



## ATTITUDE OF FARMERS TOWARDS ADOPTION OF RURAL WATER SANITARY PRACTICES AMONG FARMERS IN PLATEAU STATE NIGERIA

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### ABSTRACT

The study was conducted to determine attitude of farmers towards adoption of rural water sanitary practices among farmers in Plateau state Nigeria. Nigeria. A multistage sampling procedure was used to select sample size of 279. Data were collected using structured questionnaire and analyzed using descriptive statistics. Findings revealed that average household size was about 7 people with mean income of about ₦454, 000.00 per annum. The respondent attended formal education at various levels. It was further observed that, adoption of storage of water in clean containers had the highest adoption. On the attitudes of respondents to RUWASA recommended practices, findings revealed that only 30% of farmers generally had positive attitudes towards RUWASA recommended practice. This was precipitated by high percentage of people with RUWASA related diseases in the previous one-year, inadequate water usage, low percentage of people with appropriate hand washing behaviour and also low percentage of people with access to and proper use of toilets/latrines which were 30%, 37 lcd, 8% and 15% respectively against the international standards of 25%, 50Lcd 50% and 75% respectively for the same recommended practices. Based on the finding of this study, it was recommended that there is need for sustained efforts in educating farmers on the dangers of non-adherence to RUWASA recommended practices and also legislation in the local government council's by-laws is necessary to enforce compliance.

**Keywords:** Extension, Intervention, Social, Change, Water, Sanitation

### INTRODUCTION

At no other point in human history has there been as much concern with social change than in the present. Social change is occurring rapidly and with profound effects in many sectors of social life throughout the world. In most instances where change is not taking place or is taking place only slowly there is often great concern about how to stimulate change. The social change is the major challenge to agricultural extension in the early 21st century to derive, on the one hand, from the challenges that farmers and agriculture face in view of their ever-changing social and natural environment, and, on the other hand, from the changes that emerge within extension organization themselves. In line with 'social change' thinking, there was great concern in the 1950 to 1970 period with the 'adoption and diffusion' of science-based innovations (Dearing, J & S, Lee, 2016). Extension scientists developed an interest in adoption decisions. In the context of diffusion, it was also recognized that farmers could gain a lot from each other's knowledge and experience (regarding new technologies, among other topics) when solving agricultural problems (Rohilla, S. & Kumar, R. (2024). Inspired by such interests and insights, the emphasis in definitions of extension shifted slightly from 'education' to supporting decision making and/or problem solving. This brought the contention that 'Agricultural extension provide assistance to farmers to help them to identify and analyse their production problems and to become aware of the opportunities for improvement.

Extension is helping behaviour consisting of – or preceding – the transfer of information, usually with the explicit intention of changing mentality and behaviour in a direction that has been formulated in a wider policy context. Extension is a professional communication intervention deployed by an institution to induce change in a voluntary behaviour with a presumed public or collective utility' (Leeuwis. & van den Ban, 2004) The phrase added by Leeuwis. & van den Ban on 'presumed public or collective utility' is important, because it was used to distinguish extension from other forms of communication intervention such as: commercial advertising, where the goal is to sell products in the



interest of a limited group (salesmen, shareholders); political propaganda, where the goal is to influence social system's ideological beliefs and/or perceptions of reality in order for some to gain or maintain power, public relations, where the goal is to manage one's own reputation or public image. From a purely descriptive point of view, the definition of extension would be something like; 'Extension is everything that people who think of themselves as extensionists do as part of their professional practice.' Different people may have different ideas about what is a challenge for agricultural sectors and/or extension. Some of the challenges that face today's agriculture have been within the social system for a long time, while others have arisen more recently (Rohilla, & Kumar, 2024). According to estimations by the World Bank (World Bank, 2020) there are some 1000 million economically active people worldwide whose livelihood depends at least in part on subsistence and/or commercial farming. The majority of these have incomes of less than one US dollar a day. For the improvement of their livelihood these people depend directly or indirectly on agricultural development –directly, in the sense that agricultural development may allow them to have a higher income from farming, and indirectly since agricultural development is widely regarded as an important trigger and condition for non-agricultural economic growth (IFAD, 2019). Extension is therefore, attempt to provide a deliberate and systematic means to transfer knowledge and insight in order to help and/or develop someone in such a way that the person is able to take decisions in a specific situation with a maximum level of independence, consciousness, and conformity with his own interest and wellbeing.' (Van Gent and Katus, 1980). It involves the conscious use of communication of information to help people form sound opinions and make good decisions.' Leeuwis & van den Ban, 2004).

This study was guided by the social change theory, which in the context of the social system as it involves in the alteration in the system or systemic attributes in social system. It is perhaps significant to note that many of the rural poor see little future in agriculture (Farrington *et al.*, 2002), and would like to see their children get a good education and not become farmers. In some regions agriculture is increasingly looked upon as a 'last resort' activity i.e. as something one does if everything else fails. With this cultural outlook on agriculture, it will be difficult to meet any of the challenges mentioned because few may be willing to make a real investment, and many capable people may prefer to leave the sector. Thus, an additional challenge for farmers may in some cases be to improve its own credibility and image as a promising and valuable economic sector.

Across the world, agriculture has been criticized sharply for its detrimental effects on the natural environment and the world ecology at large. Soil degradation, erosion, excessive use of chemicals, waste of water, decreasing ground water tables, destruction of natural habitats for wildlife, water pollution and limited animal welfare are just a few of the concerns raised by environmentalists, ecologists, nature conservationists and the public at large. This had led to a call for agriculture to become less exploitative and more 'sustainable', which means that agriculture will have to be carried out to make the best use of available natural resources and inputs, and regenerate conditions for future production (soil fertility, resilience of the ecosystem, water availability). There are different schools of thought on the precise technical, social, economic and ethical criteria and characteristics that should be used to assess and describe the 'sustainability' of agriculture. For some, sustainable agriculture means agriculture with low external input, while others argue that this kind of agriculture is unsustainable since it requires a large increase in cultivated area, and that the use of fertilizers and high-tech machinery can also be sustainable. But the bottom line depends on the social change which include among others; change in ideas, values, norms attitudes, environment, obligations, social roles and life goals. Various farming systems have been coined, such as integrated agriculture, ecological agriculture, organic agriculture, biological agriculture, permaculture and precision agriculture. Regardless of one's convictions, sustainable agriculture and natural resource management represent important challenges for primary agriculture, agro-industries and service institutions.

As several authors have pointed out (Edward and Burgess, 2021) 'sustainability' cannot just be looked at in biophysical or ecological terms, because the state of 'hard systems' depends crucially on interactions between multiple human beings (i.e. on the 'soft system'). When knowledge is limited to 'agro-technical' knowledge, there some issues that arise. Although there may be disagreement over the precise meaning of the term 'sustainable', it is self-evident that such types of agriculture require farmers



to manage and co-ordinate ecological processes and cycles carefully. In crop-protection, for example, it is no longer sufficient merely to apply a number of preventive sprays according to a standard recipe. Instead, a balance must be maintained between pests and their natural predators, and keeping the ecosystems in which, the latter exist. The management of this kind of balance requires that farmers have a good behavioural change which include favourable change in the knowledge, skills and attitudes of the people in the social systems about the complex ecological processes and interconnections, and at the same time that they can anticipate the inherent unpredictability of such systems (Dominik, 2021). A second feature that seems to be important is that, especially with low external input, sustainable agrarian practices will probably need to be more varied than conventional practices such as the Rural Water and Sanitation practices (RUWASA) recommended practices. The broad objective of this study was to determine attitude of farmers towards adoption of rural water sanitary practices among farmers in Plateau State Nigeria. The specific objectives were to:

- i. determine the level adoption of water and sanitation recommended practices by farmers in rural Plateau State;
- ii. identify and describe the attitude of rural farmers with regards to water and sanitation recommended practices;
- iii. compare the current standards of water and sanitation in rural Plateau State with the International Standards;
- iv. identify and describe the constraints in the adoption of water and sanitation recommended practices.

## **MATERIALS AND METHODS**

### **The Study Area**

The study area was Plateau State, Nigeria, located between Latitude 8° 22' and 10° 24' North and Longitude 8° 32' and 10° 38' East and has a total land area of 26,901 square kilometres. The State is positioned in the center of Nigeria. It is bounded on the Northwest by Kaduna State, Northeast by Bauchi State, the Eastern part by Taraba State and the Southern part by Nasarawa State. The state is administratively organised into 17 Local Government Areas (LGAs) namely Barkin Ladi, Bassa, Bokkos, Jos East, Jos North, Jos South, Kanam, Kanke, Langtang North, Langtang South, Mangu, Mikang, Pankshin, Qua'an Pan, Riyom, Shendam and comprises of 207 Federal wards. Agriculture is the main economic activity and major crops cultivated include maize, millet, rice, acha (Fonio), irish potatoes, and fruits and vegetables. The National population census of 2006 put Plateau State at 4,78,467 people. At 2.4% growth rate projection, by 2025 according to the 2006 census figures, and about 60 % of the population in Plateau State live in rural areas.

### **Sampling Procedures and Sample Size**

Plateau State is divided into three geo-political zones namely: Northern, Central and Southern zones. Samples of farmers were drawn from each of these zones. A multi-stage sampling technique was adopted. First, 9 LGAs out of the 17 LGAs in the three geopolitical zones were purposively selected based on the presence of RUWASA intervention on recommended practices. Secondly, 30 wards out of 99 wards representing 30 per cent from the 9 LGAs selected were purposively selected based on how much these areas had received RUWASA interventions and only wards or areas which qualified as rural and with RUWASA interventions were selected as follows: Jos East (3wards), Riyom (3 wards), Bokkos (4 wards), Pankshin (4 wards), Kanke (3 wards), Langtang South (3wards), Mikang (3 wards) Quan'anpan (3 wards) and Wase (4 wards). It should be noted that the selection of only two LGAs in the northern zone out of 6 LGAs is because 2 LGAs are urban (Jos North and Jos South) leaving 4 that have rural areas. Third, 15 percent of a total of 1860 farm households were randomly selected using systematic sampling method, employing table of random figures. Therefore, 279 household heads served as respondents.

### **Method of Data Collection**

The relevant data for this study were collected from primary sources. From these sources, data were collected from household heads of farm families in the selected rural communities using a questionnaire instrument. Fifteen Village extension workers with Diploma-level training in agriculture



who were also conversant with the local languages of the respondents undertook an intensive one-day training session on data collection techniques prior to the survey. Each of the extension workers administered the questionnaire to eighteen respondents and the researcher administered it to nine respondents, giving a total of 279 respondents.

### **Analytical Techniques**

Descriptive statistics is the discipline of quantitatively describing the main features of a collection of data. Descriptive statistics are distinguished from inferential statistics (inductive statistics) in that descriptive statistics aim to summarize a sample, rather than use the data to learn about the population that the sample of data is thought to represent. This generally means that descriptive statistics, unlike inferential statistics, are not developed on the basis of probability theory. Even when inferential statistics is used mainly in analyzing a particular data to draw conclusions, descriptive statistics are usually also presented alongside. Descriptive statistics is also a set of brief descriptive coefficients that summarizes a given data set, which can either be a representation of the entire population or a sample. The measures used to describe the data set are measures of central tendency and measures of variability or dispersion. Measures of central tendency include the mean, median and mode while measures of variability include the standard deviation (or variance), the minimum and maximum variables, kurtosis and skewness.

Attitudes were measured by asking respondents to react to a number of statements about their affinities for, and aversions to, water and sanitation recommended practices using the Likert scale. In this study the 5-point Likert scale type was used to measure the respondents' attitudes towards adoption of **RUWASA** recommended practices with 5,4,3,2 and 1 scores for strongly agreed, agreed, uncertain, disagreed and strongly disagree to positive statements. This scoring was reversed for negative statements about the **RUWASA** recommended practices. To minimize possible "response sets", approximately half of the statements were favourable, and the other half consisted of unfavourable statements about adoption of **RUWASA** recommended practices.

The overall percentage attitude of respondents towards **RUWASA** recommended practice was calculated thus:

$$\frac{\text{Frequency of respondents } (-ve \text{ or } +ve) \text{ response multiplied by response score} \times 100}{\sum \text{respondents multiplied by maximum score of 5 (strongly agree)}}$$

Where:

% = percentage

$\sum$  = summation

## **RESULTS AND DISCUSSION**

### **Socio-economic Characteristics of the Respondents**

Table 1 summarizes the socio-economic characteristics of respondents. The result indicates the mean age of respondents was 46.05 years implying that majority of the respondents were middle aged people. Having a population that is middle aged suggests that understanding water and sanitation recommended practices would be easier since most middleaged people are expected to have had at least the minimum level of formal education and are likely to be more curious in trying new ways of handling hygiene issues. Results further revealed household size had a mean of 6.56. This finding is in agreement with Ekong, 2010 who stated that 70 % of some rural states in Northern Nigeria had 5-7 persons per household, which he considered as large size. The finding in this study therefore also suggests that the people had large household sizes in the study area. This implies more pressure on **RUWASA** facilities in households which increases lack of compliance where such facilities are insufficient. The mean income of respondents was N297, 000.64 per annum. A calculation using an average household size of 7 people in study area would mean each member in a household lives on N116.24 per day! Those farmers were low income earners might be the reason for low adoption of **RUWASA** recommended practices due to inability to afford **RUWASA** facilities like soap and detergents, disinfectants, dig wells, build latrines etc.



Furthermore, results showed a mean farm size of 1.02 hectares among respondents, implying that respondents were small scale farmers. This finding is in agreement with Ekong, (2010) that most Nigerian farms are small-size family farms in which family members contribute the required labour. The implication of small scale farming is that it hardly gives yields beyond the level needed to keep the family hence, less income from sales of excess. Small incomes mean that farmers are poor and may have problems with affording RUWASA facilities, hence low adoption. Results further show that the mean years of formal schooling was 8.5years, implying that respondents had low educational levels, results suggests that respondents barely attended the primary school level of education. With this low educational level, the implication is that respondents hardly appreciated the *RUWASA* recommended practices.

From the results, membership of social organization had a mean of 1.45 suggesting that most respondents in the area studied belonged to only one social organization. The low membership of social organizations by respondents suggests that they were not much exposed to education on *RUWASA* practices generally since it is expected that the more a person belonged to different social organizations the more his chances of getting information and education on different issues discussed during meetings of the organizations. The implication of this finding is that low membership of social organization by farmers could be the reason for low adoption found in the study. This finding agrees with that of Geling (2025) who found that farmers that belonged to many social organizations tended to have more access to information which facilitated their adoption decisions. Table 2 further showed that the mean of formal sources of information to respondents on *RUWASA* activities is 3.29 suggesting that there were adequate channels of communication of *RUWASA* recommended practices hence, the high levels of awareness revealed in the results which was expected to lead to increase in adoption but did not. This finding ran contrary with that of Dominik, (2021) who indicated that, provided a technology is profitable, increased information induces adoption.

**Table 1: Distribution of Respondents by their Socio-economic Characteristics**

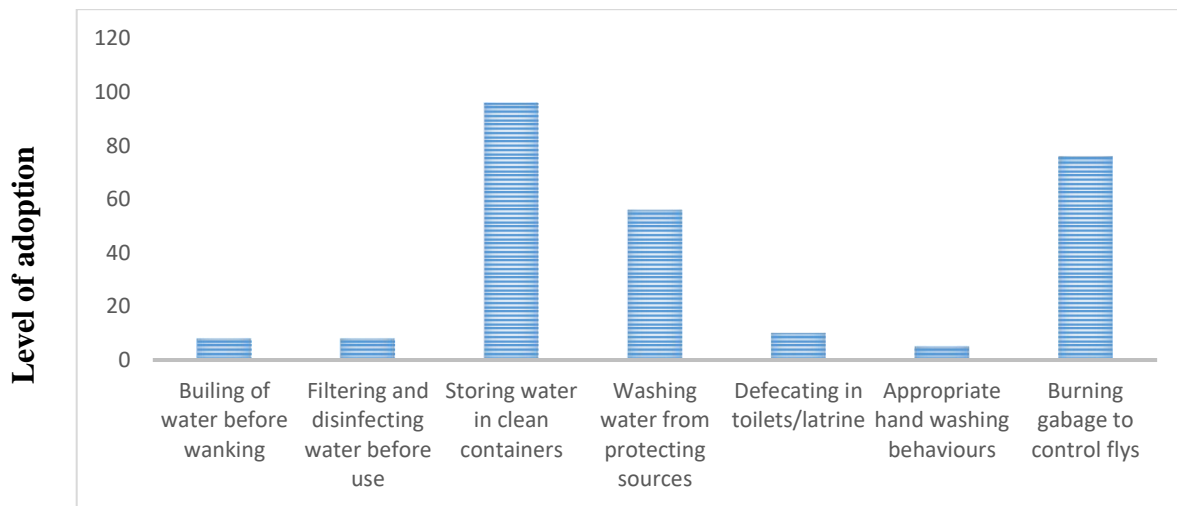
Variable	Minimum	Maximum	Mean	SD	SE
Age (yrs)	20	74	46.5	11.6	0.668
H/hold size(no)	1	30	6.56	4.99	0.299
Income (₦)	50000	2,050,000	454,430	297,000.64	17783.47
Farm size(ha)	0.1	5.0	1.02	1.13	0.068
Years of farming	0	24	8.50	6.55	0.392
Membership of social orgs (no)	0	5	1.48	1.15	0.069
No. of <i>RUWASA</i> extension contacts (no)	0	4	3.67	2.14	0.128
Sources of information	1	7	3.29	1.57	0.094

**Source:** Field survey 2020

### **Levels of and Adoption of *RUWASA* Recommended Practices**

Figure 1 shows that a percent of respondents identified boiling of water before drinking, filtering and disinfecting water before drinking, storage of water in clean containers, collection of water from protected sources (wells and springs), defecating in toilets/latrines, appropriate hand washing behaviours and burning of garbage around surroundings to prevent flies, as *RUWASA* recommended practices. The Figure shows the distribution of farmers by levels of adoption of *RUWASA* recommended practices. Findings show that 96 per cent, 70 per cent and another 56 per cent, adopted storage of water in clean containers, burning of garbage to control flies, collection of water from

protected wells and springs respectively. These results were higher and differed from the 4 per cent, 12 per cent and another 12 per cent respectively found by WaterAid (2004) for the same recommended practices. This implies that respondents did not find any problems with adopting these practices probably because they were easy to practice and had no cost implication. Moreover, these practices conformed to existing tradition and cultures of hygiene in the area. Results further revealed that 10 per cent, 8 per cent, another 8 per cent, and 5 per cent adopted defecating in toilets/latrines, appropriate hand washing behaviours, boiling of water before drinking and filtering and disinfecting of water before drinking respectively. These results were lower and differed from the 33 per cent, 12 per cent, 52 per cent and 2 per cent found respectively by WaterAid (2004). This result implies that respondents had problem adopting these practices. Probable reasons for this result could be attributable to the cost of soap, and even when ash is used, the cumbersomeness of practice might be a good explanation to its lack of adoption. The farmer needs to be moving with hand washing materials wherever he goes because he can never tell when he will be defecating or urinating and where the need will arise. Also, the cost of disinfectants and cumbersomeness of boiling water before drinking are other possible reasons for low adoptions.



**RUWASA recommended practices-**

**Figure 1:** A Graphic Representation of Levels of Adoption of RWASA Recommended Practices  
**Source:** Field survey 2020

### Attitudes of Farmers to RWASA Recommended Practices

The second objective of this study was to identify and describe the attitudes of rural farmers towards **RUWASA** recommended practices. Results in Table 2 show the distribution of respondents' attitudes towards **RUWASA** recommended practices. In the Table, out of a total of 279 respondents, 30 % had positive attitudes towards **RUWASA** recommended practices. The percentage distribution of respondents with positive attitudes towards **RUWASA** recommended practices is given as follows: majority of respondents had positive attitudes towards storing water in clean containers (78%), collection of water from protected sources (51%) and burning garbage to control flies (56%) leading to high adoption levels in these practices. Results show further that out of 279 respondents, 64% had negative attitudes towards **RUWASA** recommended practices. Specifically, percentage distribution of respondents is given as follows: boiling of water before drinking (85%), defecating in the toilets/latrines (88%), appropriate hand washing behaviours (73%) and filtering and disinfecting water before use (79%) leading to low levels of adoption of these practices. About 6% of respondents were undecided on their attitudes to the practices. This finding agrees with that of DWAF (2001) that people in developing countries generally have negative attitudes towards safe water and sanitation practices. The implication of having high percentage of farmers with negative attitudes is low adoption which results



in farmers continuing with their unhygienic practices leading to high incidences of water and sanitation related diseases in study area.

**Table 2:** Distribution of Respondents by Attitudes to *RUWASA* Recommended Practices

Statements on <i>RUWASA</i> Recommended Practices	Respondents Attitudes					
	Positive freq.	%	Undecided freq.	%	Negative freq.	%
Boiling of water before drinking kills germs	18	7	23	8	238	85
Filtering and disinfecting water before use is not necessary	12	5	7	16	26	79
Storing water in clean containers prevents disease build-up	217	78	8	3	54	19
Fetching water from protected sources is not mandatory	141	51	6	5	132	44
Defecating in latrines is not as comfortable as in the open	21	8	12	43	246	88
Appropriate hand washing behavior is good hygiene practice	20	8	54	19	205	73
Burning garbage to kill flies will lead to fire outbreak	151	56	18	6	110	38
<b>Mean</b>		<b>29.70</b>		<b>6.55</b>		<b>63.75</b>

Source Field survey 2020

### Current Standards of Sanitation in Rural Areas of Plateau State Compared to International Standard

The fourth objective was to compare current standards of *RUWASA* recommended practices international standards. In Table 4 results show that 30% of respondents had had *RUWASA* related diseases such as bilharziasis, typhoid, diarrhea, malaria etc, in their household in the previous year. The 30% status is above the acceptable limit of 25% International standard Aziz *et al* (1990). This finding suggests that the low adoption of *RUWASA* recommended practices is responsible for the high incidences of water and sanitation related diseases in farmers' households. Water usage in litres per capita per day (lcd)- the quantity of water used in the household for cooking, drinking, bathing and food preparation in a day was 36.9 lcd. This value is below the International standard of 50lcd. This finding means that water used in farmers' households is insufficient to maintain good hygiene and thereby favouring disease development. The results further showed that only 8% of respondents practiced appropriate hand washing behaviour in a household suggesting noncompliance to the practice. This percentage is far too low compared to the International acceptable limit of practice of at least 50% of members of a household having appropriate hand washing behaviour (Bateman & Smith, 1995). Only



15% of households in survey had access to and used toilets/latrines against the 75% international standard recommended by Bateman and Smith (1995). This means that almost all farmers' household members in the area passed their excreta in the open providing favourable conditions for pathogens build up which is the cause of the high incidences of water related diseases recorded in the area.

These generally low standards of **RUWASA** indicators found in the study area imply that the practice of **RUWASA** in rural Plateau was low and falls below the internationally acceptable standards. This could possibly be responsible for the high incidences of water and sanitation diseases in rural areas of Plateau State.

**Table 3: Standards of RUWASA in Study Area against the International Standards**

<b>RUWASA performance indicators</b>	<b>Recommended international standards</b>	<b>Standards in rural Plateau State</b>	<b>Differentials</b>
People with RUWASA related diseases	<25%	30%	5%
Water usage	50lcd	36.9lcd	-13.11cd
People with appropriate hand washing behavior	50%	8%	-42

**Constraints to the Adoption of RUWASA Recommended Practice.**

Table 4 shows the distribution of respondents by their responses on what they perceived as the problems they had in adopting the **RUWASA** recommended practices introduced to them. These problems were ranked and the results found revealed that bad habits towards hygiene ranked first as indicated by 93.9% of respondents. This means that despite the knowledge on **RUWASA** best practices, farmers' bad habits prevented them from adopting the recommended practices. Habits are usually difficult to change. Until some form of legislation is put in place to enforce compliance, it would be difficult to change these bad habits. This was followed by misleading perceptions about **RUWASA** recommended practices (89.2%). Result suggest that farmers do not see **RUWASA** recommended practices as any serious thing as they hardly can link their illnesses to the way they use water or how they maintain hygiene. They have a simplistic view of the issue of **RUWASA** which is misleading. There would be need for video/cinema show on documentaries of people who suffered from **RUWASA** related diseases elsewhere in community town halls for farmers to appreciate the gravity of not complying with **RUWASA** recommended practices. This was followed by low incomes (87.8%). Result mean that even when a farmer is willing to adopt all the **RUWASA** recommended practices, he might be challenged by lack of money to buy facilities like soap, disinfectants, build toilets, fuel. Poor living conditions were the next constraint to adoption (85.3%). This result suggests that the living conditions which are often overcrowded and without facilities makes it difficult for a farmer who might be willing to adopt recommended practices to do so. Suspicion and lack of trust of **RUWASA** advocators (70.25 per cent) was also found to be a barrier to adoption of **RUWASA** recommended practices. This finding means that farmers do not have trust on advocators of this programme. This is not surprising since advocators do not come with any reasonable incentive to show commitment to the programmes, rather they come with big cars and earn huge allowances, and this does not go down well with farmers. Negative cultural beliefs (65.9%) also constituted a challenge to adoption as most farmers were tight to their cultural believes that Africans are resistant to diseases, and lastly unemployment (59.8%) Without employment source of income is affected and affordability of **RUWASA** facilities is challenged. From the results found, it can be concluded that bad habits towards **RUWASA** constituted the biggest constraint in the adoption of the **RUWASA** recommended practices introduced in the study area. Other major problems of importance included, misleading perception of **RUWASA** recommended practices, low incomes and poor living conditions of respondents.



**Table 4:** Distribution of Respondents by Constraints to Adoption of RUWASA Recommended Practices

<b>Constraints to the Adoption of RUWASA Recommended Practices</b>	<b>Frequency</b>	<b>Percent</b>	<b>Ranking</b>
Bad habits towards hygiene	262	93.90	1 <sup>st</sup>
Misleading perceptions about RUWASA practices	249	89.25	2 <sup>nd</sup>
Low incomes	245	87.81	3 <sup>rd</sup>
Poor living conditions	238	85.30	4 <sup>th</sup>
Suspicion and lack of trust of RUWASA agents	196	70.25	5 <sup>th</sup>
Negative cultural beliefs	184	65.95	6 <sup>th</sup>
Unemployment	167	59.86	7 <sup>th</sup>

**Source:** Field survey 2020

### CONCLUSION AND RECOMMENDATION

Results showed that farmers were aware of the seven RUWASA recommended practices introduced to them and that some of the recommended practices had high adoption. These were, storage of water in clean containers, burning of garbage to control flies and fetching of water from protected sources. However, some of the recommended practices had very low adoption. These were filtering and disinfecting water at point of use, boiling of water before drinking, defecating in the toilet. The low levels of adoption found with these practices implied that despite the high levels of awareness on these practices, they were other important factors hindering adoption. Farmers generally had negative attitude towards RUWASA recommended practices. Findings revealed that adoption of RUWASA recommended practices was perceived by farmers as having some positive effects on them. Bad habits towards RUWASA practices, low incomes, poor living conditions and suspicion of RUWASA advocators by farmers were important constraints to adoption of RUWASA recommended practices. The study concludes based on the findings that only 30% of farmers had positive attitude towards RUWASA recommended practices hence low levels of adoption. The environmental health workers should be strengthened to enforce sanctions on non-compliance with adoption of RUWASA recommended practices. This can be done through legislation in the local government council's by-laws. Formal sources of information are a determinant of adoption of RUWASA recommended practice, so concerted efforts should be made by RUWASA stakeholders to sustain this channel of sensitization.

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