliably distinguished between women who showed high and low participation in all stages of RWSP except in operation and maintenance. The study concludes that irrespective of the socio-economic status of women in the district, efforts should be made for the promotion of their active participation rural water supply.

Keywords: Socio-economic status, Rural water supply, Participation, Water management

***Cite this paper as*:** Boateng, J.D. Brown, C.K. and Tenkorang, E.Y. (2013), "Socio-economic status of women and its influence on their participation in rural water supply projects in Ghana", *International Journal of Development and Sustainability,* Vol. 2 No. 2, pp. 871-890.

* Corresponding author. *E-mail address:* juliette.boateng6@gmail.com

1. Introduction

Women in rural developing areas are traditionally the main managers of domestic water supply at the local level. They traditionally play a major role in managing and maintaining communal water supply, regulating and controlling its social use and safe maintenance (SIDA, 1994). These socially constructed gender roles which are evident everywhere are common features in domestic water management practices; Ghana is no exception. Oheneba-Sakyi et al. (1996) have observed that the level of autonomy of women in Ghana is inextricably linked with their socio-economic status in the community. This is because while men and women share household tasks, women in general tend to carry a significant part (Yelbert, 1999) especially when it comes to water collection as well as support of the family through pursuit of multiple occupational roles to generate supplementary income when there are shortfalls in the upkeep from husbands. Thus, to avoid being labelled and stigmatised as a social deviant, the traditional Ghanaian woman has always sought to comply with some socially constructed roles which has placed them close to knowledge regarding natural resource management. Women, thus, protect, conserve and enhance water supply and access within and across the contexts of household, community, culture and subsistence livelihood conditions (Agarwal, 1992; Leach, 1992) These, therefore, depict that, for an improved water supply, women must be involved in its management. As stated by Chachange (1991) and Mbughuni (1993), women's empowerment and water advocacy at village level are crucial to the continued operation of water supply, and their empowerment will greatly improve their participation to ensure the effectiveness of sustainable development strategies.

Until recently, women in many parts of the world were not involved in decision-making in matters concerning them. However, men have traditionally been responsible for making decisions and have dominated the processes which affect the management of water supply (IRC, 1994). This is because when women are involved, the nature of their involvement relative to that of men is biased toward voluntary physical work, such as cleaning and greasing hand pumps and collecting payments. Following a review of the results achieved by Ghana at the end of the International Drinking Water Supply and Sanitation Decade (IDWSSD) in 1990, reforms were introduced in the early 1990s in order to accelerate the coverage of rural communities and small towns with good drinking water and sanitation facilities. A national rural water supply and sanitation conference, held at Kokrobite, near Accra in 1991, in recognition of the significant role women play in water management, proposed among other things that there should be a focus on the active involvement of women in designing, planning, operating, and managing of community water and sanitation projects (World Bank, 1991).

The establishment of the Community Water Supply and Sanitation Division (CWSD) (later transformed to an Agency by an Act of Parliament, Act 564 in 1998), a semi autonomous body under the then Ghana Water and Sewerage Corporation (GWSC), was to ensure the implementation of the Rural Water Supply and Sanitation Programme (RWSP). The driving force behind this approach is participation (Kendie, 1994) involving consultation with and participation by the local community in the design, planning, operation and maintenance of the water systems (Engel et al., 2005). The project outlines specific guidelines requiring that at least one third or 40% of the available leadership and management positions in the Water and Sanitation (WATSAN) committees must be allocated to women. This specified quota represents a clear and significant

departure from earlier projects, where communities were only appealed to and sensitised on the need to include more women in their local committees and then left to decide how they would do it and how far they wanted to reach out to women and elect them as leaders (Opare, 2005). Since non-compliance with the guidelines invariably meant exclusion from any benefits, the guidelines were largely adhered to.

However, as observed by Djegal et al. (1996) the quota does not always result in meaningful involvement of women in the decision-making process in some communities because very few women are given the role of secretary or treasurer; none is WATSAN chairperson. This is quite different in Zimbabwe where Dikito-Wachtmeister (2000) points towards a more complex view of why and how certain women are able to exercise authority as treasurers in her study on gender analysis. The study revealed a vast majority of water committee treasurers as women who were reluctant to give men charge of the money for fear they would spend it on beer.

The study by Dikito-Wachtmeister also revealed that the women actually chosen as treasurers were generally old and rich women whose husbands did not drink, or who had jobs. She indicates that this is due to the assumption that, in the case of working husbands, the money could be reclaimed from the man if the woman embezzled it. She however challenged the notion that if it were true that women possess naturally more trustworthy characters and, therefore, make better treasurers, it is questionable whether their performance in this role necessarily automatically advances gender equality.

Opare (2005) again notes that although some communities are willing to accept a predetermined quota of women in leadership positions on the WATSAN committees in order to qualify for project assistance, they still assign the key posts involving higher responsibilities to men, while women remain ordinary members with minimal influence (Saeed, 2003). This is because as Fournier and Kelemen (2001) noted in their analysis of women's limited management roles, behaviour characteristics such as rationality, objectivity, control and competitiveness, are perceived to be masculine images or typify male characteristics and are considered relevant for managing organisations, while women are generally seen as possessing caring, nurturing, and sharing qualities that are more suitable for domestic activities, the reproduction of the home and family. In addition, women are seen as emotional, while men are rational and, therefore, natural leaders in organisations. This notwithstanding, many studies have found that increasing women's participation in water management and policy will not only help them to mobilise the potential of water for development and ensure that water does not become a constraint to sustainable development, but also can lead to better operation and maintenance of water facilities which can help them contribute more to the economy of their households. For instance, a study by the International Resource Centre (IRC) of Community Water and Sanitation Project (CWSP) in 88 communities in 15 countries identified that projects designed and run with the full participation of women are more sustainable and effective than those that are not (Wijk-Sibesma et al., 2001). This appears to support an earlier World Bank (1989, p. 6) study that found that “exclusion of women from the design, planning and decision-making of water supply and sanitation projects in developing countries is a major obstacle to the improvement of their well-being”. However, since the introduction of the RWSP in Ghana in 1994 to date, relatively few studies have been conducted on women participation in rural water supply projects (Dotse et al., 1995; Sampa, 1996; Opare, 2005; Sam, 2006). This paper, thus, seeks to

explore whether socio-economic background of women has an influence on their level of participation in rural water supply provision and management in AASD in the Ashanti Region of Ghana.

2. Theoretical underpinnings

The late 1960s saw a series of debates around the term 'participation' when the contribution of rural communities to development projects, in the form of unpaid labour, was widely accepted as an important constituent and in most cases the only form of community participation. Although the term "participation" can be interpreted in various ways, depending on the context, its advocates often rely on two key arguments about its value, namely:

i. It makes for justice in decision-making - people have some say in, and influence on collective decisions; and

ii. It has an educative value - through participation people learn (Beetham, 1992).

Narayan (1995) perceives participation as a voluntary process by which people, including the disadvantaged (in income, gender, ethnicity or education), influence or control the decisions that affect them. He argues that the principle underlying participation, to give people a voice, is constant yet the choices that people make vary infinitely. Thus, the essence of participation is to exercise voice and choice. However, this conception does not assume that there is an ideal level of participation to be achieved.

Similarly, the World Bank (1996) views participation as a process through which the community influences and shares control over development initiatives, decisions and resources which affect them. Afful-Broni (2004) points out that, in participation there is the act of sharing in the activities of a group. This means that, participation is both a condition of sharing in common with others as fellows or partners and an individual or a group's involvement in a process which may not have originally been their own.

Garande and Dagg (2005) put it most aptly when they argued that genuine participation occurs when it is encouraged at an early stage of the project where discrepancies regarding project ideas are exposed and steps are taken to resolve or minimise these through a two-way consultation or mutual negotiations. They further argue that genuine participation does not occur when participation is listed at the bottom of project priorities and ignored the need to involve the community in the project from the start which often leads to project inefficiency and ineffectiveness. Thus, for participation to be authentic, it must move beyond common definitions that equate social inclusion with democratic engagement to the existence of social locators, such as gender, age and ethnicity as it has already been expressed by Narayan (1995). Such social locators differentially determine when, how and who participates, and bring all voices into deliberative decision-making at all points in the decision-making process (Mosse, 2001). An understanding of participation in this direction could, therefore, clarify and consider power relations, control and conceal interests in rural communities such that, if left unattended to, could undermine the long-term sustainability of development projects (Gleitsmann et al., 2007).

The study is underpinned by the Moser Gender Planning Framework. The approach introduces the idea of women's "three roles" in production, reproduction, and community management, and the implications that these roles have for women's participation in the development process.

Based on the work of Molyneux (1985), Moser (1994) argues that, because women and men have different positions within the household and different control over resources, they do not only play different changing roles in society but also often have different needs. She reiterates that women typically take on three types of roles in terms of their paid and unpaid labour. These triple roles are:

iii. reproductive (involves care and maintenance of the household and all its members);

iv. productive (involves production of goods and services for consumption and trade or work done for payment in cash or kind); and

v. community-based (involves organisation and management of community, events, services and politics through wages or increases in status and power).

With regard to needs, Moser (1994) distinguishes between strategic gender needs (SGNs) and practical gender needs (PGNs). Strategic Gender Needs are the needs women identify to overcome their subordinate position to men in their society. They relate to divisions of labour, power and control and may also include such issues as alleviation of the burden of domestic labour and childcare; freedom of choice; and measures against male violence and control over women Molyneux (as cited in Moser, 1994). Meeting such needs do not only help women to achieve greater equality it also changes existing roles and, therefore, challenges their subordinate positions. Such needs vary according to the economic, political, social and cultural context (Moser, 1994). Some actions that address strategic gender needs are:

vi. improving education opportunities, e.g. adult literacy classes, female teachers provided as role models and gender-aware textbooks;

vii. improving access to productive assets, e.g. legal status on land ownership, rights to common property and bank accounts;

viii. enabling women to take part in decision-making, e.g. participation in elections, representation at the local, provincial and national levels, and establishing and supporting women's groups; and

ix. promoting equal opportunities for employment, e.g. equal pay for comparable jobs (even if there is a gender division of labour) and increasing women's access to jobs traditionally done by men.

Practical gender needs, PGNs, in contrast, are needs women identify in their socially accepted roles in their community. Often, these needs are related to their roles as mothers, homemakers and providers of basic needs. Women do not challenge the gender divisions of labour or their subordinate position in society, although rising out of them. Practical gender needs are usually a response to an immediate perceived necessity which is identified by women within a specific context. They are practical in nature and are often concerned with deficiencies in living conditions, such as water provision, health care, and employment. Unlike the strategic needs, practical needs are formulated directly by women in these positions, rather than through external interventions. As Molyneux has stated, 'they do not generally entail a strategic goal, such as

women's emancipation or gender equality... nor do they challenge the prevailing forms of subordination even though they arise directly out of them' (Moser, 1994, p.40). They arise as needs for women out of their impoverished situation. Projects can meet the practical gender needs of both men and women without necessarily changing their relative positions in society. Examples of actions that address practical gender needs are:

x. reducing women's workload, for instance, locating stand-pipes and hand-pumps, providing grinding mills and developing fuel-efficient stoves;

xi. improving health, such as, primary health centres, clean water supply and child spacing/family planning advice;

xii. improving services, such as, primary schools, housing infrastructure and transport facilities and;

xiii. increasing income, through skills training, credit initiatives and access to markets.

Coates (1999) maintains that both PGNs and SGNs cannot be neatly separated. He points out that every practical intervention has an effect on strategic areas of life (power relations and control), whether it is intended or not (March et al., 1999). However, in assessing Moser's gender roles and needs, Shahrashoub and Miller (1995) point out that the focus on needs could not only make planning top-down, but also may create passive beneficiaries.

3. Methodology

The study employed the evaluative and cross-sectional survey designs which involved the collection of data on the assessment of the influence of the socio-economic status of women and their participation in rural water supply projects from respondents across some selected communities operating under the Rural Water Supply Project (RWSP) phase III within AASD. A multi-stage sampling technique was employed in the study. Four towns with twelve communities were randomly sampled from the six beneficiary towns operating under RWSP phase III. Two communities were selected from each of the four towns using the simple random sampling technique. In all, eight communities were selected. The selected communities had 752 households, from which 256 households were finally sampled for the study. The household selection was based on Krejcie and Morgan's table for determining sample size from a given population (Sarantakos, 2005). The table suggests that, for a population of 752, a sample size of 256 is convenient. The 256 households sampled for the study was equally distributed among the eight selected communities to obtain information about women's role in rural water supply projects. The "day code" of the Afrobarometer sampling technique was employed to establish an interval (n) for household selection (Afrobarometer, 2007). One respondent per household was selected. Women and men aged 18 years and above, who had stayed in the community for at least two years, formed the sampling unit for the selection. In all 256 household respondents with a mean age of 41.8, and a standard deviation of 14.5 years were selected for the study.

The purposive sampling technique was employed in the selection of females WATSAN committee members. In addition to this, two males in the WATSAN committee were also randomly selected from each of

the eight communities. In all, 41 WATSAN committee members comprising 16 males and 25 females were selected. The views of male WATSAN committee members were relevant because they helped in explaining and complementing further information on assessment of the influence of the socio-economic status of women and their participation in rural water supply projects in the district.

3.1. Instrument

Interview schedules and focus group discussions (FGDs) were the instruments used for data collection. Two sets of interview schedule were used: one for male and female household respondents, and the other for WATSAN committee members. The interview schedule for household respondents was in three sections: Section A was on biographic data and socio-economic background of respondents; Section B examined the roles of women and men in the five stages in rural water supply system; Items in Sections B were rated on a five-point Likert type scale format, with 5 being strongly agree and 1 strongly disagree.

The interview schedule for WATSAN committee members was in two sections: Section A was on biographic data of respondents, while Section B examined the managerial roles of WATSAN committee members, and the extent to which women were involved in WATSAN activities. Focus group discussion (FGD) was used to triangulate and gain deeper insight into information obtained from the interview schedule. The content of the FGD was from central themes of the interview schedule. The FGD centred mainly on the roles men and women play in the five stages of RWSP provision and management and the role WATSAN committee members play in managing water in the community.

3.2. Data analysis

Data were subjected to series of item analyses in order to identify items whose removal would enhance the internal consistency of the instrument. Cronbach alpha was used to determine the reliability coefficient of the instrument. Since the instrument for the interview schedule for the individual household respondents was multidimensional in nature, reliability for each dimension was determined. The reliability coefficients obtained for the dimensions were; decision-making and planning, 0.93; project construction, 0.78; project implementation, 0.83; project operation and maintenance, 0.72; monitoring and evaluation, 0.94. The instrument for the WATSAN committee members was unidimensional and, therefore, the reliability coefficient was estimated to be 0.81, with inter-item correlations of the items greater than 0.40. The reliability coefficients obtained for the instruments for both the household respondents and WATSAN committee members exceeded a threshold value of 0.60, which is acceptable for research purposes (Nunnally, 1968, as cited in Pallant, 2007). The direct logistic regression was used to assess the influence of socio-economic status of women on their level of participation in rural water supply provision and management. It was used because of its ability to accept independent variables of varying measurement levels and explore the influence of socio-economic status of women on their level of participation in all five stages of RWSP (Pallant, 2007). Also, the direct logistic regression is robust, less sensitive to outliers, skewed, and estimates the odd ratios for each variable to determine how much each of the socio-economic status indicators of women was likely to explain the level of participation of women in the eight communities of Asante Akim

South District (Nwakeze, 2007). Subsequently, the level of participation was recoded into binary function, with 0 representing low participation and 1 indicating high participation.

4. Results and discussion

4.1. Influence of socio-economic status of women on their level of participation in the stages of RWSP provision in AASD

The investigation into the influence of socio-economic status of women household respondents on their level of participation in the five stages of rural water supply provision was assessed in the following areas, namely: decision-making and planning; project construction; project implementation; operation and maintenance; and monitoring and evaluation. These stages of RWSP were, therefore, used as dependent variables. Socio-economic background indicators, such as age; educational background; marital status; number of years stayed in the community; and occupation, served as the independent variables.

4.1.1. Logistic regression predicting the likelihood of women's participation in decision-making and planning of RWSP

The direct logistic regression analysis on whether the socio-economic status of women influenced their level of participation in decision-making and planning of RWSP in AASD is shown in Table 1. This was to assess the influence of socio-economic status of women on the likelihood that they would demonstrate high participation in decision-making and planning of RWSP. A test of the full model, with all five predictors, namely: age; educational background; marital status; number of years stayed in the community; and occupation, and a constant-only model, was statistically significant, with a Chi-square of 39.09 and $p < 0.001$, indicating that the predictors, as a set, reliably distinguished between women who reported low and high participation at this stage of the programme.

The model explained between 22.5% (Cox and Snell R square) and 30.8% (Nagelkerke R squared) of the variance in the level of participation in decision-making and planning, and correctly classified 77.1% of women.

The results further show that only one independent variable, educational level, reliably predicted women's level of participation, among all the levels. Women who had attained secondary education made a unique statistically significant contribution to the model, recording an odds ratio of 13.29. This indicated that women who had attained secondary education in the communities used for the study in AASD were over 13 times more likely to participate in decision-making and planning than those who had no secondary education, when all other factors in the model were controlled. The possible reason accounting for the high participation of women with secondary education might be that such women have gained some positive self-image to be able to express themselves during decision-making and planning fora.

Table 1. Logistic regression predicting the likelihood of women's participation in decision-making and planning of RWSP

Socio-economic Variable	*B*	SE	Wald	*P*	Odds Ratio	95% CI for Odds Ratio Lower	Upper
Age	0.02	0.02	0.68	0.41	1.02	0.98	1.07
No. of yrs	0.01	0.02	0.51	0.47	1.01	0.98	1.04
Primary	0.73	0.61	1.44	0.23	2.07	0.63	6.84
Secondary	2.59	0.71	13.37	0	13.29	3.32	53.16
Tertiary	22.89	40192.97	0	1	0	0	
Married	1.18	0.66	3.24	0.07	3.26	0.9	11.84
Divorced	0.98	0.76	1.65	0.2	2.67	0.6	11.92
Widowed	-0.32	1.04	0.09	0.76	0.73	0.1	5.61
Trading	-0.1	0.8	0.02	0.9	0.9	0.19	4.35
Artisan	-0.57	1.03	0.31	0.58	0.57	0.08	4.26
Farming	0.98	0.89	1.22	0.27	2.67	0.47	15.17
Public servant	0	1.31	0	1	1	0.08	12.9
Constant	-3.93	1.28	9.4	0	0.02		

n=153, χ^2 = 39.09, df = 12, p = 0.001; Cox & Snell R square = 22.5%, Nagelkerke R squared = 30.8%, Correct classify = 77.1%

Source: Fieldwork, 2010

4.1.2. Logistic regression predicting the likelihood of women's participation in project construction of RWSP

The results of the direct logistic regression performed to assess the influence of socio-economic status of women on the likelihood that they would highly participate in project construction are presented in Table 2. A test on the full model containing all five predictors, was statistically significant, (χ^2 (12, n=153), 50.29, p<0.001), indicating that the model was able to distinguish between women who showed high and low participation during project construction in RWSP. The model as a whole explained between 28.0% (Cox and Snell R square) and 38.3% (Nagelkerke R squared) of the variance in the level of participation in project construction, and correctly classified 76.5% of the women.

Furthermore, only two independent variables, educational level (secondary) and occupation (farming), reliably predicted women's level of participation in project construction (Table 2). The strongest predictor of higher participation was farming, recording an odds ratio of 15.67. This indicated that women who were into

farming were 15 times more likely to show high participation in project construction than those who were engaged in other occupations when all other factors in the model were controlled. Likewise, women whose educational background was up to the secondary level were over 8 times more likely to show a high level of participation than those who had not attained secondary education, holding all other factors in the model constant.

Table 2. Logistic regression predicting the likelihood of women's participation in project construction of RWSP

Socio-economic Variable	*B*	SE	Wald	*P*	Odds Ratio	95% CI for Odds Ratio Lower	Upper
Age	-0.02	0.02	0.53	0.47	0.98	0.94	1.03
No. of yrs	0	0.02	0.03	0.86	1	0.97	1.03
Primary	-0.04	0.56	0.01	0.93	0.96	0.32	2.86
Secondary	2.11	0.73	8.44	0	8.28	1.99	34.49
Tertiary	20.97	40192.97	0	1	0	0	
Married	0.25	0.64	0.15	0.7	1.28	0.36	4.51
Divorced	0.06	0.73	0.01	0.94	0.95	0.23	3.96
Widowed	-1.08	0.95	1.31	0.25	0.34	0.05	2.17
Trading	-0.74	0.8	0.88	0.35	2.11	0.44	10
Artisan	-1.6	1.11	2.07	0.15	4.97	0.56	44.04
Farming	2.75	0.97	7.97	0.01	15.67	2.32	105.48
Public servant	1.24	1.43	0.76	0.38	3.47	0.21	56.9
Constant	-0.42	1.19	0.13	0.72	0.65		

n = 153, χ^2 = 50.29, df = 12, p < 0.001, Cox and Snell R square =28.0%, Nagelkerke R squared = 38.3%, Correctly classified = 76.5%

Source: Fieldwork, 2010

4.1.3. Logistic regression predicting the likelihood of women's participation in project implementation of RWSP

A direct logistic regression was performed to assess the influence of socio-economic status of women and their level of participation in project implementation. The full model containing all five predictors, yielded statistical significant results, (χ^2 (12, n=153), 25.51, p <0.01) indicating that the model was able to

distinguish between women who reported low and high participation during project implementation. The model as a whole explained between 15.4% (Cox and Snell R square) and 23.1% (Nagelkerke R squared) of the variance in the level of participation in project implementation, and correctly classified 78.4% of the women (Table 3).

Table 3. Logistic regression predicting the likelihood of women's participation in project implementation of RWSP

Socio-economic Variable	*B*	SE	Wald	*P*	Odds Ratio	95% CI for Odds Ratio Lower	Upper
Age	-0.04	0.03	2.13	0.14	0.96	0.91	1.01
No. of yrs	0.03	0.02	3.14	0.08	1.03	1	1.07
Primary	0.52	0.66	0.62	0.43	0.6	0.16	2.16
Secondary	1.01	0.68	2.24	0.13	2.76	0.73	10.4
Tertiary	0.62	43454.45	0	1	1.73	0	
Married	0.01	0.65	0	1	1.01	0.28	3.63
Divorced	0.46	0.77	0.35	0.55	1.58	0.35	7.19
Widowed	0.45	1.03	0.19	0.66	1.56	0.21	11.65
Trading	1.08	1.13	0.91	0.34	2.95	0.32	27.2
Artisan	2.48	1.26	3.86	0.05	11.27	1	142.24
Farming	2.23	1.22	3.36	0.07	9.27	0.86	100.39
Public servant	-18.43	16517.09	0	1	0	0	
Constant	-2.33	-1.23	2.41	0.12	0.1		

n = 153, χ^2 = 25.51, df = 12, p < 0.01, Cox and Snell R square = 15.4% Nagelkerke R squared = 23.1%, Correctly classified 78.4%

Source: Fieldwork, 2010

The results further show that among the independent variables, occupational status (artisan) made a unique statistically significant contribution to the model recording an odds ratio of 11.27. Thus, it can be concluded that women who were artisans were 11 times more likely to show high participation in project implementation than those who were not, controlling for all other factors.

4.1.4. Logistic regression predicting likelihood of women's participation in operation and maintenance of RWSP

A direct logistic regression analysis performed to assess the influence of socio-economic status of women on the likelihood that they would show high participation in operation and maintenance is shown in Table 4. A

test on the full model containing all five predictors was not statistically significant (χ^2 (12, n = 153), 20.28, p < 0.06), indicating that the model was not able to distinguish between women who showed high and low participation during operation and maintenance in RWSP. The model, as a whole, however, explained between 12.4% (Cox and Snell R square) and 16.7% (Nagelkerke R squared) of the variance in participation level, and correctly classified 64.1% of women.

Table 4. Logistic regression predicting likelihood of women's participation in operation and maintenance of RWSP

Socio-economic Variable	*B*	SE	Wald	*P*	Odds Ratio	95% CI for Odds Ratio Lower	Upper
Age	-0.02	0.02	0.67	0.41	0.98	0.94	1.02
No. of yrs	0.01	0.01	0.37	0.54	1.01	0.98	1.03
Primary	0.65	0.51	1.61	0.2	1.91	0.7	5.18
Secondary	1.24	0.59	4.45	0.03	3.46	1.09	10.98
Tertiary	21.6	40192.97	0	1	0	0	
Married	-0.84	0.59	2	0.16	0.43	0.13	1.38
Divorced	-0.78	0.68	2.12	0.15	0.37	0.1	1.41
Widowed	-0.58	0.87	0.45	0.5	0.56	0.1	3.06
Trading	1.11	0.73	2.34	0.12	3.04	0.73	12.6
Artisan	1.8	0.97	3.47	0.06	6.07	0.91	40.55
Farming	2.19	0.84	6.81	0.01	8.94	1.72	46.32
Public servant	1.61	1.22	1.74	0.19	4.98	0.46	54.04
Constant	-0.61	1.06	0.33	0.56	0.54		

n = 153; χ^2 = 20.28; p = 0.06; df = 12, Cox and Snell R square = 12.4% Nagelkerke R squared = 16.7%

Source: Fieldwork, 2010

4.1.5. Logistic regression predicting the likelihood of women's participation in monitoring and evaluation of RWSP

A direct logistic regression analysis was performed on monitoring and evaluation and the five socio-economic background predictors to assess the influence of socio-economic status of women in the eight communities in AASD on the likelihood that they would highly participate in monitoring and evaluation in RWSP. The results are presented in Table 5. The full model containing the socio-economic background predictors was statistically significant (χ^2 (12, n = 153) = 54.96, p < 0.001), indicating that the model was able to distinguish between women whose participation in the monitoring and evaluation stage of RWSP were high or low. The model as a whole explained between 30.2% (Cox and Snell R square) and 40.7%

(Nagelkerke R squared) of the variance in levels of participation in monitoring and evaluation of RWSP, and correctly classified 76.5% of women.

Table 5. Logistic regression predicting the likelihood of women's participation in monitoring and evaluation of RWSP

Socio-economic Variable	*B*	SE	Wald	*P*	Odds Ratio	95% CI for Odds Ratio Lower	Upper
Age	-0.04	0.03	2.25	0.13	0.98	0.92	1.01
No. of yrs	0.02	0.02	1.29	0.26	1.01	0.99	1.05
Primary	-0.35	0.57	0.38	0.54	1.91	0.23	2.15
Secondary	2.06	0.72	8.23	0	3.46	1.92	31.98
Tertiary	20.62	40192.97	0	1	0	0	
Married	1.34	0.66	4.12	0.04	0.43	1.05	13.98
Divorced	0.78	0.75	1.08	0.3	0.37	0.5	9.44
Widowed	0	0.97	0	1	0.56	0.15	6.73
Trading	0.88	0.82	1.14	0.29	3.04	0.48	12.03
Artisan	0.77	1.05	0.54	0.46	6.07	0.27	16.93
Farming	2.92	0.99	8.64	0	8.94	2.65	130.13
Public servant	1.74	1.49	1.36	0.24	4.98	0.31	106.1
Constant	-1.23	-1.23	1	0.32	0.54		

n = 153; χ^2 = 54.96; df = 12, p < 0.001, Cox and Snell R square 30.2%; Nagelkerke R squared 40.7%; Correctly classified 76.5%

Source: fieldwork, 2010

The results, again, show that only three of the socio-economic variables (secondary education; marriage, and farming) made unique statistically significant contribution to the model. The strongest predictor of women's level of participation at the monitoring and evaluation stage was farming, recording an odds ratio of 8.94. This indicated that women who were farmers were over 8 times more likely to participate in monitoring and evaluation than those who were not farmers, controlling for all other factors in the model. The odds ratio of a person with secondary education participating at monitoring and evaluation stage is 3.46 times higher than those without secondary education, all factors being equal. The odds ratio of 0.43 which is the lowest predictor of women's level of participation at the monitoring and evaluation stage was marriage. Thus, married women were over 0.4 times more likely to participate in monitoring and evaluation in RWSP. The active participation of married women in monitoring and evaluation, however, refuted Duncan's (1998) views that women's marital status affects their ability to respond to calls to take on a community leadership role in rural areas as a result of some restrictions placed on them by their husbands.

The results from the analysis on whether socio-economic status of women influences their level of participation in the five stages of RWSP in AASD showed that active participation of women who had attained secondary education was crucial during decision-making and planning, construction, and operation and maintenance levels in RWSP management in the district.

Furthermore, regarding the active participation of women who were farmers in project construction, operation and maintenance, and monitoring and evaluation of RWSP, the FGD held at the various communities in the district revealed that community work was scheduled on taboo days for farming. These times favoured women farmers, hence their active participation in these stages of RWSP in the district.

4.2. Influence of socio-economic status of WATSAN women on their level of participation in RWSP management in AASD

The influence of socio-economic status of women in WATSAN on their level of participation in RWSP management was performed using the direct logistic regression. Five independent variables (predictors) were considered under the socio-economic status. These were: age, marital status, educational level, occupation and number of years stayed in community. Dependent variables considered under RWSP management were: decision-making on budget allocations; project implementation, and operation and maintenance.

4.2.1. Logistic regression predicting the likelihood of WATSAN women's participation in decision-making on budget allocations in RWSP management

Table 6. Logistic regression predicting the likelihood of WATSAN women's participation in decision-making on budget allocations in RWSP management

Socio-economic Variable	*B*	SE	Wald	*P*	Odds Ratio	95% CI for Odds Ratio Lower	Upper
Age	1.42	1977.07	0	1	4.12	0	-
No. of yrs	1.77	2676.86	0	1	5.86	0	-
Primary	16.16	46771.75	0	1	0	0	-
Secondary	75.28	26059.52	0	1	0	0	-
Married	-84.92	65153.46	0	1	0	0	-
Divorced	-73.34	47633.37	0	1	0	0	-
Farming	-9.61	45927.96	0	1	0	0	-
Constant	-173.33	69822.89	0	1	0		

n = 25, χ^2 = 25.15, df = 7, p<0.001, Cox and Snell R square 63.4%, Nagelkerke squared 91.0%, Correctly classified 96%

Source: Fieldwork, 2010

A direct logistic regression analysis was performed on the level of participation of WATSAN women in decision-making on budget allocations and the five socio-economic predictors. A test of the full model with all five predictors, against a constant-only model was statistically significant χ^2 (7, n = 25) = 25.15, p < 0.001, indicating that socio-economic variables as a set reliably distinguished between women whose participation was active or high and those whose participation was low during this stage. Classification was quite impressive, with 63.4% (Cox and Snell R square) and 91.0% (Nagelkerke squared) showing the variance in their level of participation in decision making on budget and correctly predicting an overall success rate of 96%. The results, however, showed none of the predictors reliably predicting the level of participation of women in decision-making on budget allocations as indicated in Table 6.

4.2.2. Logistic regression predicting the likelihood of WATSAN women's participation in decision-making on project implementation in RWSP management

Table 7. Logistic regression predicting the likelihood of WATSAN women's participation in decision-making on project implementation in RWSP management

Socio-economic Variable	*B*	SE	Wald	*P*	Odds Ratio	95% CI for Odds Ratio Lower	Upper
Age	6.59	1577.25	0	1	726.6	0	-
No. of yrs	-4.56	1358.66	0	1	5.86	0	-
Primary	-16.94	45309.12	0	1	0	0	-
Secondary	-37.67	11984.28	0	1	0	0	-
Married	48.48	21678.75	0	1	0	0	-
Divorced	-45.58	30184.7	0	1	0	0	-
Farming	-21.52	33197.06	0	1	0	0	-
Constant	-117.75	45220.02	0	1	0		

n = 25, χ^2 = 17.49, df = 7, p < 0.02, Cox and Snell R square 50.3%, Nagelkerke R squared 86.0%, Correctly classified 96%,

Source: Fieldwork, 2010

A direct logistic regression was performed to assess the impact of the five socio-economic variables on the likelihood that WATSAN women would participate actively during decision-making on project implementation in RWSP during WATSAN meetings in the eight communities in AASD. The full model containing all the predictors was statistically significant, χ^2 (7, n = 25) = 17.49, p < 0.02, indicating that the model was able to distinguish between women who participated actively and those who did not during this stage (Table 7).

The model as a whole also explained between 50.3% (Cox and Snell R square) and 86.0% (Nagelkerke R squared) of the variance in the level of participation in decision making on project implementation, and

accurately classified 96% of women. However, the results show that none of the predictor variables distinguished between the levels of participation of women in decision-making on project implementation in RWSP during WATSAN meetings in AASD.

4.2.3. Logistic regression predicting the likelihood of WATSAN women's participation in decision-making on operation and maintenance in RWSP management

As regards the influence of socio-economic status of women on the likelihood that women would show high participation in decision-making on operation and maintenance of RWSP, a test of the full model of the direct logistic regression analysis, performed with all five predictors, was not statistically significant (χ^2 (7, n=25) = 9.44, p = 0.22), indicating that the predictors, as a set, did not reliably distinguish between women who exhibited high and low participation (Table 8). The results in Table 8 also show that none of the predictors made a unique contribution to the model.

The results on the assessment of the influence of socio-economic status of women in WATSAN and their level of participation in RWSP management revealed that socio-economic status, as a set, reliably distinguished between women whose participation was high and low in each of the decision-making processes. However, none of the socio-economic indicators made a unique prediction on women's level of participation. The results from the FGDs corroborated this finding when a 56-year old man, for example, remarked:

Anybody who actively involves him/herself in communal work is selected not by any acquired or special status. Whether a man or woman, we are the same and nothing prevents anybody to avail him/herself for that. The findings, therefore, did not support the views by Simpson-Herbert (1992); Duncan (1998); and Hemson (2002) that certain socio-economic factors, such as marital status, educational level, and occupation, influence the level of participation of women in water committees.

In summary, the study identified that socio-economic background of women, as a set, was a critical determinant for their level of participation of RWSP in the eight communities in AASD except in operation and maintenance. The participation of women who had attained, at least, secondary education was very important during decision-making; project construction; and operation and maintenance stages of RWSP. The participation of women who were engaged in farming was important in project construction, operation and maintenance and monitoring and evaluation of RWSP. Women who were either married or artisans in AASD played active roles in project implementation, and monitoring and evaluation. The socio-economic background of WATSAN women, as a set, was a critical determinant for their level of participation in decision-making in budget allocations and project implementation but not in operation and maintenance in RWSP management in AASD.

Table 8. Logistic regression predicting the likelihood of WATSAN women's participation in decision-making on operation and maintenance in RWSP management

Socio-economic Variable	*B*	SE	Wald	*P*	Odds Ratio	95% CI for Odds Ratio Lower	Upper
Age	2.18	2011.21	0	1	8.84	0	-
No. of yrs	0.94	2876.36	0	1	2.57	0	-
Primary	31.38	50377.7	0	1	0	0	-
Secondary	9.12	22174.96	0	1	0	0	-
Married	-68.64	72048.36	0	1	0	0	-
Divorced	-57.22	56004.35	0	1	0	0	-
Farming	-55.31	60969.9	0	1	0	0	-
Constant	-184.96	86459.55	0	1	0		

n=25; χ^2 = 9.44; df = 7; p = 0.22, Cox and Snell R square 31.4%, Nagelkerke R squared 73.6%, Correctly classified 96%

Source: Fieldwork, 2010

5. Policy implications

The findings of this study provide evidence that socio-economic status of both household women respondents and WATSAN committee members in AASD, as a set of predictors, reliably distinguished between women who showed high and low participation in decision-making and planning; project construction; project implementation; and monitoring and evaluation and during decision-making in budget allocations; implementation and monitoring and evaluation meant that to improve women's participation in these areas socio-economic status need to be given the necessary attention.

6. Recommendations

It is recommended that community leaders should:

1. Encourage the participation of all women in the eight communities to participate in all stages of RWSP. This could be done by assigning specific roles to them, irrespective of their status in the community.
2. Encourage the participation of women, who have attained secondary education, during project implementation and monitoring and evaluation stages of RWSP, by putting them in-charge of these stages.

3. Encourage the participation of women, who are farmers, during decision- making process and project implementation of RWSP by scheduling decision-making fora on taboo days when farming is prohibited or during the non-farming season.
4. Encourage married women and women artisans in AASD to play active roles during decision-making fora, project construction, and operation and maintenance stages. Such activities must be scheduled in the evenings when married women have finished with their household chores and the artisans have closed from work.
5. Devote enough time and effort to train and convince all women in WATSAN committees that their public role in RWSP management is complementary to their domestic and economic activities. Such training sessions must indicate the benefits of women's participation in public life.

References

Afrobarometer (2007), "Round 4 survey manual", *The Afrobarometer Network*. Retrieved August 20, 2009, from: www.afrobarometer.org.

Afful-Broni, A. (2004), "*Theory and practice of educational leadership in Ghana"*, Type Company Limited, Accra, Ghana.

Agarwal, B. (1992), "Gender relations and food security: Coping with seasonality, drought and famine in South Asia", In L. Benería and S. Feldman (Eds.), *Unequal burden: Economic crises, persistent poverty, and women's work,* Westview Press, Boulder, Colorado, pp. 374-378.

Beetham, D. (1992), "Liberal democracy and the limits of democratization", In Held, D. (Ed.), *Prospects for democracy: North, South, East, West,* Polity, Cambridge, pp 41.

Chachange, C.S.L. (1991), "*Rural water and sanitation programmes in Morogoro and Shinyanga regions: A study of women involvement in the implementation of the programme"*, Dar-es-Salaam University Press, Tanzania.

Coates, S. (1999), "A Gender and development approach to water, sanitation and hygiene programmes", *A Water Aid Briefing Paper*, Water Aid, United Kingdom, available at: http://www. wateraid.org/documents/a_gender_development_approachpdf (accessed 29 July, 2009).

Dikito-Wachtmeister, M.S. (2000), "*Women's participation in decision-making processes in rural water projects: Makoni District*", Ph.D. Thesis. University of Bradford, Zimbabwe.

Djegal, A., Price, M. and Acquaye, G.K. (1996), "*Evaluation mission report on rural water and sanitation programme, Eastern region of Ghana project GHA/88/017*. Unpublished Report. Accra, available at: http://www.jstor.org/stable/4030170 (accessed 18 June, 2009)

Dotse, M.F., Laryea, N.O. and Yankson, B. (1995), "Sustainability of water and sanitation systems: Can rural women manage water?*"* Paper presented at the 21st WEDC Conference, Kampala, Uganda.

Duncan, B.A. (1998), *Women in agriculture in Ghana,* Friedrich Ebert Stiftung, Accra.

Engel, S., Iskandarani, M. and Useche, M.P. (del.) (2005), "Improved water supply in the Ghanaian Volta basin: Who uses it and who participates in community decision-making?", *EPT Discussion Paper*, Vol. 129, pp. 1-47, Washington, DC: IFPRI.

Fournier, V. and Kelemen, M. (2001), "The crafting of community: Recoupling discourses of management and womanhood", *Gender, Work and Organisation,* Vol. 8 No.3, pp. 267-290. Retrieved June 12, 2009 from: http://www.jstor.org/stable/4030170.

Garande, T. and Dagg, S. (2005), "Public participation and effective water governance at the local level: A case study from a small under-developed area in Chile", *Environmental Development and Sustainability,* Vol. 7, pp. 417-431.

Gleitsmann, B.A., Kroma, M.M., and Steenhuis, T. (2007), "Analysis of a rural water supply project in three communities in Mali: Participation and sustainability", *Natural Resources Forum,* Vol. 31, pp. 142–150.

Hemson, D. (2002), "Women are weak when they are amongst men: Women's participation in rural water committees in South Africa", *Agenda,* Vol. 52, pp. 24-32.

IRC (1994), *Working with women and men on water and sanitation: An African field guide.* Occasional Paper Series 25. The Hague: IRC International Water and Sanitation Centre. Retrieved May 07, 2009 from: http://www.irc.nl/page/1858.

Kendie, S.B. (1994), '*Willingness to pay more for rural drinking water services in Ghana and Togo*'. Discussion Paper, 3, Cape Coast: University of Cape Coast, Centre for Development Studies.

Leach, M. (1992), "Gender and the environment: Traps and opportunities". *Development in Practice*, Vol. 2 No.1, pp. 12-21. Taylor & Francis Ltd., available at: http://www.jstor.org/stable/4029281 (accessed 18 June 2009).

March, C., Smyth, I. and Mukhopadyay, M. (1999), *A guide to gender analysis framework*, Oxfam publications, Great Britain.

Mbughuni, P. (1993), *Country gender analysis for Tanzania.* Paper prepared for Swedish International Development Cooperation Agency (SIDA).

Molyneux, M. (1985), "Mobilisation without emancipation? Women's interests, state and revolution in Nicaragua", In C. O. N. Moser, G*ender planning and development: Theory, practice and training*, Routledge, London and New York.

Moser, C.O.N. (1994), G*ender planning and development: Theory, practice and training*, Routledge, London and New York.

Mosse, D. (2001), "People's knowledge, participation and patronage: Operations and representations in rural development", In Cooke, B. and Kothari, U. (Eds.), *Participation: The New Tyranny?* Zed Books, London, pp. 24-35.

Narayan, P.D. (1995), *Designing community based development,* The World Bank, Washington D.C

Nwakeze, N.M. (2007), "The demand for children in Anambra State of Nigeria: A Logit Analysis", *Union for African Population Studies*, Vol. 22 No. 2, pp. 167-191.

Oheneba-Sakyi, Y., Awusabo-Asare, K., Abortsu, K. and Aryee, A. (1996), "*Female anatomy, decision-making and demographic behaviour among couples in Ghana",* Postdam, New York.

Opare, S. (2005), "Engaging women in community decision-making processes in rural Ghana: Problems and prospects", *Development in Practice*, Vol.15 No.1, pp. 90-99, Taylor & Francis Ltd. on behalf of Oxfam GB, available at: http://www.jstor.org/stable/4030170, (accessed 18 June 2009).

Pallant, J. (2007), *SPSS survival manual: A step by step guide to data analysis using SPSS for windows version 15* 3rd ed., Open University Press, Berkshire, England.

Saeed, H. (2003), "The gender agenda: Overburdening women in the name of gender equity?*Dawur",. The Newsletter of Water Aid Ghana Programme*, Vol. 6, Accra: Editions Services, available at: http://www.wateraidghana.org. (accessed 19 July 2009).

Sam, N.P. (2006), *Ghana: Gender integration in a rural water project in the Samari-Nkwanta community,* United Nations, New York.

Sampa, C.S. (1996), "The role of women in the management of rural water supply and sanitation projects: A case study of Keta district, Ghana", Unpublished Master's thesis, Kwame Nkrumah University of Science and Technology, Kumasi.

Sarantakos, S. (2005), *Social research* 3rd ed., Palgrave Macmillan, New York.

Simpson-Herbert, M. (1992), *Women and water*, WHO, Geneva, pp. 20-21.

Shahrashoub, R. and Miller, C. (1995), *From WID to GAD: Conceptual shifts in the women and development discourse*. Occasional Paper 1. UNRISD, Geneva, Switzerland.

SIDA (1994), *Towards a framework for including a gender perspective in water resources Management,* Development Assistance Committee Meeting on Water Resources Management, Paris, Stockholm.

Wijk-Sijbesma, C.A., van Mukherjee, N. and Gross, B. (2001), *Linking sustainability with demand, gender and poverty: A study in community-managed water supply projects in 15 countries,* International Water and Sanitation Reference Centre, Washington, D.C. and Delft.

World Bank (1989), *Operational issues paper on the forestry sector*, World Bank, Washington DC, USA.

World Bank (1991), *Water supply and sanitation in Africa: Laying the foundation for the 1990s*. Proceedings from the All Africa Rural Water Supply and Sanitation Workshop and Water Supply and Sanitation Conference (1 & 2), World Bank, Washington, DC.

Yelbert, J.E. (1999), "Integrated development for water supply and sanitation: Community management practices in Ghana", Paper presented at the WEDC 25th Conference in Addis Ababa, Ethiopia.