

## **Flood Solutions Dialogue for MMDAs and Stakeholders**



**6<sup>th</sup> August, 2021**

**Tomreik Hotel, Accra, Ghana.**

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## Opening

The Flood Solutions Dialogue for MMDAs and Stakeholders was held on 6<sup>th</sup> August 2021, at Tomreik Hotel in Accra. The meeting brought together officials from Municipal Assemblies in Accra, the National Disaster Management Organisation (NADMO) and the Ghana Fire Service to discuss flood issues and to find solutions to challenges faced by MMDAs in tackling in the Greater Accra Municipal Area (GAMA). In this forum CDKN aimed to initiate a dialogue amongst MMDAs and also coordinate the use of Nature based solutions in solving the flooding challenges faced by MMDAs. There were 60 participants from which 19 were females and 41 males. The MMDAs present were Adentan Municipal Assembly, Ga East, Ga Central, Tema Metropolitan Assembly, Accra Metropolitan Assembly, LaNkwantanan Madina and Kpone Katamanso.

The meeting started at 9:30 am. The facilitator Dr. Felix Addo-Yobo welcomed all participants to the meeting. And stated all COVID prevention protocols that need to be observed. All participants present introduced themselves and the institutions they represented.

## Overview of CDKN

A video on the operations of CDKN was showcased to the participants as a way of introducing CDKN as an organization. Miss Charlotte Scott the regional coordinator for the Africa Programme and Miss Yoliswa Molefe presented on the CDKN Knowledge Accelerator Programme. The presentation included, the aim of CDKN, which is to support decision makers in designing and delivering climate compatible development.

The video also gave a brief description of the funders and the organisations involvement in other continents and the focus countries. The vision of the organization is to enhance the quality of life and resilience for the poorest and most vulnerable to climate change, including women and girls through gender responsive, socially equitable and climate resilient development. This is achieved through three pillars, knowledge, engagement and peer learning. CDKN works across four themes, Water, energy and food nexus, Cities, Climate Finance and Gender and Social inclusion.

## Presentations

### Ecosystem based Approaches for Disaster Risk Reduction-Plan for AMA Area

By Mr. Kwame Fredua, Environmental Science Class on Eco-DRR (IESS)

Ghana has experienced disasters, like we see in China, France, Germany and some other countries now. The PhD students focused their work within the Greater Accra region. They looked at how incidents of disaster (natural or man-made) affect the lives of people and properties. Some of the common disasters they realized are floods, fire, collapse of buildings, coastal erosions and many more.

The UNISDR (2009) tries to define what disaster risk reduction is, and it is basically trying to anticipate and reduce the risks of disasters. This then suggests that we cannot prevent entirely disasters (especially the natural ones), but what we can do is to anticipate and put certain measures in place to try and prevent them as they come.

The NDPC highlights the issue of disaster in the National Medium-Term Development Policy Framework (NMTDPF) for Ghana. NDPC notes in that document that, poor disaster prevention have a way of exacerbating the impacts of the {inaudible}

So the work of the PhD 1 students is trying to provide some solutions considering eco-based disaster approaches/nature based solutions as means to compliment the conventional traditional ways of disaster management. Nature based solutions (Nbs) are all the actions or mechanisms that seek to sustainably manage and restore natural and ecosystem that address societal challenges. These are ways that improve biodiversity and human wellbeing in general.

As far back as 1990, AMA has had various incidents of disaster within the metropolis; notably amongst these disasters are flood, fire outbreaks and collapse of buildings. Recently in 2021, there was fire outbreak in Makola in Accra.

There is a national disaster management plan for the country. The 2010 national disaster management plan is what has been used, and it captures most of the underlining issues concerning disasters in the country. From this document, AMA is supposed to localize or situate it within the metropolis to be able to work on their specific problems. Unfortunately, since 2010, a lot of issues have come up in Accra and there haven't been any proper intervention.

The core objective of the study was to **examine how nature based solutions can be integrated in the existing traditional ways to deal with disaster management.**

Hazard and vulnerability assessment of the metropolis, and risk perception surveys were used in the study. Discussions and interviews with NADMO officials revealed some areas that are fire prone areas in AMA; Awodome, Mamprobi, Kaneshie etc. Questionnaires and interviews were also used in the methodology to gather data. A hazard risk analysis was done in AMA to identify the key disaster risks within AMA. A relative risk level of 28% was realized, which appears to be low compared to other countries. However, in terms of flood and fire, the risks were high. For vulnerability analysis, there are some things that when not tackled, will create

problems; inadequate response capacity of fire service, logistics, human resources, building in water ways and wetlands.

**Risk perception:** residents need to be talked to, to get their perceptions and ideas on disasters. People's understanding of the risks that disasters pose is a step to help in addressing issues of disasters. The PhD students realized that the residents have a fair idea on disasters, their causes and consequences.

The PhD students also realized that most of the residencies in AMA are not **insured**, residents need to **insure** their houses, shops etc.

The use of nose masks and sachet water is also one of the problems the PhD students found in AMA. Covid-19 indirectly is also contributing to the problems of disasters (nose masks).

## **Solutions**

### **Preparedness**

- Areas need to be marked out officially, documented, and disseminated properly to residents- indicating areas prone to disasters
- Institutions must work together.
- -Awareness and Education are very important.

### **Response**

- -What is our emergency response and unique management? Up till now, we are still using the 2010 disaster management plan, with no revision.
- -Disaster communication and information. We hardly hear information on disasters

### **Recovery**

- -Policy actions. How responsive the institutions are can facilitate good recovery.

### **Recommendations**

- -In relation to flooding, a lot of the Nbs work elsewhere; with the help of bioretention ponds, rain gardens, green roofing etc.
- -Flood early warnings. There should be more information on flood warnings. So, institutions like Ghana Meteorological Agency (GMet) should step up their responsibilities by sending out early warnings about heavy rainfalls.
- -Fire outbreak, public education and sensitization should be more.
- -Integration of Nbs into the districts' development plan. If there are resources allocated for the concept of Nbs, and there is proper planning, it will help to reduce disasters (especially flood)
- -Finances. Who is going to fund? Taking inspiration from the US that will invest about 9 million dollars in expanding its infrastructure, and investing more in green technology which will save them over 200 millions loss when there is disaster, Ghana can do same to prevent or reduce disasters which will prevent loss. Making the initial

investment to address issues of disasters is better than waiting to use more money after disasters have created so much loss.

## Nature based Solutions

By Prof Chris Gordon based on PlanAdapt Report for CDKN

The PlanAdapt Report on Nature Based solutions to flooding was commissioned by CDKN to find out how other countries such as Kenya and South Africa have dealt with the issues of flooding in their cities. The report was based on findings in four major cities in Kenya (Nairobi and Mombasa) and South Africa (Durban and Cape Town). The objective of the study was to **learn from similar examples from other African countries and enable peer learning between these countries.**

### Key Points of Interest

Causes of urban flooding

- -Climate change
- -Urbanization
- -Poor planning
- -Improper use of draining systems
- -Construction in flood plains
- -Heavy rainfall
- -Changing the nature of our soil by covering it with impeding structures

Recommendation/Interventions (Nbs approach)

- -rainwater harvesting
- -reafforestation
- -protecting and rehabilitation wetlands
- -river rehabilitation
- -mangroves

### Summary of Findings in the Report

#Kenya has recently started integrating nature based solutions to climate adaptation, disaster risk reduction across sectors.

#Ghana needs some sort of documentation that will be embraced by all, and which will be focusing more on looking unto nature to solve flood issues.

#There should be local level policy at each district. There should also be an engagement forum, where information can be shared including involving traditional authorities.

#We used to have a lot of mangroves in Accra. But they are now few, and have become a trap of plastics; the plastics are toxic to the mangroves

#There should be integrated network of emergency roads which could bring in logistics and also evacuating people. All districts must come to the consensus that some particular roads will only be reserved for emergency purposes; thus nobody is supposed to build houses or put up anything around such roads.

#Availability of lands to implement ecosystem and nature based solutions is a problem in Accra; there is virtually no greenbelt, everywhere in Accra has buildings.

## Plastic Waste Management in Adenta

By Dr Ben Ofori

Plastics are very common, and we all use them in our homes. Plastics are driven by urbanization; changing lifestyle and increasing population. This means that the use of plastics (sachet water bags, plastic bottles, polythene bags and many other plastics materials) is going to increase as time goes by. At the global level, the use of plastics is about over a millions of metric tons. In Ghana we have about 3,000 metric tons of plastics produced every day. The private source of plastic wastes is from the municipal waste, and there are specific studies to provide data on the composition of plastics in the general municipal waste. The case of Ghana is estimated to be 4%. Specifically for Adentan, which has a current figure, it is 24%. Some studies have suggested that in every municipality, town, village, city and the metropolis, there are plastics, sachet and polythene bags accounting for almost 35% of the Municipal's solid waste. A survey was done in Adentan in 2021, and it was realized that the average person consumes 6.5 sachet of water every day. So, if this is multiplied by the population of people in Adentan, we will have an idea of how much sachet waste is produced in the municipality.

The challenge is that, a relatively small proportion of the plastics produced is managed, about 70% is mismanaged; open dumping, burning, and some eventually leak into our water bodies. This is where the real problem is, the nature of plastics is such that they are easily carried by running water. They also impede the smooth running water into open water bodies.

Hierarchy framework developed by the world bank (a document which is yet to come out), suggests some interventions to reduce and substitute plastics; by redesigning plastics for recycling, increase plastic collection rates (which is been done and is encouraging), increase recycling capacity, meaning, there has to be more of collection because whatever is been collected will have to go to the recycling entities. Also, building and expanding safe disposal of plastics can be done. Or, we can ban the use of plastics, as Kenya and some countries have banned the use of plastics.

In 2017, based on the strategic plan of the vice chancellor of the University of Ghana, an initiative was set up and one of them is the student-lead initiate, University of Ghana Plastics Recycling Project (UGPRP). The primary goal of this project was to see to the management of plastic waste and to segregate plastics from the main waste stream. The specific objectives was to ensure waste segregation through the **promotion of attitudinal change**. So the entities involved in this project are the vice chancellor green strategic team, student groups (volunteers)- where the students have peer to peer education, pre-lecture sessions and room

to room education while IESS ensured monitoring, data gathering, evaluation, report writing. Then the buyers, who come to buy the plastic materials for recycling.

So there are baskets which had labels on them for empty bottles and empty sachet bags.



At the end of the data collection, there was just 6% of projected capacity. Only few people complied with the labels on the baskets; from the students' data, it was realized that many of the students mixed up the waste materials. The fault could be that there wasn't proper or enough management. The project was extended to the university staff village (where the bungalows and residencies of university staffs are)

### **Achievement of UGPRP**

- -It has helped in increasing the awareness on the importance of managing plastics. This was recognized by the Canadian high commissioner.
- -It has also helped to create businesses for some people who sell the plastics for recycling.

The idea of segregation by UGPRP was extended to the bungalows and residents of the university staff, yet the attitude is no different from that of the students. So if people of higher learning are not complying, how much compliance will the general population outside the university show? This makes the work of the sanitary officers more difficult.

What has to be done? There should be **law enforcement**. Students should be made to sign a *tenancy occupancy agreement* that if you are found not complying with the system that has been put in place to manage waste, you lose the opportunity to stay on campus.

If this project/program is extended to many other universities, schools and institutions, we will stand the chance of expanding the scope of managing plastic waste in the country and hence addressing plastic leakage which is one of the major causes of flood. The challenge of



the problem is in our hands and the way we manage plastics will determine how we are able to address the problem of flood.

## Q&A Session

### Question

1. Were traditional authorities involved in the study of EcoDRR of AMA.

### Response

The role of the traditional authority is very important. In the work, there wasn't really any engagement with traditional leaders. However, traditional leaders are key stakeholders.

### Question:

2. There are lots of research and most of them sit on the shelves. What is so special about your work that can be practicalized so that AMA can improve in its disaster situation?

### Response:

Answer: In this work, a lot of the issues are coming from the people, the stakeholders; EPA, Ghana Police Service, Ghana Fire Service, NADMO etc. There were conversations with these people. Unlike other works which are done by only literature review, this work is more of experiential, where people's views were sought. There was the need to experience the challenges on ground, so there were interview sessions, where the the mayor and NADMO representative of AMA were interviewed. The sustainability official of AMA was also engaged. So the concerns and 'inputs' of these officials were considered in the work. So the work is seeking to create a conversation with the current management of AMA by trying to integrate Nbs.

### Comments:

Kwame: UGPRP is a good initiative, we need to encourage many universities and institutions to also engage in this program/project. Also, the team members of UGPRP should continue the hard work and learn from their mistakes. There are similar experiences at EPA. EPA carried a pilot study within the ministries on plastic segregation and the response was similar to what UGPRP had. So we need to continuously do the sensitization and education because this is linked to **behavioural change**; some people change when they see value, others will change when they see the **incentives** or **punishment**. Generally in the society, some people will change because they know it is the right thing to do, others will change when they know the punitive measures will directly affect them. Also, from the pilot study done by EPA, the wastes are sometimes segregated, however, the collectors of the waste unfortunately mix up the waste. There's the need to promote the business aspect of waste segregation.

Jonathan: Talking about flood, especially in areas where there are lots of business; say market areas, most of these areas have been converted into storey buildings and the building constructors who come to build normally leave the sand for building on the roads. So, whenever it rains, the sand is carried away and it fills the drainage systems, which in the end results in flood.

Participant: Many people have cemented their houses, and rain waters are supposed to be absorbed by the soil, now when the place is cemented, how does the rain water get into the

soil? We need to encourage greening our frontages; plant nice grasses so that when it rains, the rain water is able to go into the soil.

Jonas Abladey {KKMA}: We could build storage facilities in the cities and in appropriate places, to collect excess water that builds up and results in flooding. These storage facilities could be underground, and the water could be used for recycling purposes and other purposes. When the water is properly treated, we can even use it as potable water. This is done in some places, we can also do it here.

Participant1: Looking at nature based flood management systems, we need to include some institutions in the scheme of **policy making**. For instance, the parks and gardens, and other departments that look at the ecosystems in Accra (landscaping) should be considered and involved when dealing with nature based solution.

Participant2: Preservation of wetlands, ramsar sites! Because the government hasn't acquired the wetlands for preservation, the chiefs end up selling the wetlands. The government must put in effort to acquire wetlands for preservation.

Participant3: In relation to giving out incentives, can we develop rewarding systems for plastic bottle disposable? Eg. When you are able to bring a number of empty bottles, you are given some incentives. For students, an app could be developed, where a student can take a picture with the number of empty bottles gathered and then post the picture with the app, accumulate points, and be rewarded.

#### **Using technology to promote incentives and recycling.**

Participant4: How do we intensify our education and early warning systems in the various assemblies?

Participants5: since the elderly ones are not able to comply with plastic segregation, can we consider the younger ones at the basic level? Can we push this agenda in their curricula to inculcate the discipline of complying with plastic segregation?

Dr. Ofori: Irrespective of the fact that compliance with the program/project of plastic segregation is poor, generally, the university of Ghana campus is quite neat. There isn't much littering, and the place is kept very neat. So, going forward, the UGPRP team is going to *intensify its educational and sensitization efforts*. UGPRP wants to sustain this project. This project has to work, the UGPRP team is committed and will make sure students comply.

## Breakout Sessions

The participants were put into **three (3)** groups. Questions generated by the participants for breakout group discussion are

1. What is the way forward to a sustainable stakeholder platform for GAMA
2. What approach is best for plastic and disaster management? Incentives? Punishment?
3. Which institution should lead? AMA? MMDAs? NADMO? Fire service? EPA? Who supports? Who reports to who?
4. What are the entry points for education? What sorts of topics? What ages? Formal/Informal? What sort of topics? What ages? formal or informal?
5. The role of Citizen Science (and traditional knowledge as a way of creating the evidence-based for policy and actions for disaster management

### Report from Breakout Groups

#### Group 1

Marian Quaye of Ga East Municipal Assembly reported on behalf of Group 1

#### **1. What is the way forward to a sustainable stakeholder platform for GAMA**

Having a sustainable stakeholder platform where all GAMA assemblies meet quarterly to commit to ways to manage flood will be helpful. In the various assemblies, there are existing committees that look into different kinds of issues. If all assemblies decide to come together to meet, there will be sharing of knowledge which will help the assemblies. By doing so, there will be exchange and ownership of ideas. For example if Adentan decides to do desilting in a particular period of time, the other assemblies can also do desilting in that same period of time.

When it comes to funding the committee, each assembly should contribute, with their MCEs, MCDs, heads of NADMO, EPA, traditional authorities etc.

#### **2. What approach is best for plastic and disaster management? Incentives? Punishment?**

Both incentives and punishment is needed. With regards to incentives, as a way of encouraging “plastic product companies” (such as companies that produce bottled water, bottled drinks etc,) to use innovative ways for plastic waste collection, there could be a **tax waiver** as a form of incentive to companies that will be able to use innovative ways to collect plastic wastes. Also, a form of an award scheme, where a company will be recognized for managing plastics very well.

The assembly can engage recycling companies, get individuals who bring plastic wastes to the recyclers and reward the individuals. So, the assembly can act as a “collection point” of wastes from communities

PUNISHMENT- There should be **instant fines**, instant community services, as well as name and shame. Example, during farmers day or whenever there is an activity in the assembly, a community in the assembly can be “shamed” for being dirty, and especially not managing plastic wastes well. A community can be praised too for managing wastes well.

#### **4. What are the entry points for education? What sorts of topics? What ages? Formal/Informal?**

Entry point for education on plastic management should start right from pre-school. The children should also be taught in the homes, they will grow with it. Worship centers (churches, mosques) should also be encouraged to segregate plastic wastes. Institutions and organizations should also segregate waste.

For children, as a form of educating them on plastic waste management, there should be animations and tools easily understood by children to teach them on the importance and consequences of waste plastic management/improper plastic waste management.

In the community, there could be community volunteers to aid in plastic management and segregations. The assemblies can use the information service department (eg. vans with speakers) to educate the community on the importance and consequences of {improper} plastic waste management.

Some topics to be considered for education on plastic waste management

- -waste generation management
- -environmental and sanitation
- -waste and disasters
- -waste and environment

#### **5. The role of Citizen Science (and traditional knowledge as a way of creating the evidence-based for policy and actions for disaster management)**

- -creating awareness
- -help shape policies
- -incorporation of traditional knowledge

## **Group 2**

Kwame of EPA reported on behalf of group 2

### **1. What is the way forward to a sustainable stakeholder platform for GAMA**

- -Strengthen collaboration and cooperation among the MMDAs. Some of the issues are trans-boundary; they emanate from one assembly to another. There is the need to use GIS related information; maps on the river basins and catchments.
- -There should be national plan/platform that MMDAs can draw from. There should be a national plan to manage flood and plastic wastes. There should be adoption of

effective environmental management strategies with NADMO leading, coupled with relevant MMDAs, GNFS, GPS, EPA

## **2. What approach is best for plastic and disaster management? Incentives? Punishment?**

- -Both incentives and punitive measures should be used depending on the factors in a community.
- -Education and sensitization is also very important, promotion on issues of behavioural change on the part of citizens. There should be a national and district waste segregation program. The churches and the mosques can help to implement these programs. The police should help in the enforcement, the court etc.
- -Incentives can be given to institutions, churches, mosques and markets for promoting plastic management. Incentives can be given to manufacturing companies like plastic related businesses. Also, incentives can be given to buyers who buy from plastic products. Example, Voltic can bring an initiative where buyers who come with a certain number of empty Voltic bottles are given commission.
- -Encourage investment into waste recycling infrastructure or systems
- -Involve traditional authorities and make use of local and traditional knowledge to compliment current conventional approaches that are being used.
- -A business case can be built around plastic waste management. It could be a collaborative venture between two or more MMDAs and some good revenue can be generated.

## **3. Which institution should lead? AMA? MMDAs? NADMO? Fire service? EPA? Who supports? Who reports to who?**

There are relevant legislation and legal framework already in existence. The only problem is they are not being implemented to the full because there are a number of constraints; resources (financial and logistical).

## **4. What are the entry points for education? What sorts of topics? What ages? Formal/Informal?**

- -Pursue formal and informal education approaches
- -With informal education, when there is opportunity for town hold meetings and stakeholder consultative fora, these platforms need to be used to educate and sensitize the public on plastic waste management, and then finally localize and practice the approaches in the community. Institutions like NCCEs, NADMO and GES have roles to play

## **5. The role of Citizen Science (and traditional knowledge as a way of creating the evidence-based for policy and actions for disaster management**

-Prioritize the use of data and evidence in disaster-related decision-making

-Citizen science driven by technology and innovation (smart phones, web applications etc.)

### **Group 3**

Benedicta reported on behalf of group 3

### **1. What is the way forward to a sustainable stakeholder platform for GAMA?**

Platforms for disaster management already exist, but they seem almost non-existent, so there should be **activation of existing disaster management platforms/committees** to make them more active. This can be done by giving them more projects to work on, this will encourage them to meet regularly to share ideas.

There should be prioritization of disaster management projects at the municipal and district assemblies. For instance, when there are projects that can generate revenue, the assemblies are quick to respond, however when it comes to issues of disaster management where sometimes funds are needed, the assemblies feel reluctant to come on board.

Also, there should be **capacity building** for disaster management committee members so that they are up to their tasks: physically, financially, and with logistics

There should be adequate and timely release of funds for disaster management.

### **2. What approach is best for plastic and disaster management?**

Both incentives and punishments should be encouraged.

#### Incentives

- -Tax relief for recycling companies. This can be a form of motivation for companies that manage plastic waste well. About 20-30% of the taxes paid by recycling companies can be slashed out to motivate them.
- -Polluter pay system. Anyone who pollutes should be held responsible
- -Award scheme for plastic waste collectors. This is already ongoing in some local communities.

#### Punishment

- -Restore the sanitary inspection system. The group also came with the idea of going back to the sanitary inspection system (“samagam”) - where inspectors used to go to homes to inspect and fine residents who do not keep their homes neat.
- -Extra charge for indiscriminate plastic waste disposal. Individuals who do not segregate their waste before disposing should be charged more

### **4. What are the entry points for education? What sorts of topics? What ages? Formal/Informal?**

- -At the basic level (class one). This is normally the time the brains of children begin to *mature*
- -Averagely at age six, where the children are able to influence one another and other people
- -The education should be both formal and informal. With informal, our way of socializing

## Closing

Dr. Felix Addo-Yobo expressed his satisfaction with the session, describing it as interactive, valuable, and enlightening. He highlighted that the discussions provided participants with significant food for thought regarding the way forward and the necessary actions to address the challenge of floods in various municipalities. Dr. Addo-Yobo emphasized the importance of establishing a common platform for MMDAs (Metropolitan, Municipal, and District Assemblies) and other relevant stakeholders to engage in discussions on development issues. He viewed this innovative partnership as a means to deepen and strengthen collaboration because no single sector or stakeholder possesses all the solutions, as evidenced by the insightful discussions during the meeting.



## Annexes

### Programme

#### Flood Solutions Dialogue for MMDAs and Stakeholders 6th August 2021 CDKN Ghana

Activity/Topic/Timeline	
Arrival of Participants and Registration	8:30 - 9:00
Opening Session	9.00 – 9:30
Welcome and Scene Setting Remarks: Dr. Felix Addo-Yobo (NDPC) Moderator Self-Introduction of Participants Overview of CDKN (Charlotte Scott – pre-recorded video)	
<b>Presentations</b>	<b>9:30 – 10:50</b>
<b>Ecosystem based Approaches for Disaster Risk Reduction-Plan for AMA area</b> By Environmental Science Class on Eco-DRR (IESS)	
<b>Nature based Solutions</b> By Prof Chris Gordon based on PlanAdapt Report for CDKN	
<b>Plastic Waste Management in Adenta</b> By Dr Ben Ofori	
<b>Community Based Participation</b> By Prof Martin Oteng-Ababio	
<b>Short Q &amp; A Session on Presentations</b>	<b>10:50 – 11:10</b>
Group photograph and Coffee Break,	11:10 – 11:30
<b>Open Discussion in Breakout Groups</b> <i>Based on questions from the participants on partnerships and how MMDAs and their units can collaborate to solve challenges of flooding</i>	<b>11:30 – 13:30</b>
<b>Plenary Discussions</b> <i>Report back from Breakout Groups focus on the Way Forward</i>	<b>13:30 -13:55</b>
Wrap up and closing by Moderator	13:55 -14:00
Lunch (Take-Away)	14:00

## Summary Concept Note

**CDKN Ghana**  
**Flood Solutions Dialogue for MMDAs and Stakeholders**  
**6<sup>th</sup> August, 2021**  
**Tomreik Hotel, Accra**

The capital city of Ghana Accra and its peri-urban areas have always suffered from annual floods during the rainy seasons. The current increase in flooding events can be attributed to poor drainage caused by lack or inadequate infrastructure – compounded by the few drains present underperforming due to plastic waste and rubbish in gutters, another factor is urban sprawl leading to unplanned and unserved communities. The third reason is an increase in the intensity and unpredictability of rainfall. This forum presents the responses taken by four different Municipal/District Assemblies to deal with flooding issues in their respective areas, after an introduction to nature based solutions discussed in 2019. Each Municipal/district is an autonomous unit when it comes to planning however the effects and impacts on one MMDA may equally affect another or even exacerbate the impact in neighbouring MMDAs.

A quantitative and qualitative studies carried out by the Institute for Environment and Sanitation Studies used an ecosystem-based disaster risk reduction lens to analyse flood-prone areas where water stressors create and compound disasters. Each municipal district assembly created a unique set of responses that fitted its developmental objectives and the vision of the Chief Executive. By analyzing and synthesizing the responses between the districts, elements of best practice can be deduced. The case is made for researchers and policymakers working together in a transdisciplinary manner to create practical solutions to flooding that meets the requirements of practitioners and is simultaneously innovative and flexible

This forum is a follow up and response to a request by MMDAs present at the 2019 workshop to have a platform to discuss flood matters and to find solutions to challenges among the MMDAs. In this forum CDKN seeks to initiate a dialogue amongst MMDAs and also coordinate the use of Nature Based solutions in solving the flooding challenges faced by MMDAs

### **Targeted participants**

- Seven MMDAs (TMA, AMA, Adentan, Kpone Katamanso, Ga-East, Ga-Central, LaNMMA)
- Academia
- NADMO