



CONTRIBUTED PAPER

Stakeholders' willingness and motivations to support sustainable water resources management: Insights from a Ghanaian study

Murat Okumah¹ | Ata S. Yeboah² | Owusu Amponsah²¹Sustainability Research Institute, University of Leeds, UK²Faculty of Built Environment, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana**Correspondence**Ata S. Yeboah, Faculty of Built Environment, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.
Email: ata.yeboah@yahoo.com**Abstract**

There is evidence that stakeholders' willingness and motivations to support sustainable river management strategies plays a crucial role in the success of water management policies. Earlier works have highlighted some of the drivers of stakeholders' willingness, however, the generalizability of much published research on this issue is problematic given that much of the research focuses on the Global North. By conducting in-depth interviews and applying content analysis, this paper aimed at exploring stakeholders' willingness and motivations to support sustainable water resource management as well as what stakeholders would do to support sustainable management of water resources. Results show that stakeholders appear to be willing to support water protection measures due to a wide range of motivations. Therefore, policymakers may need to emphasize those motivations when encouraging the public and/or segments of the society to engage in sustainable water resource management practices.

KEYWORDS

community engagement, Ghana, pro-environmental behavior, stakeholder motivations, sustainable water resources management, water pollution, Wenchi

1 | INTRODUCTION

Water resource pollution remains a major socio-ecological problem despite several decades of research and financial investment aimed at mitigating the problem (Hutchins, 2012; Novotny, 2013; OECD, 2017). A study in Tuguegaroa City, Philippines by Amponin, Bennagen, Hess, and Dela Cruz (2007) predicts that the rapid deterioration of water resources coupled with the rising demand for water is likely to result in limited water supply and thus increased cost of available water. Policies have thus been developed to mitigate the socio-ecological and

economic problems emanating from water resource pollution. However, data from several studies suggest that these policies have so far failed to make substantial progress in improving water quality (Kay et al., 2012; OECD, 2017; Okumah, Chapman, et al., 2019). This has been attributed to the narrow and regulatory nature of existing policies thus failing to address the complex factors resulting in water pollution (Duckett, Feliciano, Martin-Ortega, & Munoz-Rojas, 2016; Patterson, Smith, & Bellamy, 2013).

Recent studies have pointed out complex factors such as lack of ascription to self (Macgregor & Warren, 2006;

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2020 The Authors. Conservation Science and Practice published by Wiley Periodicals, Inc. on behalf of Society for Conservation Biology

Novo, Martin-Ortega, & Holstead, 2015), cultural and normative aspects (Okumah, Chapman, et al., 2019; Okumah, Yeboah, et al., 2019), uncertainty surrounding scientific evidence and lack of stakeholder awareness (Barnes, Willock, Hall, & Toma, 2009; Novo et al., 2015; Okumah, Martin-Ortega, & Novo, 2018; Vrain & Lovett, 2016) as partly responsible for minimal progress. Undoubtedly, most of these factors influence stakeholders' behaviors in relation to water resources pollution and management. Consequently, efforts to address water pollution have increasingly focused on encouraging uptake of pro-environmental behaviors (Blackstock, Ingram, Burton, Brown, & Slee, 2010; OECD, 2017). This has given rise to a substantial volume of research output that seeks to examine the drivers of behaviors in relation to land and water resources management (Barnes et al., 2009; Cobbinah, 2015; Daxini et al., 2018; Inman et al., 2018; Okumah et al., 2018; Okumah, Yeboah, et al., 2019; Yoder, Ward, Dalrymple, Spak, & Lave, 2019). Indeed, whether people adopt pro-environmental behaviors or not, and the extent to which water policies succeed in improving water quality depends on stakeholders' willingness to support sustainable river management strategies (Bengston, 1994; Mcfarlane & Boxall, 2000), thus, highlighting the need to examine stakeholders' willingness and motivations to support water protection.

The need to understand stakeholders' willingness and motivations to support water protection has contributed to a considerable volume of research exploring the topic. However, the generalizability of much published research on this issue is problematic given that much of the research focuses on the Global North (Chen & Jim, 2010; Pearson, Coggan, Proctor, & Smith, 2010; Ryan, Erickson, & De Young, 2003). Evidence suggests that cultural and contextual factors influence perceptions regarding water resources management, (de França Doria, 2010) therefore, extrapolating results from different socio-economic and cultural settings may result in greater uncertainty in applying research findings in policy design and implementation (Deasy et al., 2010; Okumah, Chapman, et al., 2019). Furthermore, studies exploring the topic mostly apply quantitative methods to establish stakeholders' willingness to pay for water protection interventions (Shang, Che, Yang, & Jiang, 2012). Such methods are useful in providing composite or single values for generalizations and policy purposes but often fail to provide deep and rich data needed to understand people's motivations and their "meanings" (Sieber, 1973; Wichmann & Köbbing, 2015).

To address these knowledge gaps, we apply qualitative techniques to examine community stakeholders' willingness and motivations to support water resource management. Specifically, the research relies on in-depth

stakeholder interviews and applies content analysis to answer the following: (a) Are stakeholders willing to support water resource protection? (b) What are the motivations of stakeholders to support water resource management? and (c) What can stakeholders do to support water resource management?

2 | OVERVIEW OF THE LITERATURE ON STAKEHOLDERS' WILLINGNESS TO SUPPORT WATER RESOURCE MANAGEMENT

Stakeholders' willingness to support water resource protection has been reported in several scholarly works. For example, Hamilton (1985a) found that several communities in New England had expressed enormous concerns about the rate of water contamination with the highest concerns reported among the young, women, and persons living at home. These concerns make them willing to initiate and support environmental protection efforts. A similar study by Hamilton (1985b) suggests that persons from wealthy family backgrounds, young and relatively new residents were more willing to support water resource management (see also Edwards, 1988). Epstein, Brown, and Pope (1982) suggest that local stakeholders with broader knowledge of and concerns about environmental problems are more willing to support water protection. From the foregoing, it may be concluded that socio-demographic characteristics may influence stakeholders' willingness and motivation to support water resource protection.

Further evidence on stakeholder willingness and motivations suggests that willingness to support initiatives aimed at water quality improvements may be attributed to the expected benefits of such interventions. For instance, Kohlmann, Mitsch, & Hansen (2008) and Buijs (2009) have found that local people's motivation to support water resource management has increased considerably with the broad realization of the aesthetic, ecological and socio-environmental roles of water resources (see also Bateman, Cole, Georgiou, & Hadley, 2006; Carson & Mitchell, 1993; Desvousges, Smith, & Fisher, 1987; Gürlük, 2006; Hoelting, Hard, Christie, & Pollnac, 2013; Jiang, Jin, & Lin, 2011; Loomis, Kent, Strange, Fausch, & Covich, 2000; Van Der Heide, Van Der Bergh, Van Ierland, & Nunes, 2008).

A handful of scholarly works have reported on the specific actions that stakeholders intend to take up to protect water resources. For instance, Osteen, Gottlieb, and Vasavada (2012) reports that farmers seek to protect water resources by consciously reducing pollutant emissions into water resources, thereby improving the quality of water. Osteen, Gottlieb, and Vasavada (2012) further

suggest that farmers aim to improve water quality by mitigating the effects of runoff and efficiently managing the discharge of agricultural-related chemicals into the rivers. Ryan et al. (2003) found that stakeholders have a range of management practices to offer to enhance water resource protection in riparian zones in Mid-western watersheds. These management practices include keeping a long grass of buffer along water resources, maintaining vegetation cover of shrubs and trees around water resources, cleaning out rubbish and planting trees and shrubs along water resources. These studies offer insights into the multiple sources of water pollution and potential solutions to the problem.

Although lessons could be drawn from these studies, the extent to which their findings could be applied to development in the Global South is limited. This is because contextual and cultural factors that influence stakeholders' perception and behaviors in relation to water resources pollution and management may differ greatly (de França Doria, 2010). Given that there are significant contextual (e.g., socio-economic conditions) and cultural differences between the Global North and the Global South, it is unlikely that research outcomes will be the same. Consequently, extrapolating research findings from the Global North to the Global South for policy development may result in greater uncertainty and costly policy outcomes (Deasy et al., 2010; Okumah, Chapman, et al., 2019).

Moreover, past studies (Osteen et al., 2012; Ryan et al., 2003) have been useful in providing insights into the various categories of stakeholders that are willing to support water resource protection probably because their methodological applications have been chiefly quantitative. Of course, such categorization of stakeholders may provide directions to support the development of well-targeted policies, with potential suggestions on who to focus on during policy implementation. However, they may be limited in the extent to which they unpack the motivations behind stakeholders' willingness to support water resource protection. There is evidence to suggest that a superficial knowledge of "what" stakeholders want, without an integration of critical insights into "why" may result in significant adverse impacts of conservation policies (Carwardine et al., 2008). Understanding and integrating the drivers of stakeholders' motivations and willingness to support water protection are therefore crucial. A critical step in this direction is the application of qualitative techniques that offer the means to obtain a profound understanding of people's motivations and the underlying socio-cultural and contextual factors that drive their willingness to support water resource protection (Sieber, 1973; Wichmann & Köbbing, 2015).

In all the studies reviewed above, it is clear that little is known about the willingness and motivations of stakeholders to support water resources protection in the Global South, and existing studies have failed to uncover the deeper aspects of stakeholders' motivations. The present research explores the willingness and motivations of stakeholders to support water resource protection in a developing country context, using qualitative methods. As there may be commonalities across the contextual and cultural factors affecting water resources management in the Global South (particularly in sub-Saharan Africa), the findings should make an important contribution to understanding the drivers of motivations toward water resources protection in the broader context. Ultimately, this is expected to help develop and implement context-specific policies aimed at safeguarding water resources. This study is therefore in line with earlier calls on the need to understand and encourage stakeholders to engage in sustainable water resource management practices (OECD, 2012, 2017; United Nations, 2016; United Nations Environment Programme, 2017).

3 | CASE STUDY AREA AND METHODS

3.1 | Study area

The study was conducted in the Wenchi Municipality in the Bono Region of Ghana (see Figure 1). The municipality shares boundary to the south with Sunyani Municipality, the north with Kintampo South District, to the west with Tain District and to the east with the Techiman Municipality. It is situated within latitudes 7° 30' and 8° 05' North and longitudes 2° 15' West and 1° 55' East and covers an area of 1,296.6 km². The Municipality is endowed with many major rivers such as Tekyerebete, Tain, Subin, Yoyo, and Atwene that play a useful role in domestic, agricultural, and industrial activities (Wenchi Municipal Assembly, 2014). These water resources do not only serve the Municipality; there are a number of communities downstream that are more likely to be affected by river pollution from upstream (Okumah & Yeboah, 2019). The Wenchi Municipal Assembly (2014), further highlights that some rivers, for example, Tain, Subin, and Yoyo are deteriorating in quality due to anthropogenic factors such as poor land management practices, indiscriminate disposal of waste and open defecation, with several health, economic and ecological implications. Data from the Wenchi Municipal Assembly suggests that water-related diseases (e.g., Cholera and Intestinal worms) were among the top ten commonest diseases in the area (Wenchi Municipal Assembly, 2014).

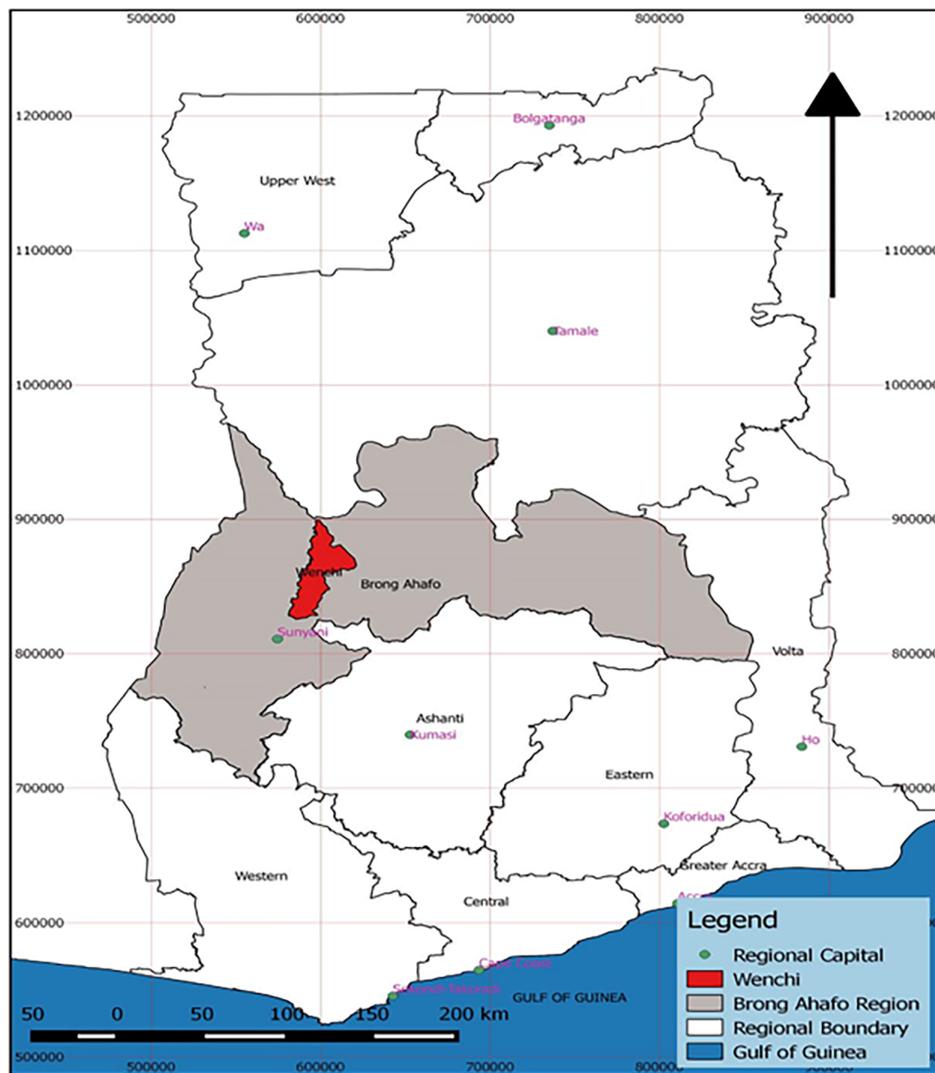


FIGURE 1 Map showing the Location of Wenchi in Central Ghana

The strong human–environment interaction and the potentially deteriorating state of the rivers in the Municipality make it important to explore stakeholders' perceptions of river water quality, their willingness to support interventions aimed at protecting water resources and their opinions on what they could do to support such initiatives. This may provide deep insights into understanding the foundations of people's behaviors in relation to water pollution, what and who to focus on during interventions from a policy perspective, ultimately contributing to the design and implementation of effective policies (Stringer, Scriciu, & Reed, 2009). Although, the present study is limited to the Wenchi Municipality, the results of the study has wider policy implications as the anthropogenic factors resulting in the pollution of water resources are similar across other places in the country and sub-Saharan Africa (OECD, 2012, 2017; Owusu, Asumadu-Sarkodie, & Ameyo, 2016; United Nations, 2016; United Nations Environment Programme, 2017; Wenchi Municipal Assembly, 2014).

3.2 | Implementing in-depth interviews

The overall goal of the study was to explore in-depth, stakeholders' willingness and motivations to support sustainable water resource management. The qualitative interview approach was selected as the technique enables researchers to inductively or retroductively investigate and gain deeper insights into such issues of interest (Marshall, 1996; Sieber, 1973; Wichmann & Köbbing, 2015). An interview guide was prepared to guide the interviews. The interview guide covered the key questions: (a) Are stakeholders' willing to support water protection initiatives? (b) What are the motivations for willing or not willing to support water protection initiatives? and (c) What actions are stakeholders willing to take to support water resources protection?

Next, we recruited interview participants through exponential nondiscriminative snowball sampling (Wichmann & Köbbing, 2015). This involved first, interviewing stakeholders from the Municipal Assembly

(e.g., Deputy Municipal Planning Officer) and the Traditional Council who then referred us to other potential participants. Stakeholders from the Municipal Assembly and Traditional Council were identified and subsequently selected for interviews based on their extensive knowledge in relation to water resource pollution and governance in the area. For instance, Authorities at the Municipal Assembly are involved in the regulation of practices that affect water resources. The Traditional Authorities on the other hand are custodians of the land and engage in activities that are aimed at protecting the environment of which water resources constitute an essential component. These roles and interest in water resources governance make these stakeholders more likely to have extensive knowledge of the sources of water pollution and other issues of water governance, thus, making them an important source of information for this research.

Following this, we conveniently contacted people and asked if they were willing to be interviewed. The selection excluded people that were strangers, travellers, and visitors in the community at the time of the study. Therefore, we only included inhabitants of the community as they were better placed to provide rich information on water resources pollution and governance in their communities. Overall, 11 face-to-face interviews were conducted in April, 2019 (see Table 1 for a profile of interview participants). To ensure that we had interactive and engaging sessions with interview participants, while taking accurate notes, interviews were recorded (following the consent of participants) and transcribed after the session (Cohen & Crabtree, 2006). Apart from three cases where Twi, the widely spoken Ghanaian Language was used,¹ all interviews were conducted in the English Language. In cases

where interviews were conducted in Twi, the interview content was translated to English during the transcription process. The intelligent verbatim method was applied to transcribe all interviews as this allows for the removal of fillers and repetitive comments (Golota, 2018). Responses were anonymized to ensure that readers could not trace answers to specific persons.

A striking feature of the 11 interview participants is their higher educational attainment. The higher level of educational attainment reflects the situation in the Municipality where majority of the people in the community have at least up to Senior High School qualification probably due to the availability of several educational institutions (Wenchi Municipal Assembly, 2014). On the other hand, this may be due in part, to the sampling strategy applied in this study which affects the scope of participants recruited as this technique might be prone to biases arising from self-selection – interviewing people who are pro-environmentally minded (Hedt & Pagano, 2011). A potential consequence of this selection bias is that the results would be skewed toward people who are educated. Given that the area is inhabited by both highly educated and noneducated persons, the results of the study have to be interpreted with caution.

Interview participants were categorized into two main groups: the first group consists of institutions; the Traditional Authorities and Municipal Assembly who have considerable regulatory and advisory roles to play in water governance in the Municipality, and the second group consists of households, who are a key source of pollution and have a role to play in water policy design (Wenchi Municipal Assembly, 2014). Moreover, the household category comprises individuals (e.g., farmers,

TABLE 1 Profile of interview participants

Institutional				
#	Gender	Age	Educational Attainment	Years lived in community
1	Male	33	BSc degree	33
2	Male	61	PhD	42
3	Female	34	BSc degree	3
Household				
1	- Female	27	BSc degree	14
2	- Female	31	High school	31
3	- Female	62	Postsecondary	48
4	- Female	54	No formal education	50
5	- Male	32	MSc degree	12
6	- Male	28	BSc degree	10
7	- Male	53	High school	48
8	- Male	42	No formal education	42

Note: Average age of interviewees = 41.55; Average number of years lived in community = 30.27.

industrialists, and so on). It is well known that one of the major sources of water pollution is poor agricultural practices and effluents from industrial activities (Hutchins, 2012; Novotny, 2013; OECD, 2012, 2017). This categorization of stakeholders was aimed at widening the spectrum of stakeholders and views covered in the study although the limited number of participants limits generalizability of results, a common limitation of qualitative studies.

3.3 | Analytical methods

We applied content analysis to scrutinize the interview transcripts in line with the study's goal: to explore stakeholders' willingness and motivations to support sustainable water management efforts. We applied a retroductive approach to analyze the transcripts because the approach helps to overcome the limitations of applying a purely inductive or deductive approach, useful for the refinement of existing ideas and/or production of new knowledge and help in using research to make informed policy decisions (Ragin, 1994).

Each transcript was analyzed through hand coding. The process began with a cursory reading of all transcripts, to get a fair idea of the interviews. Next, we read each transcript closely, while applying a ground theory (Strauss & Corbin, 1998) to code relevant statements, paragraphs and sections (with color codes). This process was iterative, with a focus on identifying recurring topics that emerge from the texts as well as their "meanings." Recurring topics were closely examined, while links between codes were established and categorized into themes. To ensure validity of our results, the process was reviewed in an iterative process until the results became quite stable. We also ensured that the content of each code was maintained for reference, as these were necessary for further analysis and drawing inferences. Following this, we presented the results for each research question using a manifest analysis (Bengtsson, 2016), where themes were considered first, key nodes used and reference made back to specific statements of interviewees. These results were further discussed in relation to existing literature, considering findings, context and methodological similarities, and differences to help draw sound conclusions.

4 | RESULTS

4.1 | Willingness and motivations to support river protection initiatives

In this section, we explore whether stakeholders were willing to engage in practices that contribute to reducing

river pollution, and what their motivations are. When asked "are you willing to support actions to protect the rivers?," all interview participants stated that they were willing to support actions to protect rivers. A wide range of reasons were provided as the motivations for their willingness to support actions to protect water resources (Table 2). These reasons fall under five themes: use value of water resources, protection of aquatic organisms, health purposes, moral obligation to sustain the resource for future generations, and leadership responsibility. Among these themes, use values were the commonly cited reasons for participants' willingness to protect water resources. Nine of the 11 interview participants indicated that the rivers are used for many purposes such as irrigation and other farm activities, recreation/tourism, fishing, drinking, and cooking, thus, their willingness to engage in initiatives that would help protect such water resources.

The next commonly cited theme (three participants) was "protection of aquatic organisms." Two participants noted that:

H1: There are a number of aquatic organisms in rivers. I would support these measures for the sake of the protection of these aquatic creatures.

H5: I believe that by protecting these water bodies I am contributing to sustainable development such that the rivers will not die out, they will exist to provide a place of abode for the living organisms in them.

On health-related motivations, a participant mentioned that:

H2: We [the inhabitants] have to support actions targeted at protecting water resources to benefit these rural dwellers who continue to use it... to avoid the outbreak of water-related diseases.

While the participant whose view reflects a moral obligation to protect water resources for future generations stated that:

H8: Our great grandparents protected the rivers for us. It is also incumbent on me to protect the river for the generations yet to be born.

These findings suggest that people's motivation for supporting water resource protection initiatives vary

TABLE 2 Motivations for willingness to support water resources protection

#	Key statement(s)	Theme (s)
I1	We do not only obtain drinking water from these water resources... <i>We use rivers to serve purposes of irrigation. As a community leader, residents expect you to employ every possible means to develop the community, such as getting them constant supply of water to enhance all year-round farming. I receive a lot of pressure from the members especially during the dry season. The farmers especially complain that there are not enough water resources to assist them irrigate their crops. As a result, it is therefore critical to protect these water bodies such that we can rely on them to enhance all year-round farming. It is even important to protect water resources as tourist attraction points.</i>	Use value: irrigation and recreational/tourism Leadership responsibility
I2	Water is life (saves the lives of people), <i>if all water bodies in the universe dry up, all people in the globe are also going to die. Water resources are essential because it underpins economies and sustains human wellbeing.</i> Therefore, protecting it must be a matter of urgent attention and consideration.	Use value
I3	I mean for all the benefits water provides for us and for the fact that we can even use the water resources for recreational purposes...	Use value: recreational value
H1	<i>These water resources have essential recreational values and helps to conserve nature. I would love it if we have such water sheds in our country. Also, there are a number of aquatic organisms in rivers. I would support these measures for the sake of the protection of these aquatic creatures.</i>	Use value: recreational value Protect aquatic organisms
H2	Water indeed is life and even with the prevalence of potable water sources like pipe and mechanized boreholes, <i>some rural folks continue to rely on rivers as their main source of drinking water.</i> We have to support actions targeted at protecting water resources to benefit these rural dwellers who continue to use it. Also, to avoid the <i>outbreak of water-related diseases.</i>	Use value Health purposes
H3	Farmers benefit from rivers, <i>they drink from the rivers. And even in the application of fertilizers, weedicide and insecticides, we need large volumes of water.</i> The main source of water to undertake these activities are the rivers.	Use value: drinking and farm use
H4	I have once relied on water bodies for drinking and cooking, other people continue to also rely on them. We must be interested in the protection of water resources for their sake. The organisms in the rivers like crabs and fishes also constitute an essential part of the world's food chain and need to be safeguarded.	Use value: drinking and cooking Protect aquatic organisms
H5	I believe that by protecting these water bodies I am contributing to sustainable development such that the rivers will not die out, <i>they will exist to provide a place of abode for the living organisms in them.</i>	Protect aquatic organisms
H6	When it comes to the provision of food like fishes and crabs, we obtain them from water bodies. We can also use water resources for tourism purposes.	Use value: food and recreation
H7	I will support these actions such that the river would be clean and safe for human use.	Use value
H8	Our great grandparents protected the rivers for us. It is also incumbent on me to protect the river for the generations yet to be born.	For future generations

widely, and all these need to be considered in interventions designed to influence uptake of pro-environmental behaviors.

4.2 | Actions to support river protection initiatives

Results in Section 4.1 show that people were willing to support initiatives to protect rivers emphasizing use value

of water resources, protection of aquatic organisms, health purposes, and moral obligation to sustain the resource for future generations and leadership responsibility as key motivations for their intentions. Here, we explore how interview participants intend to support water resources protection. In other words, what specific actions will they take up as their contributions to reducing river pollution in their communities?

To identify these initiatives, interviewees were asked to mention specific actions they would take to support

river protection. Institutional participants mentioned law enforcement and supporting communal initiatives such as tree planting and cleaning the riverbank. Household participants, on the other hand, mentioned engaging in sustainable environmental practices such as not defecating into rivers or around the riverbank, dumping refuse into the rivers, felling trees around the riverbank, among others (Table 3). Some interviewees were also ready to support by educating other community members on the need for water resources protection and how to engage in sustainable practices.

5 | DISCUSSION

This paper aimed at exploring stakeholders' willingness and motivations to support water resource protection as well as what they would do to support sustainable management of water resources. Accordingly, we conducted in-depth interviews and applied content analysis to explore interview transcripts. Here, we present potential limitations of the study before discussing our key findings. For instance, some interviews were conducted in Twi, after which we translated them to English Language. Like any cross-language qualitative research, this can pose inconsistencies in the data due to untranslatability of certain words and expressions, which will lead to the precise meaning to get lost in translation (Squires, 2008). However, this limitation has been partly resolved as the researchers—who are proficient in both languages—conducted, translated, and transcribed the interviews; there was no point during the research process where we relied on the services of a third party as an interpreter and/or translator. We now turn to discuss our findings.

5.1 | Willingness and motivations to support river protection initiatives

With respect to the first research question, it was found that all interview participants were willing to support interventions aimed at protecting rivers in the municipality. Consequently, this result reflects those of Edwards (1988) who found that stakeholders were willing to support water resources protection. Consistent with the literature (Buijs, 2009; Kohlmann et al., 2008), we found that stakeholders' willingness to support river protection is driven by the expected benefits of sustainable water resources management. These expectations or motivations fall under five major themes; use value of water resources, protection of aquatic organisms, health benefits, moral obligation to sustain the resource for future

generations and leadership responsibility, which have been highlighted by earlier studies albeit in a disjointed or fragmented manner. For instance, Kohlmann et al. (2008) and Buijs (2009) found that stakeholders' support for river protection were attributed to the recreational roles of such resources. Others include the protection of aquatic organisms (e.g., Bouwer, 2000), health benefits (e.g., Gürlük, 2006; Loomis et al., 2000; Van Der Heide et al., 2008), and the need to uphold moral obligations to future generations (e.g., United Nations General Assembly, 2007).

On leadership responsibility, Boelens, Chiba, and Nakashima (2006) note that water resource protection is stimulated by traditional knowledge and ways of life that makes it imperative for leaders to take critical steps at protecting the environment. The authors further add that traditional norms and values therefore ascribe the responsibility of caring for sacred natural resources in the care of societal leaders. As a result, persons charged with leadership roles in societies are motivated to take up water resource protection efforts (as revealed in the present study). In addition, this may be influenced by stakeholders' obligation to take up civic initiatives in protecting water resources. Therefore, while this study confirms the findings of earlier studies, our work contributes to existing knowledge by advancing our understanding of the motivations; this appears to be one of the studies so far documenting a large number of stakeholders' motivations for supporting water resources protection, particularly in the Global South.

It is interesting to note that among all five motivations identified in this study, the uses of a nonpolluted river were the commonly cited reasons for participants' willingness to protect water resources. Almost all interview participants mentioned that the rivers are used for many purposes such as irrigation and other farm activities, recreation and tourism, fishing, drinking, and cooking, thus, their willingness to engage in initiatives that would help protect such water resources. As found in past empirical studies, the value that people place on water resources lies in the aesthetic, socio-ecological and cultural roles of the resource (Buijs, 2009; Kohlmann et al., 2008). This in turn determines how stakeholders evaluate its quality and whether to protect the quality of the resource or not. For instance, where river water serves as a source of tourism and recreation, stakeholders are likely to be concerned about the aesthetic value of the river (Barnett, Jackson-Smith, & Haeffner, 2018) and are more likely to be motivated to protect its quality (Bouwer, 2000; Kohlmann et al., 2008; Buijs, 2009). Where the river is a major source of water for drinking and cooking, stakeholders may be concerned about the health risks associated with consuming polluted water

TABLE 3 Actions to support water resources protection

#	Key statement(s)	Theme (s)
I1	As a leader, I initiated a protection measure of planting trees around the water bodies to conserve the rivers. These are actions I took and I must say they have gone a long way to help protect these water resources. So, if we organize communal labor to clean around the rivers and dredge out the massive sand accumulated in the rivers and also plant trees around them, it will protect water resources.	Initiate tree planting Clean around the rivers
I2	As a traditional leader... <i>I can support tree planting along river bodies by mobilizing my subjects to help facilitate that activity.</i> I can also be part of a committee set-up by the traditional council to oversee the protection of water resources. We would ensure as a committee that <i>people found culpable of polluting the rivers are made to face the full rigor of the law</i> to deter others.	Initiate tree planting Punish culprits
I3	For my outfit, we work closely with the works department and the building inspectorate division and <i>we make sure the buffer restrictions along water resources are strictly adhered to. We do not even allow prospective developers to get that close to these water bodies.</i>	Enforcing regulations to protect rivers
H1	...by not littering and defecating into the rivers. <i>I would also educate people on the need to protect these water resources.</i> If I also have the opportunity to find people behaving negatively toward the river, <i>I will try to correct them desists from such attitudes.</i>	Engage in sustainable practices Create awareness
H2	<i>I will behave responsibly toward the protection of water resources. I will not litter or defecate in the river.</i> Also, when it comes to communal work at conserving the water resources, I will wholeheartedly support such measures.	Engage in sustainable practices
H3	<i>I will warn those felling trees and clearing vegetation around the rivers to stop.</i>	Encourage sustainable practices
H4	I will only support government strategies geared at protecting water resources. With my time and energy, I think I would support the protection of water resources.	Support municipal initiatives
H5	<i>I will try to educate people not to do that and not also do that myself.</i>	Engage in sustainable practices Create awareness
H6	<i>I will embark on education to enlighten the public on the need to protect water resources.</i>	Create awareness
H7	If a communal labor is organized in protecting the river, I will actively participate.	Support communal initiatives
H8	<i>I will support the community efforts aimed at protecting the river. Also, I will chide all persons I find throwing waste substances into the river.</i> I can also provide tools and equipment like shovels, cutlasses, and mattocks to dredge and keep the river clean.	Support communal initiatives Encourage sustainable practices

(de Lira Azevêdo et al., 2018). These concerns may trigger positive attitudes and willingness to protect rivers. This confirms our findings as a respondent noted that H2: “we [the inhabitants] have to support actions targeted at protecting water resources to benefit these rural dwellers who continue to use it... to avoid the outbreak of water-related diseases.”

Put together, willingness to take up initiatives is positive, and a prospect for engaging community members in interventions. However, willingness may not always translate into actions due to at least two reasons: social desirability bias; interview participants could state their willingness to support water resource protection in order to project a favorable image of themselves and to avoid receiving negative evaluations; in some situations, this may not be their true position on the subject (Kormos & Gifford, 2014). If this is the case, there is likely to be a deviation between behavioral willingness and actual performance of the stated initiatives. Second, even when responses reflect their true position (i.e., if stakeholders

were genuinely willing to support these practices), other factors could hinder them from engaging in them. For instance, situational factors such as time, logistics, finance, and technical resources needed to engage in pro-environmental practices may hinder some people from taking up actions (e.g., cleaning the riverbank and planting trees). Another potential challenge is the lack of trust in institutions (Table 2), which according to Blake (1999), often discourages people from taking up environmentally responsible measures. As some interview participants noted, the fulfillment of their roles depends on the authorities' commitment to providing the necessary conditions such as logistical, financial and technical support. Therefore, (where they are lacking), these conditions need to be put in place to facilitate the translation of behavioral willingness to actual performance of stated initiatives.

Additionally, findings suggest that motivations for supporting water resource protection policies vary widely, and all these need to be considered in

interventions designed to influence uptake of pro-environmental behaviors. However, there is the need to emphasize use value of water resources as this appears to be a commonly stated motivation for stakeholders' willingness to protect the rivers. Nonetheless, because the study relied on a limited number of interview participants, these views may not represent the position of the study communities. Like any qualitative research, the limited number of interview participants does not allow for exploring data across various dimensions (e.g., socio-demographics). Past studies report that stakeholders' knowledge of an environmental problem, personal experience (e.g., Tarannum, Kansal, & Sharma, 2018), social position and regulatory roles (e.g., Haeffner, Jackson-Smith, & Flint, 2018), and socio-demographic characteristics (Fobil, May, & Kraemer, 2010; Haeffner et al., 2018; Withanachchi et al., 2018) may affect their evaluation of an environmental resource and their motivations to support interventions. Therefore, future studies could benefit from a stratified sampling strategy where participants are recruited based on various socio-demographic characteristics such as type of economic activity (e.g., farmers and industrialists) and income classes. Exploring the views of a wide range of stakeholders across several dimensions may offer further insights that could complement results of existing studies to shape future policy development.

5.2 | Actions to support river protection initiatives

The final objective of this research was to explore how interview participants intend to support water resources protection measures. In this study, interview participants from institutions ascribe initiatives such as tree planting and cleaning the riverbank to institutions specifically, the municipal assembly, and traditional authorities. This was based on the belief that these authorities have the legal support, technical and financial resource capacity to undertake such activities. This appears to support the findings of De Loe, Krewtzwiser, and Neufeld (2005) that although the management of water resources goes beyond a particular stakeholder, local, and provincial leadership is critical in shaping water resource protection. They found that jurisdictions whose leaders were involved in water resource preservation were distinctive in their achievements; municipalities that had developed consistent vision and had constituted proper institutional arrangements through municipal leadership had achieved considerable success in protecting water resources.

On the other hand, household participants mentioned educating their neighbors on sustainable water

management practices and engaging in environmentally responsible behaviors such as not defecating in and/or around rivers, dumping refuse into the rivers, felling trees around the riverbank, and engaging in sustainable agricultural practices. Indeed, evidence suggests that these are some of the main sources of river pollution, therefore, by avoiding such practices, it is believed that the risk of water pollution were more likely to reduce (Owusu et al., 2016; Yeleliere, Cobbina, & Duwiejuah, 2018). These findings do not depart from the recommendations of Ryan et al. (2003) such as keeping a long grass of buffer along the water resources, maintaining vegetation cover of shrubs and trees around water resources, cleaning out rubbish and planting trees and shrubs along water resources. Some interview participants were ready to support by educating other community members on the need for water resources protection and how to engage in sustainable practices.

Therefore, contrary to the claim that indigenes ascribe the responsibility of protecting water resources to governments (Agarwal et al., 2000; De Loe & Krewtzwiser, 2007), this study's results reflect responsibilities for both authorities (e.g., community leaders, municipal assembly, and the state) and individuals. This rather contradictory result may be due to the focus of the study. That is, whether people attribute a responsibility to the government or themselves, depends on the role in question. For instance, the development and enforcement of regulatory frameworks appears to be the mandate of the government, whereas more specific activities within households and catchments may be undertaken by individuals. Furthermore, the distinction between roles suggested by household and institutional participants suggests the potential influence of social position and seems to corroborate the ideas of Haeffner et al. (2018), who found that community leaders (e.g., mayors, city council persons, and public utilities staff) differ from the general public on water resource matters. This difference has been attributed to their roles and probably, a variation in contextual and experiential knowledge in relation to water resources management. People working with institutions that have a link with water governance may already have clear roles within the institutional context and are therefore likely to link their expectations to such roles. Moreover, continuous engagement in water governance roles may deepen their understanding of water pollution and action strategies, that is, tacit knowledge (Armstrong & Mahmud, 2008) subsequently shaping their views on what to do.

6 | CONCLUDING REMARKS

The purpose of the current study was to explore stakeholders' willingness and motivations to support water

resource protection including what stakeholders would do to support sustainable water resources management. One of the more significant findings to emerge from this study is that stakeholders appear to be willing to support water protection measures due to a wide range of motivations. Although the current study is based on a small sample of participants, the findings suggest that water use value is the most important driver of stakeholders' willingness to support the protection of rivers. An important practical implication of this finding is that policymakers may need to emphasize water use value when encouraging the general public and/or segments of the society to engage in sustainable water resource management practices, however, an important first step is needed in this direction. This involves scaling up the study to a broader population to determine whether indeed this is a reflection of the big picture. Given resource constraints, a key strategy may be the application of a stratified sampling technique where interview participants are selected across a wide range of socio-demographic groups.

Another important finding is that while stakeholders offer a number of roles that they can play as individuals, they ascribe certain responsibilities to institutions such as the government and traditional authorities. This perception might mean that willingness may not guarantee actual performance of stakeholders' roles; government and community leaders need to provide the necessary conditions and also perform their own roles to enable individuals discharge their responsibilities. Additionally, the diverse roles identified by interview participants might imply that people have different roles to play in protecting water resources probably due to differences in environmental awareness, occupation types, among others. Therefore, a natural progression of this work is to analyze the socio-cultural and contextual factors responsible for the different roles and how best to integrate this in policy development and implementation. This could enable policymakers to design more targeted strategies and tailor them to the capacities and circumstances of different socio-demographic groups. Ultimately, this could help encourage more sustainable practices that would help to mitigate river water pollution and improve river water quality.

ACKNOWLEDGMENT

Authors are grateful to interview participants for their time. Many thanks to Thirze Hermans (Sustainability Research Institute, University of Leeds) and two anonymous reviewers for their valuable comments on an earlier version of the manuscript.

CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTIONS

M.O.: conceptualization, methodology, investigation, formal analysis, writing-original draft preparation, reviewing and editing, project administration. A.S.Y.: conceptualization, data collection, methodology, writing-original draft preparation, resources, project administration. O.A.: conceptualization, data collection, methodology, writing-original draft preparation.

DATA AVAILABILITY STATEMENT

We do not have the right to provide access to data based on agreement with interview participants.

ETHICS STATEMENT

No ethical approval was required, although, we obtained an oral approval from the Department of Planning, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana to undertake the research. We followed research ethics in conducting the study. For example, we explained the purpose of the research to the participants. We assured respondents of anonymity and confidentiality. Respondents were at liberty to withdraw from the interview at any point.

ORCID

Murat Okumah  <https://orcid.org/0000-0002-2937-8467>

Ata S. Yeboah  <https://orcid.org/0000-0002-8150-7991>

ENDNOTE

¹ This was due to participants' low proficiency in the English Language.

REFERENCES

- Agarwal, A., Delos Angeles, M. S., Bhatia, R., Cheret, I., Davila-Poblete, S., Falkenmark, M., ... Wright, A. (2000). *Integrated water resources management*. Stockholm: Global Water Partnership.
- Amponin, J.A., Bennagen, M.E.C., Hess, S., & Dela Cruz, J. 2007. *Willingness to Pay for Watershed Protection by Domestic Water Users in Tuguegarao City, Philippines*. Poverty reduction and environmental management (PREM) working paper, 7(06), pp. 2007-06.
- Armstrong, S. J., & Mahmud, A. (2008). Experiential learning and the acquisition of managerial tacit knowledge. *Academy of Management Learning & Education*, 7, 189–208.
- Barnes, A. P., Willock, J., Hall, C., & Toma, L. (2009). Farmer perspectives and practices regarding water pollution control programmes in Scotland. *Agricultural Water Management*, 96, 1715–1722.
- Barnett, M. J., Jackson-Smith, D., & Haeffner, M. (2018). Influence of recreational activity on water quality perceptions and concerns in Utah: A replicated analysis. *Journal of Outdoor Recreation and Tourism*, 22, 26–36.
- Bateman, I. J., Cole, M. A., Georgiou, S., & Hadley, D. J. (2006). Comparing contingent valuation and contingent ranking: A

- case study considering the benefits of urban river water quality improvements. *Journal of Environmental Management*, 79, 221–231.
- Bengston, D. N. (1994). Changing forest values and ecosystem management. *Society & Natural Resources*, 7(6), 515–533.
- Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, 2, 8–14.
- Blackstock, K. L., Ingram, J., Burton, R., Brown, K. M., & Slee, B. (2010). Understanding and influencing behaviour change by farmers to improve water quality. *Science of the Total Environment*, 408, 5631–5638.
- Blake, J. (1999). Overcoming the 'value-action gap' in environmental policy: tensions between national policy and local experience. *Local Environment*, 4(3), 257–278.
- Boelens, R., Chiba, M., & Nakashima, D. (2006). *Water and Indigenous peoples, knowledges of nature* (pp. 108–115). Paris, France: UNESCO.
- Bouwer, H. (2000). Integrated water management: emerging issues and challenges. *Agricultural Water Management*, 45(3), 217–228.
- Buijs, A. E. (2009). Public support for river restoration. A mixed-method study into local residents' support for and framing of river management and ecological restoration in the Dutch floodplains. *Journal of Environmental Management*, 90, 2680–2689.
- Carson, R. T., & Mitchell, R. C. (1993). The value of clean water: the public's willingness to pay for boatable, fishable, and swimmable quality water. *Water Resources Research*, 29(7), 2445–2454.
- Carwardine, J., Wilson, K. A., Watts, M., Etter, A., Klein, C. J., & Possingham, H. P. (2008). Avoiding costly conservation mistakes: the importance of defining actions and costs in spatial priority setting. *PLoS One*, 3, e2586.
- Chen, W. Y., & Jim, C. Y. (2010). Resident motivations and willingness-to-pay for urban biodiversity conservation in Guangzhou (China). *Environmental Management*, 45(5), 1052–1064.
- Cobbinah, P. B. (2015). Local attitudes towards natural resources management in rural Ghana. *Management of Environmental Quality: An International Journal*, 26(3), 423–436. <https://doi.org/10.1108/MEQ-04-2014-0061>
- Cohen, D. and Crabtree, B. 2006. Qualitative research guidelines project.
- Daxini, A., O'donoghue, C., Ryan, M., Buckley, C., Barnes, A. P., & Daly, K. (2018). Which factors influence farmers' intentions to adopt nutrient management Planning? *Journal of Environmental Management*, 224, 350–360.
- de França Doria, M. (2010). Factors influencing public perception of drinking water quality. *Water Policy*, 12, 1–19.
- de Lira Azevedo, E., Medeiros, C. R., Gomes, W. I. A., Da Silva Azevedo, D. J., Alves, R. R. N., Dias, T. L. P., & Molozzi, J. (2018). The use of risk incidence and diversity indices to evaluate water quality of semi-arid reservoirs. *Ecological Indicators*, 90, 90–100.
- De Loe, R., & Kreutzwiiser, R. (2007). Challenging the status quo: The evolution of water governance in Canada. In K. Bakker (Ed.), *Eau Canada: The future of Canada's water* (pp. 85–103). Vancouver, BC: University of British Columbia Press.
- De Loe, R. C., Kreutzwiiser, R. D., & Neufeld, D. (2005). Local groundwater source protection in Ontario and the Provincial Water Protection Fund. *Canadian Water Resources Journal*, 30(2), 129–144.
- Deasy, C., Quinton, J. N., Silgram, M., Bailey, A. P., Jackson, B., & Stevens, C. J. (2010). Contributing understanding of mitigation options for phosphorus and sediment to a review of the efficacy of contemporary agricultural stewardship measures. *Agricultural Systems*, 103, 105–109.
- Desvousges, W. H., Smith, V. K., & Fisher, A. (1987). Option price estimates for water quality improvements: A contingent valuation study for the Monongahela River. *Journal of Environmental Economics and Management*, 14, 248–267.
- Duckett, D., Feliciano, D., Martin-Ortega, J., & Munoz-Rojas, J. (2016). Tackling wicked environmental problems: The discourse and its influence on practice in Scotland. *Landscape Urban Plan*, 154, 44–56.
- Edwards, S. F. (1988). Option prices for groundwater protection. *Journal of Environmental Economics and Management*, 15, 475–487.
- Epstein, S. S., Brown, L. O., & Pope, C. (1982). *Hazardous Waste in America*. San Francisco, CA: Sierra Club.
- Fobil, J., May, J., & Kraemer, A. (2010). Assessing the relationship between socioeconomic conditions and urban environmental quality in Accra, Ghana. *International Journal of Environmental Research and Public Health*, 7, 125–145.
- Golota, H. 2018. Get smart: Understanding intelligent verbatim transcription. Available from <https://www.globalme.net/blog/understanding-intelligent-verbatim-transcription>
- Gürlük, S. (2006). The estimation of ecosystem services' value in the region of Misi rural development project: Results from a contingent valuation survey. *Forest Policy and Economics*, 9, 209–218.
- Haefner, M., Jackson-Smith, D., & Flint, C. G. (2018). Social position influencing the water perception gap between local leaders and constituents in a socio-hydrological system. *Water Resources Research*, 54, 663–679.
- Hamilton, L. C. (1985a). Concerns about toxic wastes, three demographic predictors. *Sociological Perspectives*, 28, 463–486.
- Hamilton, L. C. 1985b. Public response to the discovery of water contamination, Center Report, Univ. of New Hampshire Water Resour., Durham.
- Hedt, B. L., & Pagano, M. (2011). Health indicators: eliminating bias from convenience sampling estimators. *Statistics in Medicine*, 30, 560–568.
- Hoelting, K. R., Hard, C. H., Christie, P., & Pollnac, R. B. (2013). Factors affecting support for Puget Sound Marine Protected Areas. *Fisheries Research*, 144, 48–59.
- Hutchins, M. G. (2012). What impact might mitigation of diffuse nitrate pollution have on river water quality in a rural catchment? *Journal of Environmental Management*, 109, 19–26.
- Inman, A., Winter, M., Wheeler, R., Vrain, E., Lovett, A., Collins, A., ... Cleasby, W. (2018). An exploration of individual, social and material factors influencing water pollution mitigation behaviours within the farming community. *Land Use Policy*, 70, 16–26.
- Jiang, Y., Jin, L. S., & Lin, T. (2011). Higher water tariffs for less river pollution-Evidence from the Min River and Fuzhou City in China. *China Economic Review*, 22, 183–195.
- Kay, P., Grayson, R., Phillips, M., Stanley, K., Dodsworth, A., Hanson, A., ... Taylor, S. (2012). The effectiveness of agricultural stewardship for improving water quality at the catchment

- scale: Experiences from an NVZ and ECSFDI watershed. *Journal of Hydrology*, 422, 10–16.
- Kohlmann, B., Mitsch, W. J., & Hansen, D. O. (2008). Ecological management and sustainable development in the humid tropics of Costa Rica. *Ecological Engineering*, 34, 254–266.
- Kormos, C., & Gifford, R. (2014). The validity of self-report measures of proenvironmental behavior: A meta-analytic review. *Journal of Environmental Psychology*, 40, 359–371.
- Loomis, J., Kent, P., Strange, L., Fausch, K., & Covich, A. (2000). Measuring the total economic value of restoring ecosystem services in an impaired river basin: Results from a contingent valuation survey. *Ecological Economics*, 33, 103–117.
- Macgregor, C. J., & Warren, C. R. (2006). Adopting sustainable farm management practices within a Nitrate Vulnerable Zone in Scotland: The view from the farm. *Agriculture, Ecosystems & Environment*, 113, 108–119.
- Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice*, 13(6), 522–526.
- Mcfarlane, B. L., & Boxall, P. C. (2000). Factors influencing forest values and attitudes of two stakeholder groups: The case of the Foothills Model Forest, Alberta, Canada. *Society & Natural Resources*, 13(7), 649–661.
- Novo, P., Martin-Ortega, J., & Holstead, K. (2015). Making mitigation of rural diffuse pollution work: facts and gaps regarding stakeholder's views and perceptions. XVth IWRA World Water Congress, Edinburgh, 25–29 of May 2015.
- Novotny, V. (2013). Diffuse pollution from agriculture — A worldwide outlook. *Water Science and Technology*, 39, 1–13.
- OECD. (2012). *Water quality and agriculture: meeting the policy challenge*. OECD studies on water. Paris: Organisation for Economic Co-operation and Development.
- OECD. (2017). *Diffuse pollution, degraded waters: Emerging policy solutions*. Paris: OECD Publishing.
- Okumah, M., Chapman, P., Martin-Ortega, J., & Novo, P. (2019). Mitigating agricultural diffuse pollution: Uncovering the evidence base of the awareness–behaviour–water quality pathway. *Water*, 11(1), p29.
- Okumah, M., Martin-Ortega, J., & Novo, P. (2018). Effects of awareness on farmers' compliance with diffuse pollution mitigation measures: A conditional process modelling. *Land Use Policy*, 76, 36–45.
- Okumah, M., & Yeboah, A. S. (2019). Exploring stakeholders' perceptions of the quality and governance of water resources in the Wenchi municipality. *Journal of Environmental Planning and Management*, 1–29. <https://doi.org/10.1080/09640568.2019.1663724>
- Okumah, M., Yeboah, A. S., Nkiaka, E., & Azerigyik, R. A. (2019). What determines behaviours towards water resources management in a rural context? Results of a quantitative study. *Resources*, 8, 109.
- Osteen, C., Gottlieb, J., & Vasavada, U. (2012). *Agricultural resources and environmental indicators*. Economic Research Service. Washington, DC: United States Department of Agriculture (USDA) EIB-98.
- Owusu, P. A., Asumadu-Sarkodie, S., & Ameyo, P. (2016). A review of Ghana's water resource management and the future prospect. *Cogent Engineering*, 3, 1164275.
- Patterson, J. J., Smith, C., & Bellamy, J. (2013). Understanding enabling capacities for managing the 'wicked problem' of non-point source water pollution in catchments: A conceptual framework. *Journal of Environmental Management*, 128, 441–452.
- Pearson, L. J., Coggan, A., Proctor, W., & Smith, T. F. (2010). A sustainable decision support framework for urban water management. *Water Resources Management*, 24(2), 363–376.
- Ragin, C. (1994). A qualitative comparative analysis of pension systems. In T. Janoski & A. M. Hicks (Eds.), *The comparative political economy of the welfare state* (pp. 320–345). New York, NY: Cambridge University Press.
- Ryan, R. L., Erickson, D. L., & De Young, R. (2003). Farmers' motivations for adopting conservation practices along riparian zones in a mid-western agricultural watershed. *Journal of Environmental Planning and Management*, 46(1), 19–37.
- Shang, Z., Che, Y., Yang, K., & Jiang, Y. (2012). Assessing local communities' willingness to pay for river network protection: A contingent valuation study of Shanghai, China. *International Journal of Environmental Research and Public Health*, 9(11), 1335–1382.
- Siebert, S. D. (1973). The integration of fieldwork and survey methods. *American Journal of Sociology*, 73, 3866–1359.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research techniques*. Thousand Oaks, CA: Sage Publications.
- Stringer, L. C., Scricciu, S. S., & Reed, M. S. (2009). Biodiversity, land degradation, and climate change: participatory planning in Romania. *Applied Geography*, 29(1), 77–90.
- Squires, A. (2008). Methodological challenges in cross-language qualitative research: A research review. *International Journal of Nursing Studies*, 46(2), 277–287. <https://doi.org/10.1016/j.ijnurstu.2008.08.006>
- Tarannum, F., Kansal, A., & Sharma, P. (2018). Understanding public perception, knowledge and behaviour for water quality management of the river Yamuna in India. *Water Policy*, 20(2), 266–281.
- United Nations. (2016). *Global Sustainable Development Report 2016*. New York, NY: Department of Economic and Social Affairs.
- United Nations Environment Programme. (2017). *Towards a pollution free planet background report*. Nairobi, Kenya: Author.
- United Nations General Assembly. 2007. United Nations declaration on the rights of Indigenous peoples. Retrieved from http://www.dd-rd.ca/site/_PDF/un/A_61_L67eng.pdf
- Van Der Heide, C. M., Van Der Bergh, J. C. J. M., Van Ierland, E. C., & Nunes, P. A. L. D. (2008). Economic valuation of habitat defragmentation: A study of the Veluwe, the Netherlands. *Ecological Economics*, 67, 205–216.
- Vrain, E., & Lovett, A. (2016). The roles of farm advisors in the uptake of measures for the Mitigation Of Diffuse Water Pollution. *Land Use Policy*, 54, 413–422.
- Wenchi Municipal Assembly. (2014). *District medium-term development plan*. Wenchi, Ghana: Author.
- Wichmann, S., & Köbbing, J. F. (2015). Common reed for thatching—a first review of the European market. *Industrial Crops and Products*, 77, 1063–1073.
- Withanachchi, S., Kunchulia, I., Ghambashidze, G., Al Sidawi, R., Urushadze, T., & Ploeger, A. (2018). Farmers' perception of water quality and risks in the mashavera river basin, georgia:

- Analyzing the vulnerability of the social-ecological system through community perceptions. *Sustainability*, 10, 3062.
- Yeleeiere, E., Cobbina, S., & Duwiejuah, A. (2018). Review of Ghana's water resources: The quality and management with particular focus on freshwater resources. *Applied Water Science*, 8, 93.
- Yoder, L., Ward, A. S., Dalrymple, K., Spak, S., & Lave, R. (2019). An analysis of conservation practice adoption studies in agricultural human-natural systems. *Journal of Environmental Management*, 236, 490–498.

How to cite this article: Okumah M, Yeboah AS, Amponsah O. Stakeholders' willingness and motivations to support sustainable water resources management: Insights from a Ghanaian study. *Conservation Science and Practice*. 2020;2:e170. <https://doi.org/10.1111/csp2.170>