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Implications of environmental sanitation management for sustainable livelihoods in the catchment area of Benya Lagoon in Ghana

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ABSTRACT

The study explored the implications of environmental sanitation for three coastal livelihood activities, namely fishing, tourism and salt production. Qualitative data were collected from purposively selected respondents through key informant interviews and focus group discussions, and analysed using thematic and most significant stories approaches. The study found that sanitation affected livelihoods associated with tourism, fishing and salt production through its implications for health, productivity, income, job security and sustainability of the physical environment. However, while virtually all respondents acknowledged the effect of sanitation on human capital through the health implications, a substantial part of the people who eked their living from the stated livelihood activities did not appreciate the link between sanitation and these livelihood avenues. Sanitation behavioural change communication messaging by the responsible actors should, therefore, stress the relevance of sanitation not only for human health but also the linkage between sanitation and sustainable livelihood in its entirety.

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Introduction

Environmental sanitation management (ESM) has become a topical global development issue due to its relevance to sustainable livelihoods and development. The UN Sustainable Development Goals (SDGs) acknowledge the livelihood implications of ESM for sustainable development and, therefore, urge all countries to focus on policies and programmes that bring ESM to the centre stage of their development agenda in order to ensure sustainable livelihood transformation. According to the USAID (2013), the natural environment, including the water bodies such as the sea and the lagoon as natural capital, and their associated livelihood activities such as fishing and salt production is threatened by poor ESM practices. For livelihood sustainability reasons, Goal 14 of the (SDGs) has been geared towards ensuring sustainable use of the oceans, seas and marine resources. This goal recognizes that over 3 billion people depend on marine and coastal biodiversity for their livelihoods and, therefore, allowing poor ESM to endanger the sustainability of livelihoods of this population is unacceptable, hence, the global call

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on all countries to improve ESM for improved livelihoods. In this respect, Goal 6 of the SDGs has been directed at ensuring availability and sustainable management of water and sanitation for all (Hedberg 2015; Aryitey 2016), and Target 6.2 of this goal aims to achieve by 2030, access to adequate and equitable sanitation and hygiene for all, and end open defecation.

Although efforts are being made by various countries to improve ESM, poor environmental sanitation practices, particularly open defecation and indiscriminate waste disposal practices persist in a number of countries, mostly the developing ones. There is a growing concern about this phenomenon's threat to sustainability of livelihoods, especially water-based and tourism-associated livelihoods in coastal communities, which provide sustenance for the teeming coastal poor (Small and Nicholls 2003; Lattermann 2010; Dengerink 2013). Small and Nichols, for instance, see this as a matter of great concern, given the importance of coastal livelihoods in the development process. Coastal communities usually attract high population growth because of the special centrality of their location. They are the interface between the land and the sea, and provide livelihoods through marine trade and transport, fishing, salt production and tourism (Kruijssen and Asare 2013). According to Kruijssen and Asare, the bulk of the economically vulnerable coastal population depend on the natural environment for sustenance, implying that their livelihood destinies are linked to the local environment and so environmental issues in coastal communities must be of prime concern to the local people in particular, and the government as a whole.

The relevance of improved ESM for sustainable livelihood and development is grounded in the sustainable livelihoods theory. The theory emphasizes the use of capacities and assets to make a living in a manner that can cope with stresses and shocks and enhance livelihood now and in the future (Carney 1998; Dengerink 2013; Jalic 2017). The socio-economic cost-benefit dynamics and sustainable livelihood implications of environmental sanitation make it imperative to treat ESM as a crucial development issue. Minh and Nguyen-Viet (2011) have opined that, Cambodia, Indonesia, the Philippines and Vietnam lose about US\$9 billion per year, or approximately 2% of their combined gross domestic product (GDP) due to poor ESM. This translates to a per capita loss of US\$22.20. Similarly, according to the Water and Sanitation Programme of the World Bank (2012) Ghana's economy loses 290 million US dollars annually, which is equivalent to 1.6% of the country's GDP due to poor ESM, with open defecation alone costing the country as much as US\$79 million per annum (Nimoh 2016). In line with the recognition of the socio-economic implications of poor ESM, Ghana enjoins ESM stakeholders, including relevant Ministries Departments and Agencies and the private sector to ensure proper ESM practices in all communities, especially the coastal and tourist attraction communities. This is because tourism and other economic activities such as fishing and salt production, which are carried out mostly in coastal communities in Ghana, contribute to sustainable livelihoods through job opportunities, income generation, food security and foreign exchange (Lai and Nepal 2006; Hamenoo 2011).

The communities in the catchment area of Benya Lagoon in the Komenda-Edina-Eguafo-Abrem (KEEA) Municipality, Ghana, hold a huge promise for contributing to livelihood and sustainable development through tourism and water-based livelihood activities such as fishing and salt production (Dorkenoo 2013) but poor sanitation management practices in the area threaten the sustainability of these livelihood activities. The

significance of this area, especially Elmina, is historical and socio-economic. Historically, it is a prominent tourist centre of international repute owing to its special association with the colonization of Africa, the infamous Trans-Atlantic slave trade as well as the presence of ancient monuments. Elmina Castle and Fort Jargo in the area, for instance, are two of the few treasured world heritage sites and, therefore, attract both local and international tourists on a constant basis. Additionally, the area has a rich cultural heritage epitomized by the celebration of an annual traditional festival, namely "Bakatue", which attracts patronage from all over the country and beyond, thereby promoting tourism.

On the local front, the area is one of the most important fishing enclaves in Ghana with, arguably, the biggest traditional fishing port in the country, which contributes to local and national economic development (Keea and Doortmont 2003). The area also has a number of small scale salt firms, which provide livelihood support to local residents and contribute to Ghana's GDP as well. Water from the Benya Lagoon serves as raw material for salt firms located in the catchment area of the lagoon. Hence, improper sanitation practices, particularly open defecation and indiscriminate dumping of refuse and sewage in the lagoon as currently happening in the area, could have implications for the lagoon, the sea and their aquatic resources such as fish and salt as well as tourism and their associated livelihoods for the local people, and Ghana by extension (Khadka 2015). It could affect the livelihood capacities and assets in the area. That is, it could weaken the human, natural and financial capital base (Carney 1998) of the people by constraining opportunities for good health, employment and income, and also jeopardize activities such as tourism, salt mining and fishing, which are at the centre of livelihood empowerment in the study area.

However, the extent to which the local people, especially those in the coastal communities in general and the catchment area of Benya Lagoon in particular, appreciate the relationship between ESM and their livelihood is worrying and intriguing as the people continue to engage in all manner of poor sanitation practices, which could have dire consequences for environmental sustainability and the sustainability of their own livelihood opportunities or avenues, namely fishing, salt mining and tourism. Against this background, the study, guided by the sustainable livelihood theory, explored the implications of poor ESM practices for the livelihoods of coastal communities in the catchment area Benya Lagoon in the Central Region of Ghana which is one of the most deprived regions in Ghana.

Theoretical and conceptual discussions

The paper is underpinned by the sustainable livelihoods theory. This theory relates to the ability of a social unit or system to enhance or maintain its livelihood on a sustainable basis, using its assets and capabilities in the face of shocks and stresses over time (Carney 1998). The theory identifies key livelihood assets as well as the nature and impacts of environmental, economic and social shocks and stresses on these assets. Carney (2002) defines livelihood as comprising the capabilities and assets required for a means of living. In Carney's view, a livelihood should be sustainable by being able to cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. In line with Carney's conception, the Department for International Development (DFID) developed

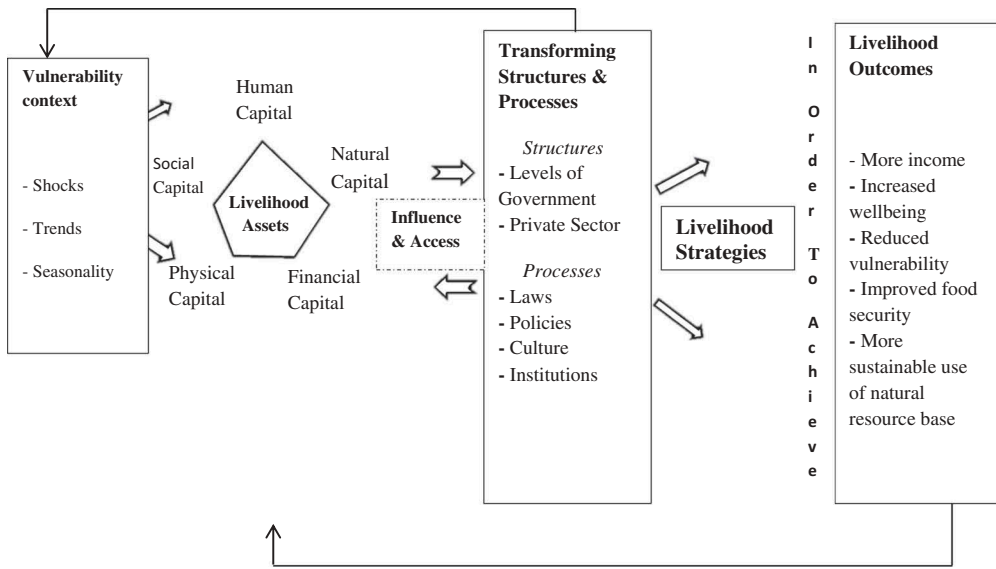


Figure 1. Sustainable livelihoods framework.
 Source: Department for International Development (DFID), 1999

a framework for analysing sustainable livelihoods using the vulnerability context, livelihood assets, structures, processes, strategies and outcomes as captured in Figure 1.

The DFID (1999) sustainable framework presents a number of factors that impact livelihood assets and also emphasizes relationships among these factors. Central to the model is a pentagon of livelihood assets that can be utilized for achieving livelihood outcomes through strategies that reduce the vulnerability of households and communities to shocks, trends and seasonality (Borrini-Feyerabend et al. 2004). These livelihood assets or capitals, namely natural, social, physical, human and financial capitals are important in reducing vulnerability and ensuring sustainable livelihoods.

While the natural capital refers to the natural resources useful for livelihoods such as land, water, wildlife, biodiversity and environmental resources, social capital refers to the social resources, including networks, relationships of trust, access to wider institutions of society of which people take advantage for livelihood empowerment (Chambers 1995). Carney (1998) adds that human capital refers to the skills, knowledge and health, which are important for pursuing different livelihood strategies, while physical capital refers to the basic infrastructure and the production equipment or means, which enable people to pursue their livelihoods. Financial capital, on the other hand, refers to financial resources, which enable people to pursue different livelihood options.

Other authors, including Bebbington (1999) and Ellis (2000), have also provided their models of sustainable livelihoods. Bebbington’s model differs from the others in terms of being linear and prescriptive. Bebbington’s livelihood framework places the individual and household access at the centre of five slightly modified capitals, namely produced, human, social, natural and cultural capitals. In contrast to the earlier authors’ view, social capital is seen by Bebbington to be a particularly important asset in providing access to other assets and actors.

Ellis (2000), on his part, looks at the concept of livelihoods from the angle of diversification for household survival. According to Ellis, these are predicated on five assets, to which access is modified by social relations, including institutions such as rules and customs, as well as organizations, including governmental and non-governmental organizations in a context of trends and shocks that affect livelihood. The livelihood strategies are composed of a variety of natural and non-natural resource-based activities such as fishing, salt production and tourism that ultimately have effects on livelihood security and environmental sustainability, while environmental sustainability also affects the sustainability of livelihood.

It can be argued that, all the perspectives of the sustainable livelihood framework are premised on the relevance of sustainable livelihood. The goal of the frameworks is to understand local livelihoods in order to influence livelihood strategies and outcomes to reduce household and community vulnerability to stresses and shocks for increased well-being (Hinshelwood 2003). Thus, the sustainability of the local environment is important so as not to undermine the livelihoods of future generations, and the role of environmental sanitation in ensuring this sustainability, is critical.

Arce (2003) has advocated that analyses of livelihoods of the poor should be done from their own perspectives and also indicated that coastal resources have been shown to have substantial impact on local people's livelihoods. According to Arce (2003) and Agueere (2014), the benefits of the sustainable livelihood theory include environmental management services, which can lead to ecological integrity, increased fish catches, improved tourism and environmental sustainability for improved livelihood through increased employment and income.

In relation to the above, Kyangwa and Odongkara (2005) carried out a study on sanitation and artisanal fish processing within the fishing communities of Lake Victoria, Uganda to assess the influence of sociocultural practices among fishing communities on use of sanitary facilities and artisanal fish processing techniques. The study used household survey, key informant interviews and focus group discussions (FGDs) to collect both quantitative and qualitative data for analysis. It emerged from the study that most of residents did not agree that their appalling sanitary conditions had implications for fish. However, the study concluded that the residents' waste disposal and defecation practices had fish quality implications as seepage from these sources contaminated the aquatic environment with fish spoilage bacteria.

In a related development, Agueere (2014) examined how rural tourism contributes to the enhancement of rural livelihoods in Paga in the Upper East Region of Ghana, using the sustainable livelihood framework which addresses livelihood assets, transforming structures and processes, vulnerability context, and livelihood strategies in order to achieve livelihood outcomes. The study used semi-structured household interviews, key informant interviews FGDs and observation to gather data for analysis. The study discovered that rural tourism provided employment opportunities to about 15% of the local people working in tourism related businesses. It concluded that rural tourism had the potential to enhance rural livelihoods and, therefore, there was the need to take measures, including improving sanitation, to realize the full potential of rural tourism.

Furthermore, using environmentally augmented panel dataset of 2009 and 2012 from four districts in Nepal, Walltign and Jiano (2017) assessed environmental reliance of households in different livelihood strategies in six districts in Nepal. The results showed

that majority of households subsisted in relatively lower remunerative livelihood strategies and the environment was important to all livelihood strategies or activities. The study concluded that environmental conservation and sanitation policies were critical in the study areas to sustain the increasing demands on environmental products and services for enhanced livelihoods.

The foregoing shows there is a linkage between sanitation and livelihoods, particularly for the poor. Safe sanitation leads to improved health which makes it more possible for people to take initiatives and utilize their assets for improved livelihoods. According to Borba et al. (2007) without safe sanitation and its resultant safe physical environment and improved health, the people might lack the energy and productivity to initiate and sustain relevant action to improve their living conditions at the individual, household and community levels, which will invariably affect their livelihoods

Materials and methods

The study was done in the catchment area of Benya Lagoon in the Komenda-Edina-Eguafo-Abrem Municipality in the Central Region of Ghana. It involved all eight communities in the area, namely Elmina, Bantuma, Bronyibema, Sanka, Essaman, Pershie, Mbofra Akyinim and Dwira Akyinim. The catchment area of Benya Lagoon is one of the few locations in Ghana where salt is produced on commercial quantities. Tourism is also an important economic activity, which is a source of employment and income and for that matter livelihood for a lot of people in the area (Dorkernoo 2013) and a source of tax revenue for the local and national government.

Data were obtained from varied sources through purposive sampling. The sources included local people who depend on fishing, tourism and salt production for their livelihoods in the study communities, as well as community-based opinion leaders and sanitation-related staff of the KEEA Municipal Assembly. Data were also obtained from experts in fisheries and aquatic sciences, tourism and hospitality as well as salt mining. The expert in salt production was a Professor of Chemistry in the Department of Chemistry of the University of Cape Coast, while the expert in fisheries was a professor in charge of fisheries and coastal management programmes at the Department of Fisheries and Aquatic Sciences of the same University. The tourism expert, on the other hand, was the Head of Tourism Staff (Museum and Monuments Board) at the Elmina Castle and Fort St Jargo at Elmina which have been designated as world heritage sites.

Two types of instrument, namely FGD guide and in-depth interview guide were developed and used for data gathering. The instruments contained questions mainly on the effects of defecation and waste disposal practices in the area on the three livelihood activities, namely fishing, tourism and salt production, and the implication of these for people whose livelihoods depend on these economic activities. That is, the effects of sanitation on livelihoods were posed as questions to people who eke out a living from the three livelihood activities, while similar questions were posed to the experts in the same livelihood activities to allow for juxtaposition and comparison of views on the issues at stake.

Training of field assistants, reconnaissance visits to the study sites, data collection and analysis took place from 26 December 2015 to 14 February 2016. Two research assistants, each with a master's degree in qualitative research, were recruited and trained to

assist with data collection. The training took 3 days – 2 days for actual training and 1 day for pretesting of the data collection instruments. The feedback from the pretest was used to finalize the instrument. In all, six FGDs were conducted. The focus groups, which comprised between 8 and 12 members each, were composed based on sex or gender and membership of specific livelihood activities such as fishing and salt production. Three FGDs were conducted for males and three for females. The male FGDs were conducted with fishermen at Bantuma, canoe and boat builders at Elmina, and salt producers at Bronyibema. The female FGDs were conducted with fish processors at Mbofra Akyinim, fishmongers at Pershie and salt producers at Dwira Akyinim. In-depth interviews were conducted with two officers from tourism and hospitality firms in the Elmina Castle and Coconut Grove Hotel respectively, a male assemblyman for Sanka and another one for Essaman, a Municipal Environmental Health Officer at the KEEA Municipal Assembly, an Administrator at Coconut Groove Hotel, 16 community opinion leaders (one male and one female from each of the eight communities), the chief fisherman at Elmina, an Executive Member of Salt Producers Association in the study area, and one expert each in the tourism, fisheries and salt production industries. Accidental sampling was also used to interview two open defecators who were spotted defecating at the beach near the lagoon and Elmina Castle, respectively after they had finished the act of open defecation. Data saturation (Walker 2012) was reached after collecting data from these respondents or participants.

All participants were adults. That is, they were 18 years or above. Every respondent's consent was sought through a signed or thumb-printed informed consent form depending on the level of literacy of the respondent. The consent was sought after explaining the objectives of the study to the participants and assuring them of confidentiality and anonymity. Data were recorded with the consent of the respondents and where permission for recording was not granted, copious notes were taken.

Additionally, observations were conducted guided by an observation checklist. The checklist contained items on issues regarding environmental sanitation and livelihood sources in the Benya Lagoon enclave. They included defecation and waste disposal practices, particularly open defecation and refuse dumpsites, tourist attractions such as the Elmina Castle and Fort, the Benya Lagoon and salt ponds. Documentary review was also done using the content analysis approach. Data were analysed manually under broad themes and presented in the descriptive narrative mode using the most significant stories approach. Where appropriate and needful, direct quotation of relevance from the respondents and photographs were used for illustrative evidence.

Results and discussion

The results are presented below in three segments. The first segment relates to sanitation and fishing associated livelihoods, while the second and third focus on salt production and tourism-related livelihoods, respectively.

Sanitation and fishing-associated livelihoods

As already indicated in the methodology, data on the issue of sanitation and fishing-associated livelihoods were solicited from people such as fishermen, fish processors,

fishmongers/traders, canoe and boat builders and juxtaposed with views of an expert, that is, a professor of fisheries and aquatic sciences. In a FGD with fish processors about the relationship between sanitation and livelihoods, the following emerged:

This is where we have been processing our fish. Although the environment is unclean, we always smoke and sell our fish without any complaints from any quarters. Since the world was created, filth has found its way into the lagoon and the sea as a result of floods and human activities, including sanitation practices but the sea and the lagoon still exist because they are resilient. Filth can affect our health but not our job as fish processors. What actually poses threats to the fishing industry and for that matter our livelihoods is the issue of operations of foreign trawlers and pre-mix fuel but not sanitation. Sanitation is important for our health but does not really affect our livelihoods as fish processors. (Female Fish smokers, Mbofra Akyinim, 2016).

It is learnt from this quote that the fish processors do not see the relationship between environmental sanitation and sustainability of the fishing industry and, therefore, do not associate the sustainability of fishing-associated livelihoods with the sustainability of the lagoon and the sea as natural capital or resource. Linking this to the sustainable livelihood theory, it can be argued that this contrasts with Carney's (1998) view about livelihood. According to Carney, a livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural capital base. It should be noted that, by making the point that the lagoon and the sea are resilient, the fish processors purport that the sustainability of the sea and lagoon cannot be affected by poor sanitation practices because the sea and the lagoon have the capacity to contain the waste forever. Contrastingly, Scheffer (2009) noted that, the ecosystem that we depend on is resilient because it is able to maintain its integrity or return to a state of equilibrium after a disturbance, but overburdening the system can cause it to lose its resilience and become unsustainable and, therefore, it is advisable to try to live within sustainable limits by acting and behaving responsibly.

However, in an interview with the fisheries expert, he debunked the argument that, these water bodies have unlimited capacities to contain all manner of pollutants forever. The expert's argument, unlike the fish smokers', supports Scheffer's (2009) argument and the sustainable livelihood theory's warning about visiting pressure on livelihood capitals such as the natural capital – in this instance, the sea and the lagoon – in a manner that renders them and their associated livelihoods unsustainable. The expert's submission implies that, putting stress on the natural capital – the sea and the lagoon – through improper sanitation practices, has the tendency to render fishing-associated livelihoods vulnerable and unsustainable. It is also clear from the quote that, although the fish processors linked sanitation to human health, they did not extend the linkage to human capital in terms of productivity, financial capital in terms of income, natural capital in terms of fish stock as well as other implications of sanitation for livelihood. However, in an FGD with canoe/boat builders at Elmina, they alluded to some of these connections between sanitation and livelihood as evident in the following submission by one of them, which was endorsed by the others.

I went to the hospital the other time when I was feeling feverish. The doctor said I had malaria. I was down for five days without coming to work. During this period, I did not only lose working time, which could translate into money, but also my daughter had to stay away from school to take care of me, apart from the money I spent on my treatment. I am

sure if we keep this environment clean; we will save ourselves from diseases that will affect our work, income and wellbeing (Canoe/boat builder, Elmina, 2016).

It can be gleaned from the two preceding quotations that, while the fish processors saw no association between sanitation and livelihood, the canoe builders did. An interview with the fisheries expert on the same issue reinforced the argument by the canoe builder. In the interview, the expert indicated that the relationship between sanitation and fishing-associated livelihoods should not be restricted to only the implications for health, but also productivity and income as well as the sustainability of the habitat for the fish or the fish stock. The expert noted that, poor sanitary environment can affect the health, productivity and income of the fish-related workers in particular and the fishing community as a whole. This is in line with Ahmed's (2003) conclusion that the impacts of improved sanitation on livelihoods include reduction in diseases, savings from buying medicine and visiting doctors, increase in labour hours due to reduction in sickness and increase in income.

The canoe builder and the expert's perspectives were consistent with George's (2008) observation that, poor sanitation leads to sicknesses, which in turn lead to low productivity and consequently, to poverty. George noted that when poor people fall ill, they lose income and may lose their jobs, spend scarce resources on treatments while other family members may have to stop working or attending school to care for the sick relatives. Furthermore, it is consistent with the DFID (1999) sustainable livelihood theory's implicit linkage between sanitation and human capital through health implications of sanitation as well as the financial capital through the income and productivity implications of sanitation. Additionally, in a FGD with fishermen at Bantuma the following was reported.

Some thirty to forty years ago, one could just stand at the edge of this lagoon, cast the net and catch plenty of fish. This is not the case these days. Last Thursday, I cast my net into the lagoon a number of times hoping to have a good catch so I could sell some and take the rest home for domestic consumption. Each time I was pulling the net, I realised that it was quite heavy so I cherished the hope that it was a bumper catch. When the net was completely out the lagoon, I noticed to my chagrin that, the garbage content was more than the much-expected fish. Thus, my commercial motive for undertaking that fishing expedition became dashed, and as if that was not enough, the fish I had for domestic consumption lasted for just two meals for a family of nine. When I narrated my disappointing story to my colleagues in a conversation, they had worse experiences on the same topic to share with me. One, therefore, cannot imagine the rate at which poor waste disposal practices is causing the garbage to take over the lagoon and the sea from the fish for which these water bodies are supposed to serve as natural habitat. It is not only unimaginable but also unthinkable. The government should do something about it because our livelihoods are at stake.

Although this came from a 62-year-old fisherman, the other discussants shared his experience and concern. This argument stems from the fisherman's further indication that when he told his story to his colleagues, they had worse experiences to share with him. Deductible from the quote is an illustration of a relationship between sanitation and fishing as a livelihood activity. Moreover, two assemblymen shared the view in separate interviews with them, that the fishing industry in the study area had the potential to create forward and backward linkages, which could also create more employment for the people. However, they acknowledged that, poor ESM practices

could whittle away these opportunities and reduce the chances for improved livelihood. This admission about the possibility of ESM practices reducing fishing-related employment opportunities implies that, fishing associated livelihoods are vulnerable to poor ESM. This is also consistent with Latterman's (2010) conclusion that overburdening the coastal resources such as the sea and lagoon could compromise their sustainability and affect their associated livelihoods. Relatedly, the fisheries expert revealed that poor ESM practices posed threats to the fishing industry in Ghana as a whole and the study area in particular. The expert opined that:

A healthy environment is important for fish production because polluted habitat is inimical to the growth of fish. Water quality is of great essence to fish production and so if the water bodies such as the lagoon and sea get polluted, the health of fish is compromised and their growth is impaired. This can lead to a reduction in the quality and quantity of fish produced. Pollution of the Benya Lagoon and the sea through indiscriminate waste disposal and defecation practices leads to poor water quality and damage to, or loss of aquatic life, thereby affecting the sustainability of the associated livelihoods.

The expert's observation reinforces a similar one by Aryitey (2016) that poor aquatic sanitary environment contaminates the fish stocks and results in loss of food security. The chief fisherman of the study area confirmed that sanitation has effects on fishing activities in the area because it pollutes the habitat of the fish and depletes the fish stock. According to the chief fisherman, the KEEA Municipality, particularly the catchment area of Benya Lagoon, has an enormous potential to become a leading area in fish production in Ghana if the right measures, including sound environmental sanitation practices are maintained. He added that, the poisonous substances kill the fish and even the non-poisonous garbage could still be a nuisance to the fish. It is gathered from this submission that, as implied by the DFID sustainable livelihood theory, the poor sanitation practices expose the fishing industry to ecological vulnerability, which translates into vulnerability of livelihoods instead of sustainability of livelihoods.

Sanitation and salt production-associated livelihoods

The sustainable livelihood theory (Carney 1998) requires that resources are used in a manner that will be beneficial to human now and in the future. In an FGD with salt producers in the study area, the discussants were asked about the implications of ESM practices for their livelihoods. Virtually every discussant talked about sanitation's effect on health but failed to link it to productivity, income and employment. The discussants' inability to do this linkage contrasts with the salt expert's linkage between sanitation for livelihoods, which included effect on job security, health, savings from buying medicine, time for work and for that matter income. By referring to the effect of sanitation on health, productivity, income, employment and the sustainability of the lagoon, the salt expert implied the effect of sanitation on livelihood assets such as human, financial and natural capitals.

Similarly, in an interview with a key informant from the Salt Producers Association, the interviewee indicated that sanitation could affect productivity and income through ill-health. This is consistent with the study on enhancing livelihoods through environmental sanitation by Sugden (2003), which concludes that the consequences of poor ESM include reduced fish production and revenue from water-based economic activities.

Others are effect on food security, health, income and productivity of those who depend directly on fishing related activities for livelihood. The informant, however, added that “chemically, salt is strong enough to withstand contamination but observed that it is unhygienic to find human excreta at the place where the salt is being produced”. This is what the respondent said:

Personally, I abhor the faeces and dirty environmental conditions under which salt is produced here although I am convinced that the chemical composition of salt makes it resistant to all manner of bacterial infection. Some of our customers have been complaining bitterly about this unhygienic environment, yet they buy the salt. As far as I can recall since my sixteen years of being in the salt mining business, there have been only two cases where the complainants about the unhygienic environment here did not come back to purchase the salt. However, it was unclear if their failure to come back was attributable to the filth, especially the faeces that they complained about. (An Executive Member of Salt Producers Association, Dwira Akyinim, 2016).

The informant opined that, the sight of filth in and around the salt ponds might have psychological effect on some customers, which might discourage them from buying salt produced in such an environment. According to the informant, this could decrease demand for salt produced in the area, culminating in not only loss of income but employment as well. This proves the linkage and relationship between sanitation and salt production-associated livelihood as implied by the sustainable livelihood theory. Another salt producer revealed that when it rained, the refuse and human excreta were washed into some of the salt ponds in spite of the walls that had been built around the ponds as embankment and protection as captured in [Figure 2](#). This, according to the producer, is a threat to the patronage of the salt produced in the area as it affects the quality of the product.



Figure 2. A salt pond at Bantuma.

Photo credit: (Mensah, 2016)

Another quotation below from the salt producers during an FGD illustrates how poor ESM practices in the area affect salt production, which is his main livelihood activity.

We have been engaged in the salt extraction business for over twenty years. It is from this business that our families and other dependents of ours eke out a living and, therefore, we are particularly concerned about the protection, development and sustainability of the salt industry. Water from the lagoon is the single most important raw material for the production of salt and, therefore, anything that does not augur well for the lagoon is a threat not only to the lagoon, but also to our livelihoods and survival. That is why we are unhappy with those who have been defecating in the lagoon area. Apart from the threat to the sustainability of the lagoon and its associated livelihoods for the future generation, the stench that one has to endure is unbearable and poses a threat to human health (Salt Producers, Dwira Akyinim, 2016).

The salt producers' concern for sustainability of the Benya Lagoon as a livelihood resource is consistent with the definition of livelihood given by Chambers (1995) as captured in the sustainable livelihood model. According to Chambers (1995), a livelihood is sustainable when it maintains or enhances the local and global assets on which it depends; has net beneficial effect on other livelihoods; can cope with and recover from stress and shocks; and provides for future generations.

Through an interview with the salt production expert, it became evident that poor sanitation has implications for salt production-associated livelihoods. According to the expert, salt is produced through evaporation and crystallization and so once the crystals are formed, the salt is pure. However, the expert added that, although the process of producing salt purifies the substance, in the process of collecting and storing it, the salt could be mixed with impure substances or contaminants. Besides, filling the lagoon with filth through improper sanitation practices threatens the sustainability of the lagoon and the survival or sustenance of people who depend on salt production for their livelihood.

The male salt producers observed during an FGD at Bronyibema that:

faecal pollution is one of the most serious challenges confronting salt producers in the catchment of the Benya Lagoon, but added that it does not affect the demand for salt because people buy the salt in spite of the poor sanitary environment.

In addition, observations revealed that, in communities such as Mbofra Akyinim, Pershie, Bronyibema, Dwira Akyinim and Bantuma, refuse dumps and public toilet facilities were located near the sea or the lagoon. This had resulted in waste materials being washed into these water bodies during heavy rains, thereby polluting them. Furthermore, through observation it became evident that some residents rear pigs near the Benya Lagoon. The pigs feed on garbage in and near the lagoon (Figure 3), leading to a flow of waste from the pigsties into the lagoon, thereby polluting it.

It can be argued that the sanitation practices as reported by the salt producers, and confirmed through observation, are not consistent with best practices (McConille 2010) and also undermine the sustainable use of natural capital or resource (the Benya Lagoon and the sea) of the salt producers and fishermen and therefore, render the livelihoods of salt production and fishing-related livelihoods vulnerable. This supports the connection between environmental sanitation and natural capital or asset and the effect of this connection on livelihood as stressed in the sustainable livelihood theory.



Figure 3. Pigs feeding on filth in the Benya Lagoon at Elmina.
Photo credit: (Mensah, 2016)

Sanitation and tourism-associated livelihoods

As articulated under the methodology section, tourism is an important economic activity which is a source of employment and income and for that matter livelihood for a lot of people in the catchment area of Benya Lagoon (Dorkernoo 2013). This is due to the presence of a wide range of tourists attractions, prominent among which are the St George Castle and Fort Jago in Elmina, which are world heritage sites. In an interview with a key informant at the Ghana Museums and Monuments Board at Elmina Castle, it became evident that the castle attracted over 100,000 visitors annually, out of whom approximately half were foreigners. The informant emphasized that although tourism was already contributing to the local economy, further development of tourism was important in order to entice tourists to stay longer and spend more money locally so that the local people could benefit more from their heritage assets through more jobs and increased income for enhanced livelihood.

However, this study revealed a general lack of awareness of the benefits of tourism and how the communities could exploit tourism for enhanced livelihood. From an interview with an expert in tourism at the Museums and Monuments Board, Elmina, it was discerned that the perceptions of the residents in the area with regard to tourism were generally unhelpful. According to the expert:

As far as many of the communities and residents in the catchment of Benya Lagoon are concerned, tourism is an activity for the government, tourists and other people, not them. Elmina is attractive to tourists due to its history and the presence of the world-class monuments such as the castle and fort but the residents are largely unconcerned about the actual and potential benefits of tourism, including employment, income and recreation. This is evident in their EMS practices, especially with respect to indiscriminate defecation and waste disposal practices. They neither see nor care about the essence of providing the sanitary and environmental attractiveness that is needed for tourism to flourish (An expert in tourism, Elmina Castle, 2016).

The expert's evidence suggests that, although Elmina is attractive to tourists, the insanitary conditions could reduce the benefits that could be derived from tourism. This is consistent with Tizser's (2010) observation that, no matter how attractive a tourist site may be, insanitary conditions have the potential to reduce the frequency of visits to the place.

A visit by the principal investigator to one of the hot spots of tourism attractions in the study area – the area between the castle and the sea – confirmed the general low level of awareness about the importance of tourism in the area as the tourism expert had hinted. Through observation, it became evident that, this area had been converted to a place of convenience by some residents and itinerant population. Open defecation was practised at this place with careless abandon. Interviews with some of the people who were seen defecating around the castle yielded interesting responses about open defecation in the study communities. One of such typical responses is quoted here to illustrate this point.

I do not have a toilet facility in my house, and unlike the public toilet, which is almost always unclean and smelly, the air here at the beach is fresh and so I feel more comfortable defecating at the beach than using the public toilet (A 45-year old male open defecator- Elmina, 2016).

Another open defecator who was interviewed had a similar reason for defecating at the beach and showed similar level of lack of concern about the effect of open defecation at the beach. While the reference to lack of access to toilet facility in the house is consistent with the observation by WHO/UNICEF (2010) as the cause of open defecation, the unacceptability of the practice, especially in tourist attraction sites, supports Sessey's (2007) conclusion that the cost of environmental damage due to sanitation includes discouragement of the tourist trade. Asked about the health and tourism implications of open defecation, the respondent had this to say:

The faeces here will soon be washed away by the sea and so the health implication is out. Concerning the effect on tourism, I know the tourists have designated routes that they use to visit the places of interest, which normally exclude where the open defecation takes place so it does not affect tourism.

Contrary to this respondent's view that the indiscriminate defecation practices do not affect tourism, it has been argued that poor environmental sanitation practices are inimical to tourism promotion and its associated livelihoods (Simpson 2007; Aboagye, Frimpong &

Eshun, 2013). A key informant at the Museums and Monuments Department at the Elmina Castle and another at the Coconut Grove Hotel, Elmina, revealed in separate interviews that, tourists have been seeing and expressing disgust about open defecation and indiscriminate dumping of waste within certain portions of the study communities, especially around the castle and the Benya Lagoon. According to the informants, some of the tourists take pictures of the nasty scenes in the area (see [Figure 4](#)). It can be argued from this piece of evidence that the practice is an affront to the dignity of the people in the area and bad for tourism promotion for improved livelihood and sustainable development.



Figure 4. Tourists on the Benya Lagoon taking pictures of the environment.

Picture Credit: (Mensah, 2016)

An expert in tourism and hospitality industry also had this to say about the relationship between environmental sanitation and tourism.

Environmental sanitation has a great deal of relevance for the tourism and hospitality industry. Health is every tourist's prime concern and so any suspicion of an outbreak of disease such as cholera, typhoid or malaria at a given tourist site will negatively affect the number of tourists visiting the place. Elmina's poor sanitary environment as exhibited by its choked gutters, improper disposal of waste and the common practice of defecating along the beaches and in the lagoon create an aesthetic embarrassment to tourists. This reduces patronage of tourism sites. It could lead to a shrinking of both the local and national economies and for that matter increase in poverty. Apart from that, when any member of our staff suffers from any sanitation-related disease and is unable to report for duty or work well, productivity and income could reduce. The youth complain about unemployment yet potential opportunities abound here in the areas of tourism, fishing and salt mining, but their own attitudes pillage them the opportunities.

The expert's observation is consistent with Dorkernoo's (2013) conclusion that sanitation has implications for productivity and patronage of tourism sites, which in turn, affect income and employment. In addition, it emerged from documentary review, Elmina Strategy 2015, that, on their usual short route between the castle/fort and areas around the Benya Lagoon, which is of so much interest to most tourists, the tourists often find them distraught by the unpleasant surroundings (see [Figure 5](#)) and complain about it.



Figure 5. Unhygienic sanitary scene near the Benya Lagoon between Elmina Castle and Bantuma.
Photo credit: (Mensah, 2016)

This implies that the poor sanitary environment in Elmina and its surrounding communities is a threat to tourism development and its associated livelihoods. The finding corroborates the observation by Lange and Jiddawi (2009) that improper sanitation practices in Zanzibar could threaten the water quality and ecosystem integrity, thereby impacting negatively on fisheries and tourism and their related livelihoods.

An administrator at the Coconut Grove Hotel at Elmina added another dimension to the implications of environmental sanitation in the area for tourism and hospitality industry as a livelihood opportunity. The informant disclosed in an interview that, the poor sanitation practices in the catchment area of the Benya Lagoon have both direct and indirect impacts on the operation and sustainability of the hospitality industry, including the Coconut Grove Hotel. The informant noted that the tourism and hospitality industry is an image business so what people see and hear about it form part of their impressions and judgement about the place. Several factors, including the physical environment make the visitors decide to stay and also inform other people to choose the hotel for several purposes. The informant hinted that sanitation within the catchment area of the Benya Lagoon detract substantially from the credit they get from their customers and even reduce patronage of the hotel. According to the informant:

The pockets of shanty squatters around the Benya Lagoon, the drying of stinking fish with its associated foul scent as well as the faeces and garbage around the place pollute the air. In the afternoons, our visitors or guests complain a lot about the foul scent, which often has a nauseating effect on them. The insanitary conditions have the potential to drive customers away, which could lead to reduction in employment of labour and loss of incomes to a number of people whose livelihoods depend on this industry in the area.

As implied by the informant, the unpleasant smell, health hazards and the aesthetic repugnance associated with these shanty spots, have the potential to affect negatively the productivity and sustainability of the hospitality industry. This evidence supports the finding by Aboagye et al. (2013) that an unsightly sanitary environment poses aesthetic discomfort and repugnant smell to tourists, which could reduce the patronage of the tourism sites in the area. It can be argued that, apart from the productivity and dignity implications, when the demand for the services of the hotels falls as a result of the poor physical environment caused by poor EMS practices, total revenue will also fall and so will employment of labour. Once employment and incomes are affected, livelihoods also get affected. This is the implicit import of the main tenets of the sustainable livelihood theory and its implications for livelihoods and sustainable development.

Conclusion and policy implications

The paper examined the relationship between ESM and livelihoods from the perspectives of experts and other key informants, including residents whose livelihoods depend mostly on fishing, salt production and tourism and their associated activities. The main finding is that, ESM has implications for health, income, employment, productivity and ecological sustainability through sanitation's implications for livelihood assets, namely financial, natural, physical and human capitals. However, while experts in all the three livelihood activities shared the view that ESM practices had implications for the growth and development of fishing, salt production and tourism-associated livelihoods, some

local fisher folks, salt producers and other local residents did not really see the effects of ESM on these livelihoods. Thus, while all experts' perspectives supported the tenets sustainable livelihood theory, perspectives of some local residents undermined the same tenets and principles.

The conflicting ideas between the experts and non-experts regarding the importance of ESM for the salt, fishing and tourism-associated livelihoods could be attributed essentially to the differences in the respective viewers' levels of education. While the experts appreciated and analysed issues based on knowledge as informed by their high level of education, the perceptions of the local fisher folks, salt producers and others such as the open defecators, were mostly influenced by their ignorance due to their low educational background and traditional or cultural beliefs.

As established, the lagoon is a major source of livelihood to the local people as it provides economic empowerment to them through fishing, salt mining and tourism-related activities. The Local Council or the Municipal Assembly also derives revenue from these economic activities that are carried out in the area through collection of tax. Therefore, one would expect that, given the importance of this lagoon to the local stakeholders, all the needed efforts would be marshalled to keep the lagoon environment clean in order to ensure the sustainability of the local economy and livelihoods. However, this is not the case since the local people keep polluting the lagoon and its environment. Although the three livelihood activities can potentially offer an escape route from poverty in the communities in the catchment area of Benya Lagoon, poor community behaviour and practices have pillaged them this opportunity, while community members continue to indict "global capital and blame immigrants" for their high unemployment and increasing poverty. This set of circumstances, if not properly checked, presages a generally grim future for the communities, including a tendency to make alternative orientations towards promoting local economic development policy appear irrelevant, thus inducing a climate of resignation and despair.

The local residents' behaviour suggests that they are more less enemies of their own progress as they are likely to eventually become victims of their own circumstances, with dire implications for their livelihoods and those of future generation. This conflict stems from poor attitude on the part of the people resulting from their poor sanitation culture and low level of education as well as poor sanitation law enforcement regime on the part of the local government in particular, and the national government as a whole. In the sustainable livelihood theory, a livelihood is regarded as sustainable when it is able to cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. Sadly, the local people do not appreciate their vulnerability to the shocks and seasonality that their livelihood assets (the lagoon and good health) are exposed to through improper sanitation practices. They seem to be content with the little they struggle to get from their livelihood assets now without thinking about the benefits that improved sanitation would inure to them. Since they do not realize that their poor attitude to sanitation conflicts with their opportunities for better living standards through enhanced tourism, fishing and salt mining activities, they need to be educated on how their livelihood destinies are linked with proper ESM.

In conclusion, poor ESM has implications for the health, employment and income opportunities of the people and paints a gloomy picture for the sustainability of the

livelihoods of the people, thus supporting the main tenets of the sustainable livelihood theory. It is imperative for the local and national government to embark on intensive sanitation campaigns, education, advocacy and promotion as well as enforcement of sanitation laws in the area to protect the lagoon and the tourist attractions in the area for sustainability of the people's livelihoods. The sanitation behavioural change communication messaging should stress the implications of poor ESM for the sustainability of livelihoods. This is likely to engender acceptance of the message by the people and lead to the desired behavioural change. The messaging should also take into account the culture and traditions regarding respect for the environment as abodes for the spirits of the departed. Behaviour change communication messaging should concentrate not only on implications of sanitation for health, which border on human capital but also implications for other livelihood capitals such as financial, natural and physical resources. These should be complemented with provision of sanitation infrastructure such as domestic and public toilets and waste bins as well as strict law enforcement.

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