

WATER QUALITY, SUPPLY AND DEMAND AND ITS IMPACT ON FOOD SECURITY IN THE UPPER EAST REGION

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ABSTRACT

The study involved analysis of water samples from wells, boreholes and a dam in the proximity of areas in rural communities where food security programs are being or have been undertaken in the Kassena Nankana and Bawku West districts of the Upper East Region of Ghana. In addition, food security survey which included a social survey and detailed observation of anthropogenic activities were also made to determine the impact that water supply and demand has on food security and health of the people in the study area.

Results obtained from the analysis of water taken from indicated sources, gave temperature values ranging from a minimum of 22.6⁰C to a maximum of 32.8⁰C (mean =29.98⁰C); this met the Environmental Protection agency (EPA) - Ghana standards value of ± 2 of the ambient temperature of the area for drinking water with which there is no adverse health effect to humans. pH values ranged between 4.3 to 8.1 pH units. The minimum pH value did not meet the EPA standard values of 6.5-8.45 pH units and creates some health concerns. Minimum conductivity value recorded was 5.0 uS/cm to a maximum of 131.0 uS/cm (Mean=35.96 uS/cm), both confirmed to EPA standard range of 0 to 400 uS/cm for drinking water. Turbidity values ranged from 4.1 NTU to 70.2NTU (Mean=27.28NTU) and met EPA standard range of 0 to 50mg/l. Total dissolved solids (TDS) values ranged between 38.8 mg/l and 70.2 mg/l and therefore met the EPA approved range of > 400mg/l. Colour values ranged between a minimum of 3.9Hz and a maximum of 10.3 Hz which also met EPA safe range of >15Hz. Except dissolved oxygen (DO) whose values ranged from a minimum of 6.20mg/l to a maximum of 13.0mg/l and were above the EPA safe range of >5mg/l. Nitrate, Nitrite, Ammonia, Sulphate, Lead, Cadmium and Arsenic value range from a minimum of 0.0mg/l to a maximum of less than 0.25mg/l.

Not all the values recorded in the various sources met the EPA and WHO standards. No value was recorded for mercury. Bacteriology parameters counted ranged from 0.0cfu/100ml to 181.0cfu/100ml for faecal coliform and did not meet the EPA safe range of 0 for drinking water. Total coliform counts ranged from 2.0cfu/100ml to 181.0cfu/100ml and far exceeded the EPA and WHO safe range of 0 to 5 counts/100ml while others did not. Generally boreholes and dams had better water quality than wells. A combination of the results obtained, makes water from the hand dug wells in the study area not totally wholesome for domestic purposes but also create health concerns.

Food security survey and observations made indicated that, there were some water but not all-year round water supplies for domestic use due to the decline of water in the various sources during the dry season. In addition, most households (HH) have less food intake due to less food production and low purchasing power. The low food production was due to delay in rains, lack of alternative sources of water for planting all year round and excessive rain during the main farming season. The study also identified that most households had no alternative jobs, lack access to credit for farmers, use less inorganic fertilizer and more animal droppings as fertilizer; decline in food aid during the dry season, failure of household coping strategies, inadequate diet and low income from crop sold during the dry season also contributed to the food security. Positively most households had storage facilities (i.e. mud silos and improved mud silos), with communities also having good roads which could facilitate transportation of goods and services. Food security programs have had less impact in ensuring household food security. Socially, more than 90% of household do have access to toilet facilities except Paga Saaka which is benefiting from a food security program being implemented by the Adventist Development and Relief Agency (ADRA). Sanitation around water facilities and the communities as a whole was generally poor, giving rise to the prevalence of sanitation related diseases in the selected communities. Education on water and sanitation which is organised by Water and Sanitation Committees (WATSAN committees) in various communities and Environmental Health Officers from the District Assembly was least conducted therefore the education had less impact on the quality of water and sanitation in the selected communities. The combination of the above, indicated that household food security have not been achieved in any of the communities except Paga Saaka.

More than 75% of the respondents including residents in the communities, staff of Ministry of Food and Agriculture, selected non-governmental organizations and other institution surveyed, believed that water availability all year round is the appropriate and precise measure to ensure food security since vegetables and crops grown during the dry season have more market access and value for the farmers than the crops grown during the major farming season.

SUPERVISORS

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