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Role of Intra-Household Water Management Practices in Transforming Water Resources Available for Agricultural Activities in Benue State, Nigeria

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Abstract

The study assessed the role of intra-household water management practices in transforming water resources available for agricultural activities in Benue State, Nigeria. Multistage sampling technique was used to select 160 respondents used for the study. Data were collected using interview schedule. Descriptive statistics were used in data analysis. Findings of the study showed that majority (67.8%) of the respondents indicated that women provided drinking water in their households; also majority (71.3%) indicated that women provided water for cooking and majority (66.1%) stated that women also provided water for laundry (66.1%), bathing (65.5%), and home cleaning (65.5%), while greater proportion (26.4%) indicated that boys were responsible for watering of livestock. The result showed that reducing the number of baths per household member (1.98), reducing the number of times dishes are wished per day (M=1.97), watering of gardens in the morning and evening only to reduce evaporation (1.95) gray water re-use (M=1.91), use of alum in purifying water (M=1.56), and use of water closet toilets (M=1.54) were among the water demand management strategies employed by households in the area. Strategies for improving water availability for households in the area include: participatory risk assessment involving local people and all other stakeholders (M=3.90), engaging the beneficiary community for which water provision is planned (M=3.88), encouraging local watershed management (M=3.88), mainstreaming gender in community water management (M=3.79) among others. It was recommended that gender mainstreaming in community water management be encourage so that both men and women will be involved in issues relating to water provision, policy and decision making for the development of water supply infrastructure.

Introduction

World water resources are already facing dramatic changes as a result of climate change, high water demands, population growth, industrialization and urbanization (Netherlands Water Partnership (NWP), 2007). It has been reported that 1.1 billion people worldwide do not have access to safe drinking water while 2.4 billion are without access to adequate sanitation (World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF), 2000). Water stress conditions (for instance the disappearance of Lake Chad) according to forecasts, will worsen by 2025, further increasing women and girl's burden of collecting and transporting water over long distances (International Water and Sanitation Centre (IRC), 2004). Increased incidence of drought in parts of Africa and Asia has been observed over the past decades and it is very likely that there will be an increased occurrence of heat waves over land in almost all parts of the world; and more frequent intense precipitation events in many regions (IPCC, 2001).

In Africa, observed temperatures have shown a general warming trend since 1960s, particularly in the last five years. Depending on the scenario used, annual mean surface air temperature for the period 2080-2099 is expected to increase between 3^0C and 4^0C compared with 1980-1999 period, with less warming in equatorial and coastal areas (Christensen, Hewitson, Basinoc and Chin, 2007). In Sub-Saharan Africa, long periods of drought are becoming more common and are predicted to become more widespread (WaterAid, 2007). Declines of 20%-40% in annual rainfall have been observed in West Africa since 1931 (Nicholson, Some and Kone, 2001), and of 2%-4% for the period 1960-1998 in the tropical rainforest zone (Malhi and Wright, 2004). Predictions of rainfall in future climate vary widely. However, studies have shown that mean annual rainfall is very likely to decrease by 20% in northern Africa by the end of the century, to increase by around 47% in tropical and eastern Africa (Christensen *et al.,* 2007).

Although Africa is generally considered as a continent endowed with abundant water, both urban and rural people in the continent lack adequate and safe drinking water and face food security risks, coupled with exposure to preventable water related diseases. Urama and Ozor (2011), stated that between 75 and 250 million people will be exposed to increased water stress due to climate change by 2020 in Africa and this will adversely affect livelihoods in the region.

In Nigeria like many other African countries, water resources for household uses are becoming increasingly scarce. Most rural communities are faced with challenges of sourcing for water which is being aggravated by climate change, poor infrastructure and poverty. In Daudu community in Guma Local Government Area of Benue State for instance, households now suffer from acute water scarcity due to a shorter rainy season, which has resulted in the drying out of streams and lowering of the water table. During dry season, women and children spend about three hours daily in search of water (http://www. Nigeria climate change.org/docs/ 2011/case_study_Greenwatch.pdf).

Most often, the responsibility of provision of water supply infrastructure are left within the domain of the government. This is because these infrastructures are very demanding in terms of financial involvement. A critical issue in this regard is that government with its top down approach does not involve the rural people who are the beneficiaries of water supply projects. An in-depth study of the rural organization shows that there are always designated role for each member of the household. The different gender of the household is a stakeholder in any water provision plan. Therefore for any meaningful transformation to take place in water provision projects, the different gender of the household should be involved. The relevant questions now are: what are the intra-household roles in water provision in the area? What are the household water demand management strategies in the area? What are the community water management strategies in the area? What the possible strategies for improving water availability for households in the area?

Objectives of the study

The overall purpose of the study was to determine the role of intra-household water management practices for transforming water resources available for agricultural (households) activities in Benue State, Nigeria. The specific objectives were to:

(i) identify the intra-household role in water provision for different household needs;
(ii) determine the household water demand management strategies;
(iii) ascertain the approaches to community water management in the area; and
(iv) ascertain possible strategies for improving water availability for households in the area.

Methodology

The study was carried out in Benue State. The state is located in the middle belt of Nigeria; between longitude 7°44'E and 9°55'E and between latitude 6°29'N and 8°7'N. All the households in Benue state constituted the population for the study. Multistage sampling technique was used to select the sample for the study. Benue State has 3 agricultural zones (Northern, Central and Eastern Zone). Northern and Eastern zones were randomly selected and two blocks (Kastina-Ala and Konshisha) were randomly selected from Eastern zone while two blocks (Gboko and Gwer-west) were randomly selected from the Northern zone giving a total of four blocks. In each block, two circles were randomly selected. Twenty households were randomly selected from the list of households in each circle giving a total of one hundred and sixty (160) households. However, only 156 copies of the interview schedule were well filled and used in the analysis. Respondents were asked to indicate their sex i.e male or female, age in years, marital status i.e single, married, divorced and widowed; and household size. Data on gender role in household water provision were gotten by asking respondents to indicate which gender was responsible for water provision for different uses in their household including drinking, cooking, laundry etc. Household water demand management strategies used were obtained by asking respondents to tick from a list of management options provided. The frequency of use of the options was also ascertained. Data were analyzed using percentage, mean scores and standard deviation.

Results and discussion

Table 1 shows that majority (61.5%) of the respondents were males. This shows that there were more male than female-headed households in the area. The mean age of the respondents was 46.1 years. This implies that the respondents were old enough to make rational decisions/contributions in issues regarding water provision. The results also show that majority (72.4%) of the respondents were married with a mean household size was 13 persons. This result shows that households in the area are quite large. The implication is that they could be finding the problem of water scarcity quite difficult to manage at the household level since increasing demand for water has been reported to be directly related to population growth (http://www.unfpa.org/rh/ planning/mediakit /docs /sheet3 .pdf).

Table 1: Percentage distribution of respondents according to socio-economic characteristics

Socio-Economic Characteristics	Percentage (%)	Mean M
Sex:		
Male	61.5	
Female	38.5	
Age		
1-20	7.0	
21-40	41.3	
41-60	28.4	46.1
61-80	16.8	
81 and above	6.5	
Marital status		
Single	16.7	
Married	72.4	
Widowed	9.6	
Divorced	1.3	
Educational level		
No formal education	28.8	
Primary school attempted	5.1	
Primary school completed	14.7	
Secondary school attempted	12.8	
Secondary school completed	18.6	
OND/NCE	14.1	
HND/first degree	4.5	
Higher degrees	1.3	
Religion		
Christianity	98.1	
Islam	0.6	
Traditional	1.3	
Household size		
1-5 persons	18	
6-10 persons	38	
11-15 persons	17.3	
16-20 person	14.7	
21 persons and above	12	
Estimated monthly household income(₦)		
≤ ₦5000	43.6	
₦ 5001-₦ 10,000	17.9	
₦ 10,0001-₦ 15,000	5.1	31703.7
₦ 15,001-₦ 20,000	10.3	
₦ 20,001 and above	23.1	

Intra-household role in household water provision

Table 2 shows that majority (67.8%) of the respondents indicated that women provided drinking water in their households; also majority (71.3%) indicated that women provided water for cooking. Also, majority (66.1%) stated that women provided water for laundry, bathing (65.5%), and home cleaning (65.5%). While greater proportion (26.4%) indicated that boys were responsible for watering of livestock.

On irrigation of farms, a large proportion (6.3%) indicated that women were responsible for the task while 2.9% of the respondents indicated that every gender in the household provided water for the household fish farms. Also, 4.6% of the respondents indicated that every gender in the household provided water for the household crafts.

These findings imply that actually there are gender role in provision of water for different household and agricultural uses in which women and girls dominated. The findings are in line with IRC (2004a) assertion that women and girls do most of the household tasks including water-related tasks and that women fetch water for livestock and home gardens that feed the family and/or provide income for the family. The implication of this is that women and girls bear most of the brunt of water scarcity, therefore should be targeted by any development agency that may be interested in bringing water and sanitation interventions in the area.

Table 2: Percentage distribution of respondents according to intra-household role in household water provision

Intra-household role in water provision for different purposes	Men	Women	Boys	Girls	Every gender
	%	%	%	%	%
Provision of household drinking water	6.3	67.8	14.9	18.4	5.7
Provision of household water for cooking	4.0	71.3	14.9	21.3	5.2
Provision of household water for laundry	4.0	66.1	17.2	18.4	6.3
Provision of household water for batting	5.2	65.5	17.8	18.4	6.3
Provision of household water for home cleaning	2.9	65.5	16.1	18.4	6.3
Watering of livestock	4.6	23.4	26.4	13.8	5.7
Irrigation of farms	1.7	6.3	2.9	2.9	5.2
Provision of water for household fish farms	1.1	1.1	2.3	0.6	2.9
Provision of water for household crafts	1.7	1.1	2.3	1.1	4.6

***Multiple responses**

Household water demand management strategies

Table 3 shows the mean distribution of respondents according to household water demand management strategies used. The data show that reducing the number of baths per household member (1.98), reducing the number of times dishes are wished per day (M=1.97).

watering of gardens in the morning and evening only to reduce evaporation (M=1.95), use of drought tolerant crops in home gardens (M=1.94), gray water re-use (M=1.91), use of alum in purifying water (M=1.56), and use of low flush toilets (M=1.54) were strategies used by respondents sometimes. However, only two variables namely, engaging in collective laundry for the household (M=2.03) and reducing the quantity of water used in bathing (M=2.03) were water demand management strategies frequently used by respondents in the area. This findings show that households had already devised some management strategies that help them make effective use of the available water resources and could be willing to partner with development agencies in water provision in area.

Table 3: Distribution of respondents by household water demand management strategies

Household water demand management strategies	Mean	Standard deviation
Surface water harvesting	1.11*	0.314
Improving underground water	1.10*	0.399
Checking for and reduction of wastage	1.10*	0.377
Boiling of drinking water	1.23*	0.480
Rainfall enhancement (e.g. engaging the services of rain makers)	1.05*	0.209
Use of drought tolerant crops in home gardens.	1.94**	0.289
Use of alum in purifying water	1.56**	0.559
Watering of gardens in the morning and evening only to reduce evaporation	1.95**	0.319
Use of water closet	1.54**	0.854
Gray water re-use	1.91**	0.330
Reducing the number of baths per household member	1.98**	0.212
Engaging in collective laundry for the household	2.03***	0.289
Reducing the quantity of water used in bathing	2.03***	0.264

*Not used, ** Sometimes used, ***Frequently used

Community water management approaches

Entries in table 4 show that eight (8) out of the thirteen variables were approaches used by the communities in water resources management. These variables include: construction of wells (97.4%), collective clearing of flora around water bodies (95.5%), regulating the period of water fetching by community members (93.6%), prohibition of cloth washing in certain parts of water bodies (93.5%), security watch over water source (92.9%), prohibition of bathing in streams (89.7%), prohibition of bush burning around water bodies (86.1%), prohibition of vegetable farming around water bodies (55.8%). During FGD in Jovkyundan community (Konshisha Block), the discussants asserted that because of the increase in the shortage of water and the early drying up of the steams, they now organize themselves and dig well right at the floor of the streams so that they can get water for the whole community. They stated that they dug three such wells in a stream, one for drinking, one for cooking and the other for other purposes like washing and bathing. Respondents also stated that they have vigilante group who guard the water sources and make sure that people adhere to rules guiding water fetching in the area. The findings are in line with Enwelu (2011) who stated that about 84% and 74% of the respondents in the entire watersheds studied in southeast Nigeria had rules of clearing of roads leading to the watersheds/rivers and washing/bathing at specific locations respectively. The implication of these findings is that involving the community for which water provision project is intended is very paramount in ensuring the sustainability of such projects.

Table 4: Percentage distribution of respondents according to community water management approaches

Community water management approaches	%
Security watch over water sources (e.g. using masquerades)	92.9*
Regulating the period of water fetching by community members	93.6*
Prohibition of tree felling around watersheds	30.5
Prohibition of sand mining in water bodies	3.9
Prohibition of fishing with chemicals	6.5
Prohibition of vegetable farming around water bodies	55.8*
Prohibition of bathing in streams	89.7*
Prohibition of fishing in some parts of water bodies	11.2
Prohibition of cloth washing in certain parts of water bodies	93.5*
Leak detection and repairs on taps	26.7
Collective clearing of flora around water bodies by community members	95.5*
Construction of dams to save water for scarce period	12.7
Construction of wells	97.4*
Prohibition of bush burning around water bodies	86.1*

* Used approaches

3.4. Strategies for improving water availability for households in the area

Entries in table 5 show the strategies for improving water availability for households in the area. The strategies include: participatory risk assessment involving local people and all other stakeholders (M=3.90), provision of water supply infrastructure such as pipe-borne water and boreholes (M=3.89), engaging the beneficiary community for which water provision is planned (M=3.88), encouraging local watershed management (M=3.88), mainstreaming gender in community water management (M=3.79) and avoiding gender bias in household water provision (M=3.77). The results also show that respondents agree to the fact that gender mainstreaming in community water management can improve adaptation to the impacts of climate change on water resources; and just as IRC (2004) noted that involving men and women in influential roles at all levels can hasten the achievement of sustainability in the management of scarce water resources.

The findings agree with IRC (1995) suggestions, that projects to supply drinking water, improve sanitation and protect drinking water resources should have more fundamental and developmental aims. They should not only improve local conditions and practices, but by the way they work with the people they also strengthen the latter's capabilities to bring about and preserve these changes, improve their living conditions and stimulate the undertaking of new development activities in their homes and communities.

Table 5: Strategies for ameliorating the impacts of climate change on water resources

Strategies for ameliorating the impacts of climate change on water resources	Mean	SD
Provision of water supply infrastructure such as pipe borne water	3.89*	0.448
Provision of new irrigation scheme and dams	3.86*	0.471
Engaging the beneficiary community for which water provision is planned	3.88*	0.484
Integrated water resources management	3.91*	0.383
Encouraging local watershed management	3.88*	0.415
Participatory risk assessment involving the local people and all other stakeholders	3.90*	0.414
Mainstreaming gender in community water management	3.79*	0.672
Modification of irrigation techniques	3.88*	0.381
Avoiding gender bias in household water provision	3.77*	0.699

Conclusion and Recommendation

The study assessed the role of intra-household water management practices in transforming water resources available for agricultural activities in Benue State, Nigeria. The findings revealed that majority of the respondents were male, married and had no formal education. The household water demand management strategies identified include: reducing the number of baths per household member, reducing the number of times dishes are wished per day, among others while community water management strategies identified include: construction of wells, collective clearing of flora around water bodies, regulating the period of water fetching by community members, etc. It was therefore recommended that gender mainstreaming in community water management be encourage so that both men and women are involved in issues relating to water provision, policy and decision making for the development of water supply infrastructure.

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