

Coastal Erosion Coping Strategies in Ada-Foah in the Greater Accra Region of Ghana

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DOI: <https://doi.org/10.5281/zenodo.6786863>

Published Date: 01-July-2022

Abstract: This paper seeks explore the various coping strategies employed by the coastal dwellers in Ada-Foah area in the Greater Accra Region of Ghana to survive the effect of coastal erosion in their communities. The paper employed qualitative case study approach. The paper mainly relied on semi-structured interview picture taking and observation as the main method of data collection. In all 30 participants were purposively sample based on their ability to respond to the interview and pictures of scenes of coping strategies adopted by the coastal dwellers were captured. The data collected was read severally for trends and categories to emerge. The result of this study has shown that the coaster dwellers in Ada-Foah area do everything within their powers, legal or illegal, to cope with the phenomenon of coastal erosion for survival.

Keywords: coping, coastal erosion, survival, accommodation, retreat, inundation, Diversification, Protection.

1. INTRODUCTION

According to Voydanoff, (1987) coping is “an active process in which individuals manipulates their roles expectation and behavior to deal with stressful situations” (Voydanoff, 1987: 187). That is all efforts put in place by people in order to handle any stressful event that might come their way without causing any harm to any member of the group. Coping strategies then, refer to ad hoc and reactive adaptations aimed at short-term survival, where social learning and institutional change are lacking (Smit & Wandel, 2006). Examples include land use change, changes in resource management, changes in assets changes in labour allocation (e.g., gender division of labour, migration), and changes in market relationships (Ruben, Kruseman, Kuyvenhoven & Brons, 2001).

A family coping strategy then, is the management of stressful situation or event by a family as a unit with no detrimental effect on any individual in that family (Boss, 1988). It is in any stressful situation that certain coping measures, methods or skills will have to be put in place in order to manage without causing harm to any member of that society. In line with this, Ricker and Brisbane (1992:75) indicate that “Coping skills refer to all the techniques that enable you to handle stress and conflict in life”. With this there is the need for one to become an effective communicator to communicate the situation to others for help, make informed decisions, accept the result of one’s own decision, learn to love learning, and develop positive outlook to life. Hence, Zinn and Eitzen (2002) postulate that “Strong families are well-equipped to cope with the problem they encounter”. Family members who view such stressful situations as an adventure and an opportunity to have new experience will adjust more easily, look for those who have live through similar situations and try to learn how they cope.

Coping is strongly gendered with women taking on greater responsibilities in the family and men resisting change (Parvin, Takahashi & Rajib, 2008). Together they work to provide food for the family. In every family every one works for its survival of the family and for surviving societies, there is the need for certain coping resources that can come from the individual and from the family to survive any economic hardship (Bowen *et al.*, 1995; Voydanoff, 1987; Ricker & Brisbane, 1992). The men normally rely on their main occupation which may be subjected to stress and shocks while the women on the other hand diversify their livelihood activities to enable them stand such stresses and shocks. The family coping resources on the other hand include cohesion, adaptability and willing to adopt nontraditional roles in the face of the changing economic circumstances (Bowen, Pittman, Pleck, Hass & Voydanoff, 1995; Voydanoff, 1987).

As such these challenges of the working world put a good deal of stress on families at all stages of the life cycle especially at the young couple stage (Olson & DeFrain, 2000). The young couple will have to seek to establish themselves with wives diversifying jobs after husbands were growing dissatisfied with their works. Those who can alter their strategies or priorities to cope with a change in a situation is said to have higher adaptability (Sasse, 1997; Galles & Levine, 1999). Considering adaptability as a supreme virtue, means those who can adjust their activities to cope with the circumstances of coastal erosion and who are quick and quick to compromise are admired. Coping in the face of coastal erosion and shoreline retreat can be grouped into shelter related coping strategies, livelihood related coping strategies and water and health related coping strategies.

Shelter-related coping strategies (SRCS).

Focusing on adaptation to the impact of global warming and sea-level changes on coastal systems, several coping options are usually identified but the three possible Shelter-related approaches mostly adopted include retreat, accommodation and protection (Nicholls 2003; Mclean & Tysban, 2001). Retreat, which implies that all natural system effects are allowed to occur and human impacts are minimized by pulling back from the coast. This approach involves no attempt to protect the land from the sea. Accommodation, which implies people continue to occupy the land but make some adjustments to avoid the impacts, for example, by elevating buildings, growing flood-tolerant or salt-tolerant crops. Protection, aims to protect the land from the sea so that existing land can continue, by constructing hard (or semi-hard) structures (e.g., seawalls, sandbags) as well as using soft measures (e.g., beach nourishment).

Protection strategy, which aims to protect the shoreline, is most often used as adaptation in coastal area where economic activities are highly concentrated. For instance, in Japan where most of the major cities and infrastructures supporting industrial production, power generation, transportation, fisheries, etc. are located in the coastal zones, the protection approach is the most important adaptation initiative (Kojima, 2000). For instance, in Fiji, most of whose population and tourism related infrastructure (e.g., towns, airports, and resorts) are currently located on coastal and low-lying areas, resorts commonly adapt to erosion and the risk of storm surge by building seawalls and planting coconut palms or mangroves. Such hard structures may be useful to some extent but may often cause erosion elsewhere, necessitating further erosion protection measures. For example, the construction of jetties to preserve the sediment and breakwater to reduce wave heights may cause erosion elsewhere (El Raey, Dewidar & El Hattub, 1999). Ali (1999) however, claims that planting coconut palms or mangrove along the coastal belt would help stabilize the land, create more accretion leading to more land, and also raises the level of land so that inundation by sea-level rise is reduced. Also, a variety of coastal management tools such as land use planning and zoning is frequently adopted since it is inexpensive to implement and usually acceptable to the locals (Moser, 2000).

Livelihood-related coping strategies (LRCS).

Sometimes communities have to cope by changing their livelihood strategies or land-management practices in response to changes in resources on which they depend (Moen & Yu, 2000). This means a change in the processes, practices, or activities to moderate or offset potential damages or to take advantage of opportunities associated with changes in their livelihoods. In many communities, these approaches are less expensive than major structural protection and are aesthetically more acceptable but depend on the available options with diversification as one of the major livelihood related coping strategy (Moen & Yu, 2000; Hass, 1999).

Livelihood diversification is the process by which individuals, families and group of persons construct a diverse portfolio of activities and social support capabilities in order to survive and to improve their standards of living (Ellis, 1998). Diversification is the process by which households construct increasingly diverse livelihood portfolios, making use of

increasingly diverse combinations of resources and assets (Niehof, 2004). Diversification widens people's options, reduces reliance on particular natural resources, encourages spatially diverse transactions, increases cash in circulation in rural areas, and enhances human capital by providing those who diversify with new skills and experiences an extra income. Much of this increase in options and flexibility is reflected in diversification, which some argue is the universal strategy for coping with livelihoods (Turner, Kasperson, Matson, McCarthy, Corell, Christensen, Eckley, Kasperson, Luers, Martello, Polsky, Pulsipher & Wood, 2003). Others argue that diversification is merely the outcome of coping or survival strategies (Reardon et al. 2001; Wood, 2003). There is no doubt that multiple motives prompt people to diversify their assets, incomes, and activities, as also observed by de Haan and Zoomers (2003). In essence, diversification involves the adoption of both traditional and non-traditional livelihood activities in the coastal communities and elsewhere to be able to cope with evolving hard times. Ellis and Allison (2004) suggest that diversification can assist the rural poor to relieve themselves from environmental and economic shocks, trends and seasonality and to be less vulnerable.

Narayan *et al.* (2000:45) posit that "poor people often have struggle to diversify their source of income and food" they work on land, in quarries and mines; they hunt down temporary jobs and sell on endless variety of goods on the street; they do piecework in factories and from homes; they patch together remittances; and they cultivate home gardens". This implies that with so few prospects for sufficient and reliable income, men and women are working harder and diversifying their livelihood activities with some of the women taking on works outside the home to make ends meet. The push to diversify, as a means of coping, even touches those with permanent employment – teachers, civil servant, mechanics and shop attendants (Narayan *et al.*, 2000). They always complain that their wages and salaries are too low to keep their families out of poverty, so they take on extra work for sustenance. In support, de Haan and Zoomers (2005) have also shown that the diversification of income sources has not been limited to the poor, but rather many individuals and households across different classes also rely on multiple sources of income. It for instance, holds that diversification of assets, income, and activities are often driven by multiple motives. Livelihood studies have also highlighted intra house hold differences, while arguing that spatial dispersion of household members often accompanies livelihood diversification.

In addition, Ruben *et al.* (2001) complement the assertion of Narayan *et al.* (2000) by adding that the income diversification efforts of most rural dwellers over the past decade have been directed at coping with daily needs amidst declining returns to livelihoods. For instance individuals and households who have experimented with new forms of livelihood, expanding their nontraditional income sources, while retaining their base in subsistence fishing have excelled. Even more various livelihood patterns are emerging, depending on historical, geographical and agro-ecological factors at local and national levels. Niehof, (2004) therefore indicates that there is an increasing awareness that diversification plays a strategic role in rural livelihood systems. The livelihood system is seen as an open system, interfacing with other systems and using various resources and assets to produce livelihood, with the household as the locus of livelihood generation. Diversification strategies are part and parcel of rural as well as urban livelihood, for many, however, the push to diversify income and assets is but a coping strategies that involves constant juggling and struggling.

Stinett, Stinett, Defrain and Defrain (1999) also find that wealthier households tended to have more diversified income streams; those initially more diversified subsequently experienced a relatively greater increase in both income and calorie intake; households with a greater concentration of assets were more likely to fall in their relative outcome ranking (as were female-headed households); and, initially less diversified households subsequently realized greater gains in income diversification.

The analysis of livelihood stresses and shocks in fishing villages shows that diversification is a commonly used strategy for coping and adapting (Marschke & Berkes, 2005). One way that diversification occurs is by putting time and effort into a series of unrelated livelihood activities, as a way of reducing overall risk (Allison & Ellis 2001, Turner *et al.*, 2003). That is, relying on different livelihood activities for survival. Livelihood diversification may be an important angle of poverty reduction (Ellis 2000), a strategy for risk mitigation (Turner *et al.*, 2003), or a coping or survival strategy (Reardon, Berdegue & Escobar, 2001). Diversification provides one example of a household strategy for coping and potentially thriving. A more coping system implies more flexibility, but coping systems are also defined as those able to maintain their integrity and reorganize while undergoing change (Holling, 1973; Redman & Kinzig, 2003; Walker, Holling, Carpenter & Kinzig, 2004). Ellis (1998) in his work on "Household strategies and rural livelihood diversification" concludes that removal of constraints to and expansion of opportunities for, diversification are desirable coping strategies which give individuals and households more capabilities to improve livelihood security and to raise living standards, especially in the coastal communities.

Another livelihood-related coping strategy to deal with change and uncertainty is to leave the village for strategic periods of time, or permanently. Migration is a strategy to cope with socioeconomic challenges such as shifting markets or deteriorating infrastructure, adopted by rural communities (Pereira, Queiroz, Pereira & Vicente, 2005; Mafa Environment and Development, 2003). For example, fishers may find that the way to enhance their livelihood and well-being is out-migration as paid employment options remain limited in coastal areas and migration to cities presents an important opportunity for some households to improve their conditions through remittances (DFID, 2009). Those left behind may cope with depopulation by abandoning land-based livelihoods and living off old-age pensions or remittances. Migration is a well-documented coping strategy in rural livelihoods around the world (Adger, 1999; Sporton, David, & Morrison, 1999; Campbell, Jeffery, Kozanayi, Luckett, Mutamba & Zindi, 2002; Korf, 2004). In Botswana, for instance, population migration was found to be a significant coping strategy employed by communities forced to deal simultaneously with both environmental variability and externally induced land-use change (Sporton *et al.*, 1999). Evidence from Sri Lanka (Korf, 2004) and Vietnam (Adger, 1999) suggests that households reduce their vulnerability by migrating, which enables them to use their different capital assets more efficiently. Households may, for example, draw on human capital, in the form of knowledge and skills, in order to increase financial capital by migrating in search of wage labour.

A third livelihood-related coping strategy is to resort to moneylenders. A strategy that is pursued because of a lack of alternatives (i.e., desperation strategies) tends to be very costly. Such a strategy often involve running down productive assets, create non sustainability, and leave people poorer and more vulnerable than they were before (Start & Johnson, 2004). Coping strategies may force people to make decisions favoring security and short-term gains, yet limiting potential future options (Wood, 2003).

Water and health-related-coping strategies (WHRCS)

Rainwater harvesting is perceived as being effective in narrowing the gap in drinking water availability between the “haves” and the “have-nots”. Rainwater collection could also play an important role in managing the severe public health problems, such as arsenic and fluoride contamination in wells or groundwater in Bangladesh, Cambodia, China, India, Viet Nam and other countries (Luong, 2002). Rainwater harvesting by rooftop catchments (using large volume cement jars and tanks) have proven to be sufficient for household use in most rural families in Thailand and for promoting family self-management of household water security (Luong, 2002).

As fetching water is related to women and children’s activities, and the cost of digging a deep well was high, local men didn’t have a great deal of incentive to push and mobilize the government to meet their needs. As a result, village women and children were forced to walk 14km a day during the dry season to fetch potable water at other villages where there is sufficient well water (UNDP, 2010).

Fishing communities living in the beach dunes of Garacad and Kulub were severely struck by the 2004 tsunami (Muthusi, Mahamud, Abdalle & Gadain 2007). The communities are wholly dependent on dug wells in beach dune sands for water supply. Along the beach, a thin layer of less dense fresh groundwater “floats” on denser salty marine groundwater. Wells are thus excavated to just below the water table to skim off the fresh groundwater. Boreholes and some springs are the main permanent water sources, but are very limited in number. Surface water supplies (dams, *berkads*, and rivers) are breeding sites for mosquito larvae and contribute to outbreaks of malaria (Muller, 1999). Miscarriages by women are also a widespread problem in areas where water sources are located at the sea cliffs or at distances far from residential areas (NCA, 2006). Water availability in Somaliland are dependent more on underground reservoirs than on surface water bodies, as there are no major rivers or other permanent surface waters in the country.

In spite of all this submergence along the coastal environment and its subsequent erosion and other hazards, the interest of people to inhabit the coastal environment stems from two reasons. On the one hand, people seek to understand how coastal landscapes and what processes are presently operating in these zones of interface between land and the sea. The other motivation is more practical, because coastlines are probably the most intensely used landscape for a variety of human activities in the coastal communities (de Blij and muller, 1993). These several human activities are being influenced by certain factors causing coastal erosion.

2. THE RESULT OF THE STUDY

Coping strategies for coastal erosion in Ada-Foah area.

In line with this, data were gathered through field observation and interviews with stakeholders. Analysis of the data shows that the residents of Ada-Foah adopt a number of strategies to cope with the problem associated with the phenomenon of coastal erosion and shoreline retreat. These strategies can be grouped into shelter-related strategies, livelihood-related strategies, and water and health-related strategies.

Shelter-related coping strategies.

The analysis of the data gathered through a combination of interviews and field observation revealed that, the residents of Ada-Foah adopt various coping strategies to protect their shelters and themselves against the forces of erosion using their abilities, resources, and knowledge. These strategies can be put into retreat, accommodation and protection.

Retreat

From observation it was noticed that the residents of Ada-Foah adopt retreat to cope with the disruption of the menace of coastal erosion and shoreline retreat. What this implies is that all natural system effects are allowed to occur and human impacts are minimized by pulling back from the coast (Nicholls 2003; Mclean & Tysban, 2001). This approach involves no attempt to protect the land from the sea but the residents relocating away from the sea. An interview with the assemblyman at *Lolonyakope* has revealed that retreat is the common strategy adopted by residents of Ada-Foah in order to cope with the problem of erosion in the area. Pointing at a remnant of a house closed to the sea, he said “that is where I was living before moving to this new place”. Also at *Totopey*, Kofi Mensah a fisherman who participated in the interviews pointed to some houses beyond the *Songor* lagoon and said: That is where we are now. We only come to fish and go back”. He went on to explain that because there is no longer a land space to relocate, they have decided to cross the lagoon to settle at over bank.

At *Otrokper* the chief who is the custodian of the land commented on inadequate land for further retreat. According to him, there have been several retreats by residents with the sea constantly claiming the land. “Our land is finished. Something must be done to stop the sea from coming” he said. An interviewed with the assemblyman at *Azizanya* on how they get enough land to relocate has revealed that the government through the Volta River Authority (VRA) who has been dredging the Volta River to fill the wetland areas thereby creating more land for them to relocate. He lamented that: “This year if it had not been a timely intervention of the VRA, we would not have a place to relocate”. Again, a fisherman who participated in the study told me: “As a result of continuous retreat we have now resorted to the construction of temporary houses built with available local materials”. He observed that these temporary houses can easily be removed or abandoned anytime there is flood. Plate 1 shows a photograph of the temporary housing system adopted by residents with the researcher walking out of them.



Plate 1: Temporary housing adopted by the coastal residents

Source: Field work (2010).

Accommodation

Another observed shelter-related coping strategy adopted by residents of Ada-Foah is Accommodation. This implies that the residents of Ada-Foah continue to occupy the land but make some adjustments to avoid the impacts, for example, by piling up soil around their houses, creating water channels, digging gutters and temporarily moving out to stay with relatives who are not affected (Nicholls 2003; Mclean & Tysban, 2001).

In an interview with AK, one of the fishermen at Azizamyia who was piling soil around his building at the time of the field work said: “We do this to prevent floods from entering our rooms”. At *Lolonyakope*, a fisherman commented on the construction of water channels and gutters to accommodate the problem. According to him it has become necessary for residents to construct water channels and gutters to direct the flow of flooded water into the Volta River and other water bodies. “This is the only means by which we can accommodate the problem” he said. He however, explained that the construction of such structures involves some physical constraints hence some households did not use gutters.

Another fisherman who also participated in the study said:

Although these gutters serve as death traps to our children and the entire community, we still have to maintain them for the purpose of (Interview with respondent- February 12, 2010).

An interview with a trader at *Totopey* has revealed that each time there are stormy waves, some residents take shelter in relatives’ houses or share houses with neighbors who are relatively at low risk. After any hazard, if needed, they repair or rebuild their houses with available local materials. She said:

During the last year flood I have to move my family and other valuable properties to a relative house. We stayed there for two weeks before going back (interview with respondent- February 12, 2010).

Again, a participant whose house has been besieged by the sea indicated that in order to cope with the problem of erosion there is the need to fill portions of the lagoon with waste materials washed to the shore by the sea in order to create some land for houses.

We are fishermen, fishing is our major activity, and we can’t live to settle far away from the coast. All the land we have had been washed by the sea. There is no land left between the community and the lagoon. What we can only do now is what you are seeing, to fill the lagoon to create land for ourselves (Interview with respondent- January 12, 2010).

Plate 2 on the next page shows a photo of how waste was used to fill the lagoon.



Plate 2: Photograph of waste materials used to fill the lagoon.

Source: Field work (2010).

Plate 2 shows a photograph of the lagoon site with a lot of rubbish and other waste materials used in filling the lagoon for more land. The houses on the right are the newly built ones which are occupied by owners.

Protection

Protection is the practice by trying to protect the land from the sea so that existing land can continue. This is done by constructing structures (e.g., groins) as well as using soft measures (Nicholls 2003; Mclean & Tysban, 2001). An interview with the officer from the CDDF has revealed that certain measures have been adopted in the past to protect the shoreline of Ada-Foah from retreating. He said for instance, some rock particles were used in the past to construct groins to protect the shoreline from erosion “But this has been destroyed by the stormy waves” he said. In another interview, the District Planning Officer has mentioned that presently researches are being conducted into the problem to find out the best protection method to adopt in the Ada-Foah area. He further added that that discussion is still going on, seeking assistance from government, Non-Governmental Organizations and the international community to protect the coastline of Ada-Foah. “But as to when ... I cannot tell” he said.

Livelihood-related coping strategies in Ada-Foah coastal communities.

Analysis of data gathered for this study shows that the need for cash, particularly to buy food and other basic necessities, as well as to pay medical bills and school fees, strongly influenced the choice of wage earning activities undertaken by the residents of Ada-Foah. In line with this, several coping strategies have been adopted by residents to protect their livelihoods from the phenomenon of coastal erosion and shoreline retreat. These strategies include diversification, unauthorized fishing methods, out-migration, use of properties, child labour and child trafficking and other illegal activities.

Diversification

From observations it has been revealed that individuals, families and groups of persons in the Ada-Foah area adopt a diverse portfolio of fishing and non-fishing activities and social support capabilities in order to survive the problem of coastal erosion and to improve their standards of living (Ellis, 1998). An interview with *Tetty*, a fisherman at *Azizanya* has revealed that fishing itself is a diverse occupation, with most fisheries in Ada-Foah being both multispecies and multi-gear in nature. He commented in *Dangme* that: “Ke pi Jo o he o jine wa ko da”. This means “we would have been useless if it had not been the Volta River”. According to him, most fishermen in Ada-Foah area resort to fishing in the Volta River and other water bodies around instead of the sea to cope with the problem of coastal erosion. “We use different methods and gears to fish from these sources” he said.

At *Otrokper* a fisherman who participated in the study submitted that some families have to diversify their economic activities to supplement whatever income they may get from the fishing in order to survive the phenomenon of coastal erosion. He said:

It is better that we do more than fishing in my household. My one son sells fishing gears and my wife sells goods from our home. My daughter helps with fishing and marketing our fish products. I sent my two sons to the city to try to find other work. For now, I continue fishing (Interview with respondent- December 5, 2009).

In addition, one of the fishmongers at *Otrokper* who had just arrived from buying fish at the time entered the house told me in *Dangme* “Papa, potɔ ye he. Ha ma joo ye he boɔ ko ne ma ye o no”. This literally means “Man, I am tired. Let me rest a little before I attend to you”. After a while she gave this narration on how she and her children cope with the current shortage of fish for fish mongering activities in the Ada-Foah area:

I let my third and fourth daughters learnt how to make beads instead of engaging them in the fish mongering. My sixth daughter had also learned sewing while I continued with the fish mongering activities with the first and second daughters (Interview with respondent January 20, 2010).

In addition, to the above one farmer who was feeding a lot of poultry birds at *Lolonyakope* said: “These birds are what I depend on for survival”. When asked to comment on this, she said instead of fishing, the most common livelihood-related coping strategy adopted in the Ada-Foah community is that each household tries to raise poultry which they sell to raise needed capital, even though they got relatively lower prices. Also, *Mawutor*, a middle age woman who has only returned from selling at the time of the field work took me to her store and said I was formerly smoking fish but I have now resorted to trading as the supply of fish and fish mongering activities have gone down. Another fish monger at *Azizanya* said women have to leave whatever they are doing for nearby communities in search of materials such as firewood, metal meshes and

cements to mould blocks for constructing a smoker called *Tsorkor Smokers*. They also need to clear an area of land, water it and cover it with sand before they could dry fish for smoking. She said “Despite the difficulty, we still do it”.

Out-migration

From the data analysis, it was revealed that a noticeable seasonal out-migration in search of jobs has become part and parcel of residents of Ada-Foah. In another interview conducted at *Otrokper*, a fishmonger has indicated that people actively looked for alternate employment opportunities as the opportunity to earn cash within the same locality got dwindled “particularly when traditional employers and boat owners are also affected”. She further commented that majority of residents migrate to places like Togo, Cameroun, Tema and *Yeji*. An old woman who was once a trader and has ever been displaced said:

My son left for Cameroun at the time of displaced and has ever since visited only once ... I am now old and have nobody to take care of me (interview with respondents- January 28,2010).

Burger, a fisherman at *Azizanya* who has just returned from Cameroun some few years ago told me:

I left for Cameroun when fishing here in *Azizanya* had dwindled. I stayed there for 8 years and visited home three times. I sent money home through a friend who has a bank account (Interview with respondents- February 4, 2010).

Use of unauthorized fishing method

From the data analysis, it was found that residents of Ada-Foah adopt the use of unauthorized fishing methods to cope with the problem of coastal erosion. An interview with one of the captains of a boat with the inscription: *See me so*, at *Totopey* has revealed that residents of Ada-Foah are using unauthorized net mesh to fish in order to catch all manner of fish. He said: “the days of using the authorized net mesh is gone”. When asked to comment on this he said in the past there were a lot of fish, hence any net mesh type could give a good catch of fish. “Even spears were used to catch fish” he said.

At *Otrokper*, a fisherman comment on the use of light and generator for fishing as a coping strategy adopted by residents. His comment was that residents of Ada-Foah adopt the use of light and generator for fishing in order to have a good catch of fish. According to him the light attracts a lot of fish which they trap to have a better catch than when they were not using light. “Although it is illegal to use light and generator to fish; we do it only to survive with our children” he said.

As regards fishing activities at the beach, a boat owner at *Otrokper* told me fishermen would have to look for stumps of trees to be implanted along the beach to enable them fasten the ropes. Local ramps are constructed at a raised beach areas for pulling of boat in and out of the sea each time fishing is done. “This is time consuming and difficult as it needed to be done repeatedly” he said.

Defying restrictions

Data analysis has revealed that certain economic activities such as sand winning, block molding, fetching of mangroves and turtle hunting are banned in the Ada-Foah area, but poor households normally defy such restriction during extreme hardships. An interview with a middle age man at *Otrokper* who was once involved in the sand winning business said: “We are forced to defy such bans. However, most of us do this illegally, a fact which we do not want to divulge to anybody”. Again, a fishmonger at *Lolonyakope* indicated that the beach sand is what residents of Ada-Foah use for building and those who engage in it make some money out of it. He said: “Even though it is illegal, the beach sand is our cocoa. We can’t be here and be buying sand elsewhere for building”. At *Azizanya*, a fisherman commented on turtle hunting. His comment was that turtle hunting has become alternative economic activity to fishing for most residents of Ada-Foah. Most people hunt for the turtle to get some money to feed their families and cater for other needs. “We know it is illegal but we do it, only to be careful we are not caught” he said.

Child labour and child trafficking

From the analysis of the data gathered for this study, it has been found that residents of Ada-Foah adopt child labour and child trafficking as a way of coping with the problem of coastal erosion. An interview with a retired educationist at *Azizanya* who is much particular about the education of children, especially the girl child has revealed that children are also being used by their families to supplement their source of income. He said: “This is particularly disturbing where school children were being withdrawn from school and engaged as daily labour”. An interview with the assemblyman at *Otrokper*, who is a secondary school dropout further explained that some of these children are taken away from school for days or weeks

depending on the situation for fishing expeditions which at times force them to drop out of school. He said: I was the first born of my parents ... I drop out of school only to assist my father to cater for my younger siblings”.

An interview with a young redeployed pupil teacher who is now a fisherman has shown that some parents adopt child trafficking as a way to cope with the problem of coastal erosion. According to him, children in the Ada-Foah area are being loaned to other fishermen and relatives to be sent to places like *Yeji, Akosombo*, Togo and Cameroun to be engaged in fishing.

Use of property and savings.

Analysis of data collected for this study has shown that about 60% of residents adopt the use of properties and their savings as a strategy to cope with the problem of coastal erosion. An interview with a fisherman at *Otrokper* has revealed that residents of Ada-Foah sell some valuable properties that they have toiled to acquire at cheaper prices during periods of storm and floods. He said: I sold one of my small boats during the last year flood only to survive with my family”. Again, the chief of *Azizanya* said people primarily used whatever savings they have during the period of storm surges and erosion. “I was fortunate to have some savings last year, else...” he said. He told me those who had no savings or no property have been taking loans from relatives, neighbors, and moneylenders though people have claimed that moneylenders charge high interest rates. He however, explained that during these events, most of these relatives and neighbors also had to face similar socio-economic crisis which makes access to loan a bit difficult.

An interview with a farmer at *Otrokper* has revealed that residents of Ada-Foah adopt the strategy of leasing out their coconut trees and harvest of premature coconuts before they are taken over by coastal erosion and shoreline retreat. Another farmer at *Lolonyakope* who participated in the study noted that he is now relying on his children for survival and takes up fishing as a hobby. He told me:

With my four sons working in Accra the family has managed to have some savings. Many families around me became economically better off only after one or two sons started working in Accra. Those who could not do so became poorer and find it difficult to cope with the current situation (interview with respondent February 10, 2010).

Reducing consumptions and social obligations

From the analysis of the data gathered, it has been found that about 85% of residents of Ada-Foah reduce their food consumptions and social obligations to cope with the problem of coastal erosion. In an interview with a statistician resident at *Totopey* indicates that nowadays, parents had to cut down food intake to cope with the situation by resorting to eating foods that could only help match the demand with restricted supply situation. “Their diets were mainly consisted of food items which were insufficient in terms of vitamins, protein, and minerals but only to enable them to cope with the problem” he said. Again, fish monger at *Lolonyakope* has revealed that those with no access to any food adopt sleeping therapy with some usually are forced to resort to starvation - sometimes only one meal a day or nothing at all.

An interview with the chief fisherman at *Lolonyakope* has revealed that about 75% of residents of Ada-Foah reduce their social obligations such as not taking part in communal activities, not taking care of the aged and other relatives, non-payment of dues; postponement of marriage and funerals and other strategies to cope with the problem of erosion.

It could be observed from the data above that some fishermen in the Ada-Foah area are using unauthorized fishing methods in order to cope with the current situation. Children are also being used by their families to supplement their source of income. Also a noticeable seasonal out-migration in search of jobs has become part and parcel of the people in these communities.

Water supply and health-related coping strategies in Ada-Foah community.

Analysis of the data gathered for this study has revealed that residents of Ada-Foah adopt different coping methods to have safe drinking water and to avail themselves to treatment in case of sickness. These strategies include reliance on nearby communities, harvesting of rain water, sinking of wells and reliance on sachet water. An interview with one of the fish mongers who was just ready to go out for water at *Otrokper* told me people needed to walk long distances to collect water and more than half of the households affected needed to do it. She said:

We don't have any potable drinking water . . . We have to go out and look for good drinking water from the nearby communities (Interview with respondent- february18, 2010).

At Azizanya, *Korkormami*, a trader commented that “harvesting and storing safe drinking water from the rains has become a common practice among the residents of Ada- Foah. She explained that during the rains, resident collects water from eaves of roofs each time it rains to fill every container for storage. She said: “We suffer for water as soon as the rains are over and we empty our containers”. Also, the assembly man at Lolonyakope submitted that about 60% of residents of Ada- Foah adopt the use of the filtrated sachet water popularly called *pure water* for water consumption. He said: “Getting money for it is rather our problem”.

Pointing at an object at a distance, another farmer washing her bowls at Totopey told me: “that is where we get our source of water”. She said it became necessary to drill wells using lorry tires to cope with the water problem here. Figure 3 shows a picture of a well drilled at Totopey.



Plate 3: A well drilled at Totopey in Ada-Foah

Source: Field work (2010).

Plate 3 shows a well which was made by digging through the sand to an appreciable level where water could be reached. Then some lorry tires are arranged on top of each other from the bottom to the top. Water obtained from this type of well is not good for drinking but only for household chores.

Data analysis also indicated that about 80% of residents in the coastal communities of Ada-Foah adopt herbal treatment and treatment from Local Medical Assistant and Family Planning workers as a coping strategy for health related problems. An interview with a fisherman at Totopey has revealed that most people have resorted to herbal treatment using indigenous knowledge instead of the hospital. When asked to explain why, he said it is difficult to access a hospital; the hospitals are located far away from us. While at *Azizanya* a trader interviewed said: “We don’t have the money to pay for hospital treatment”. Also at *Totopey*, Kofi Mensah, a fisherman who participated in the interviews pointed out that most people usually do not seek treatment until the illness becomes severe and those who could afford to pay, sought treatment from Local Medical Assistant and Family Planning workers in the communities.

It is seen from the data that the use of filtrated sachet water popularly called *pure water*, harvesting and storage of rain water has become a common practice among residents of Ada- Foah area. Also, being rural poor, people usually do not seek treatment until the illness becomes severe. If needed, most of them took an herbal treatment using indigenous knowledge and those who could afford it sought treatment from Local Medical Assistant and Family Planning workers.

3. CONCLUSION

Residents of the Ada-Foah community employ various strategies to protect their shelters and themselves using their abilities, resources, and knowledge to cope with the changing conditions created by coastal erosion. The main shelter related coping strategy adopted by residents in the Ada-Foah area could be classified into retreat, protection and accommodation. River fishing has become the major coping strategy adopted by fishermen in the Ada-Foah area. Some households also defy certain restriction and engage in illegal livelihood activities during extreme hardships to cope with the ongoing phenomenon of coastal erosion and shoreline retreat.

Seasonal migration in search of jobs has become part and parcel of the people in these communities. Child trafficking and child labour are also being practised by families as means of supplementing their source of income. Some parents diversify their livelihood activities by engaging in petty trading and keeping of poultry birds while others drastically cut food intake, expenditures towards family festivals while those with no access to any of these alternatives usually face starvation situation. Harvesting and storing clean drinking water from the rain and the use of filtrated sachet water popularly called *pure water* has become a common practice among the people in the Ada- Foah area. Also, the rural poor usually do not seek treatment when they are sick until the illness becomes severe whilst others resort to herbal treatment. Others fall on the services of workers of health facilities privately for a lower cost.

❖ The coping methods adopted by residents of Ada-Foah should be supported and guided by local governments and NGOs to make it both more effective and environmentally friendly (e.g., proper knowledge of water storage before hazards occur and methods to reduce water-borne diseases in drinking water.

❖ The Coastal Management Policy and Development Strategies (CMPDS) of the government should incorporate the method of coordination and partnership among the development efforts of government, NGOs, and local communities. This would help in taking pragmatic actions. This involves the integration of community's perception and better coping methods.

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