URAdapt

Managing Water at the Urban-Rural Interface: The key to climate change resilient cities

REPORT

URAdapt Accra Third Re-SAP Meeting.

Tuesday, January 18th, 2011

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Coconut Grove Regency Hotel, Accra.

1. **Welcome remarks**

The meeting commenced with an opening prayer by Dr. Philip Amoah of the International Water Management Institute (IWMI), Ghana. Dr. Liqa Raschid-Sally expressed her pleasure at the turnout and hoped it was an indication that, all stakeholders were working hard towards the achievement of the project's goals. She wished everyone present 'Afehyia Pa' as it was the first meeting in the year. Sean Doolan from the Netherlands Embassy/DFID was introduced as an additional speaker to the program. She hoped the meeting would be a fruitful one, and enquired whether the participants had any other comments or inputs regarding the agenda for the meeting, for which there was a general consensus to maintain the current agenda. Dr Raschid-Sally was optimistic the meeting would be completed by noon.

2. **Overview of progress**.

Dr Raschid-Sally began by giving a brief update on the project since the last meeting. She informed the group that since July when the whole platform last met, there had been a smaller meeting of the Consultative Group to discuss strategic directions and what influences climate change may have on economic growth and development for Africa and for Ghana. These meetings were designed as smaller brainstorming sessions to address specific issues pertaining to the broader questions that influence development which would help design the scenarios and give relevance to the findings .

Dr Raschid-Sally indicated that, a 2nd Re-SAP platform meeting had also been held in the 'sister city', Addis Ababa in August, 2010. There was also a Donor Program Advisory Board meeting of the Climate Change Adaption in Africa in Addis Ababa, to discuss the project outcomes to date and the constraints. Ideas and recommendations were also given at this meeting.

She also commented on Maija's absence from the project and her relocation to Ouagadougou. She opined the project and all stakeholders would miss Maija as she was instrumental in getting the platform going. She extended Maija's regards to all present.

Dr Raschid-Sally then touched on the framework of the project for this year. She explained that, the year was going to see more platform meetings as there were more results from research work conducted, which necessitates interactive discussions to help get the right strategic

recommendations at the city and national levels. According to her, there was also going to be, organized round table discussions with policy/decision making actors as a form of knowledge sharing exercise.

She then touched on the progress that has been made since the last meetings, on the technical aspects. This meeting would showcase the progress made on the Climate (change) Downscaling and the Hydrological Modeling with emphasis on the supply of available water along the basins. Subsequently and at the upcoming meetings, the Urban Water Modelling and more information on the exposure risks and vulnerability mapping work, being done by the IWMI would be discussed.

Dr Raschid-Sally concluded her remarks by touching on the project's focus on monitoring and reflecting on what was to be achieved; what had been learnt and the changes that had taken place in the knowledge and actions of stakeholders. She 'relaunched' the outcome mapping concept, as a guideline to assess this.

Farouk Braimah was invited to facilitate the first part of the program. He in turn invited Dr Amoah for the first presentation on an update of the outcome mapping as a guide for monitoring and evaluation of the project.

3. **Project monitoring and evaluation**.

Dr Philip Amoah gave a presentation on Participatory Monitory and Evaluation: Using Outcome Mapping as a Monitoring Tool.

He began by stating that, the main emphasis of the presentation would be on defining progress markers for this project and then going through an exercise of ranking. However, for the sake of some new participants, he gave a brief re-cap of his presentation from the previous meeting. According to Dr Amoah, every organization/project has some goals which it aims to achieve. Monitoring represents an on-going activity to track a project's progress against its planned tasks. It aims at providing regular oversights of the implementation of activities through routine data gathering, analysis and reporting. In all projects there is some planning and proposal development at the early stages regarding what was to be achieved (goals) and how this was going to be done. A series of steps are adopted which include inputs, activities planned, outputs, outcomes and impact. Of these usually the first three items are seen to be under the control of stakeholders. That is, the inputs needed, activities planned (e.g. workshops, seminars and field works) outputs (models, reports) can be controlled to achieve the goals. However, the outcomes and impact of these activities cannot be controlled or determined.

In order to measure the progress of the project, and the outcomes to be achieved, there had to be some progress indicators. The process involved is called out ome mapping. Under this, there are three main steps; intentional design, outcome and performance monitoring, , and finally evaluation planning, Each of these steps include further activities but focusing just on the first step, it includes developing a vision, and mission, identifying the boundary partners, outcome challenges, progress markers, strategy maps, organizational practice; The other steps involve monitoring priorities, and preparing outcome journals, strategy journals and performance journals.

For the purpose of this meeting, emphasis was more on vision, mission, boundary partners and progress indicators as a way of ranking the progress of the project.

According to Dr Amoah, these terminologies as used in outcome mapping are borrowed terms and have little in common with vision and mission statements used in strategic planning.
Vision under output mapping refers to an ambitious goal towards which the project will contribute. It also provides inspirational focus for the stakeholders of the project. Mission on the other hand describes how the program intends to support the vision and the set of activities through which the project will seek to do so. He explained that, vision statements as used in outcome mapping are a set of statements of the various objectives of the project that are put together. These collections of statements are important as it serves as a guide in setting progress markers.

Boundary partners according to him are those individuals, organizations or groups with whom the program interacts directly and anticipates opportunities for influence in the real world. So for this meeting, the boundary partners are the participants from the various institutions who have direct interactions with the people on the ground and are expected to transfer the knowledge gained from the discussions at the platform.

He also touched on outcome challenges as the behaviors, relationships, activities, etc of individuals, groups or institution which will change if the program is extremely successful.

According to Dr Amoah, progress markers represent the information that the program can gather in order to monitor achievements towards the desired outcome. In other words, indicators that assist in determining where the project is at any point, the indicators to use in determining how to achieve the goals and the way forward to achieving the goals are the progress markers.

After this, there was an exercise to rank a set of progress markers. On a scale of 1-5; where 1 is the lowest and 5 the highest, participants were asked to rank a set of progress markers. These included what the project expects to see/achieve (minimum achievement), what the project

would like to see (progressive achievement) and what the project would love to see (ideal achievement). This exercise was to help determine whether or not there had been any progress with regard to the projects objectives. Participants were asked to use a dot (**.**) to indicate what they had expected when the project began and an asterix (*) to indicate what their expectations are now, considering the project had run for a year.

Farouk Braimah thanked Dr Amoah for his presentation and invited questions or clarifications from the participants. Hans Kwarteng from AMA wanted to know how he could fit into the exercise as he was not part of the previous meeting and could not know how to rate his previous expectation. Dr Amoah responded that, Hans Kwarteng could leave the part on previous expectation and concentrate on the current expectation. He remarked that this would enable the project team to determine the new additions to the group.

Farouk Braimah suggested that given that there were still some questions, it would be useful at a subsequent meetings that the progress markers could be explained further and agreed upon by the participants before any exercise on how to rank them was done.

Dr Amoah wanted clarification from the project leader regarding the expected outcomes and impact of the project. Dr Raschid-Sally opined that it was a difficult question but answered by stating that outputs, such as the models/reports from the project generated information, that served as input to the boundary partners (city authorities and their representatives) to identify strategic directions for adaptation responses to climate change. For eg the Urban Water Balance Model will allow users balance the input/output water requirements and plan the different scenarios of water use to be expected. She also commented that one expected outcome from the project would be to know that those that the models were made for like researchers and the strategic partners (eg Water Resource Commission, AMA planning unit) were actually using the models in the near future. She expressed concern that further thought would have to go into the basis for measuring outcomes, as they were only measurable after projects. According to her, a positive impact of the project would be if by using models and expert information, a more informed decision could be made on future strategic directions.

Mr. Farouk Braimah in turn wanted further insight from participants on how the project was impacting on their various institutions.

Dr. Raymond Kasei of the University of Development Studies (UDS) did not want to preempt his presentation and so did not want to say much.

Dr. Amisigo of CSIR/WRI said the hydrological model which his institution is helping to develop would help in determining the impact of climate change on the availability of water resources. He indicated that his upcoming presentation would clarify the institution's contribution.

Linda Owusu-Asante of NADMO said the platform was helping the organization to sensitize communities along water bodies on the impact of climate change. She said the platform was helping them understand and take appropriate measures to mitigate flooding.

Mr. A. Amarteifio of MoFA at AMA level, said the platform was helping them to understand how to sensitize urban and peri-urban farmers on water use.

Mr. Christian Siawor of Ghana Water Company Limited (GWCL) indicated how the project would assist them in various ways about understanding the water availability and access for providing potable water. Farouk Braimah asked Christian how easy it was to treat water at which Christian answered that discussions and models from the platform when completed would provide the resource to help them plan on how best to source for available water for treatment.

Mr. K. Ohene Sarfoh of the Institute of Local Government Studies (ILGS) asserted that the nature of his institution's mandate was such that they interacted directly with functionaries at the local government levels and so their objective would be to influence the knowledge and attitude of these people. According to him, a recent development has been an accreditation to the Institute to run a master's program in environmental science policy and management targeted at government functionaries and all interested persons. CC was to be an important subject in the course. He envisaged getting in touch with most of the participants when the program starts to afford the students working visits to the practical side of the theories on climate change. Mr. Felix Amakye added that, ILGS tries to engage stakeholders in the development of urban policy and discussions on urban agriculture.

Dr. Carl Osei of the Environmental Health Unit of the Ghana Health Service (GHS) said it was rather unfortunate it was his first time at the platform's meetings as he was representing his boss, Dr Edith Clarke. But he was of the opinion that since the health of people is connected to water; his outfit was very much interested in any outputs and outcomes the platform might come up with.

Ms. Anne Barendregt of AVRL hoped that the outputs of the project in the form of tools or reports could be used by AVRL to further discuss plans on how best to make water available in the coming years, giving the prevailing climate change conditions.

Nii Teiloo Tagoe of Ga Mashie Development Agency/ AMA and who collaborates with the sister project of URAdapt, RIPS, said his outfit was interested in the impact climate change had on urban life. For them, considering their location in Ghana, urban water supply is of great importance because of the population as well as the demands and reliance on water in the

areas. He hoped that outputs and outcomes of the project would provide them with the necessary insights to advice the communities on the effects of climate change.

Mr. Sean Doolan of Netherlands Embassy/DFID works on climate change and development at the national level. He works on national development frameworks and policy requirements to assist developing nations realize the impact of climate change on all aspects of growth of the nation, and mainstream adaptation responses. He works on urban vulnerability to climate change, particularly on how it limits growth.

Mr. B. K. Addo of Greater Accra Metropolitan Assembly said his outfit helps AMA to coordinate their activities and plan towards mainstreaming water issues, particularly in the Tema Metropolitan areas where water resources are dwindling. They also help districts with regards to their water issues and the project could contribute towards this planning activity.

Mr. Hans Kworanteng of AMA Planning Department said his outfit was interested in the provision of potable water and sanitation in the Accra metropolis. He said the models when developed would help remedy the perennial flooding in Accra in the rainy seasons.

Ms. Grace Angela Amoah of MPCU, AMA also asserted that the models would help AMA in advising communities prone to floods. She also suggested that the models should be finished as soon as possible so that solutions can be implemented before the rainy seasons.

Dr. Delali Dovie of Water Resources Commission said his institution was using a couple of the hydrological models to assess the availability of water, especially in the White Volta basins to inform strategy and policy and our work could be integrated into this.
Ms. Bernice Addo of MOFA was representing her boss, Mr Delali Nutukpo. She said the models would provide knowledge which would contribute towards building climate resilient farming communities.

Mr. Busia Dawuni of Ghana Irrigation Development Authority (GIDA) said his outfit deals mostly with farmers and as such was concerned with sensitizing and educating farmers on more efficient water use. This is because farmers previously had the notion that water was always there for use but with climate change, the situation has changed and therefore the need for more sensitization and education. He also hoped that the platform would enable the technical designers to come out with better ways of designing irrigation systems.

Mr. Solomon Tetteh of Great Thinkers Club (Ga Mashie) said their outfit also works with RIPS and GAMADA to engage members of communities in focused group discussions, especially those living in the slums as they are found not to have much knowledge on climate change. The institution therefore creates awareness of climate change. They also look out for climate change

indicators in the local communities and interventions on how best to improve the lives of the people living in such areas.

Farouk expressed his pleasure at the strong presence of the AMA saying it was an indication the project's target groups were also interested in the outcomes of the project. He thanked the participants for their contribution and invited Mr. Sean Doolan to make his presentation.

4. **Climate change and development in Ghana**

Mr. Sean Doolan in his presentation described new developments on the national policy framework for climate change and the wider urban development context. According to him, government of Ghana and other relevant sector ministries and agencies such as the Ministry of Science and Technology, Environmental Protection Agency (EPA) and increasingly Ministry of Food and Agriculture (MoFA) are engaging at the international level on climate issues. The aim is to partly link climate change to the long term growth and development plan of the nation; and assess its implications on the country's infrastructural development and economic assets, as the country reaches a transitional 50-50 balance of urban and rural population. He pointed out that, although there are some discussions at the international level for finance and support, this has not manifested itself in support to institutions or in an awareness to take it forward.

He highlighted the importance of a national approach as against a range of individual internal projects. Mr Doolan asserted that, firstly because the scale of the issues on climate change, the implications are phenomenal. It has now gone from being an environmental issue to being a developmental issue. Ghana's response to this has to be a comprehensive vision and cross-governmental approach with commitment and direction from key, senior leadership; and inter-sectoral coordination and collaboration to scale up integration with national, regional and sector plans. It also requires financing, improved institutions, measurement, reporting and verification. However, this would mean a stretch on the technical capability and capacity that is presently available.

According to him, projections made by the World Bank, indicate that Ghana is confronting changes in temperatures in the near future. Whatever the scenario, by 2030 the northern regions would face a temperature change of 2 degrees C with similar predictions for the southern region at a later time. Climate change impacts are expected to manifest themselves through changes in the extremes with higher and more frequent fluctuations, with all sectors of the economy being affected. He commented on climate and development plans in some asian cities, eg Mumbai's climate change initiatives – a disaster risk management plan was prepared but has never been used. He mentioned that cities contribute to and are affected by climate change especially given the present state of their infrastructure. By his assertion, planners could

use climate change as opportunities to raise profile, reinforce sensible policies and move toward a more sustainable pattern of behavior for climate impact reduction.

A framework approach was discussed which included climate adaptation and disaster risk reduction, lower carbon growth in a carbon-contained world, social development good governance and coordination, research and knowledge management, financing mechanisms international cooperation, communication and measurement and reporting.

On the way forward, it was suggested that there should be well established links between the various agents and agencies that really matter. There should be constant flow of information among the various sectors in addition to seeing how their actions can be coordinated. Again, previous works done should be made accessible as this would prevent repetition of work among the various agencies. In this regard the study by the University of Legon for the African Urban Risk Assessment Network was mentioned. He reiterated the need for reuse of models developed to assess their efficacy so that evidence from projects gathered could draw attention to the effects of climate change at the national level.

Finally, Mr Doolan pointed out that, for a successful national policy framework, each area and sector should see themselves as part of a national solution and Ghana as an international solution.

Dr Raschid-Sally wanted to know if the policy framework document was the same as the one presented at Cancun. She also wanted clarification on whether all the ministries and agencies were tasked with creating awareness of the impact of climate change but for lack of coordination were not doing so. Mr Doolan explained that, though every MDA is dealing with climate change to some degree, the current situation in Ghana is that climate change is seen as an environmental issue to be handled by MEST. Awareness at cabinet level is needed. A high-level council exists but more political ownership is needed. The climate agenda can be moved only with wider engagement by MOFEP. He spoke of the range of committees that are in place but they are fragmented and recommendations if any are not penetrating into planning at NDPC level yet. The MDAs have some awareness but they are not properly directed in what should be done. Also various types of data for decisions are not available – eg there is no national overview of disaster statistics at NADMO. As such there are no strategic directions on how to deal with climate change related disasters. Again, there seem to be no guidelines and systems for the various sectors to act and so it becomes difficult for the coordination needed to tackle climate change issues.

Mr Farouk Braimah thanked Mr Doolan and adjourned the first session for tea break.

5. **Project update**

The second session was chaired by Dr. Delali Dovie of WRC. He invited Dr Amisigo to give update on the baseline for hydrological scenario modeling.

5.1 **Update hydrological scenario modelling**

Dr Amisigo began by emphasizing the main objectives of the model under the URAdapt. These include assessing the impact of the various climate change and other scenarios on water availability (Renewable water) in the Densu Basin; simulating the impact of the various water demand and allocation of scenarios on water use in the Densu Basin (which is the more sensitive of the two basins supplying Accra; and assessing the impact of the various climate change and other scenarios on flooding in the city of Accra.

He further explained that, impact assessments as envisaged under URAdapt would require proper definition of the baseline conditions. For hydrology, this means ascertaining for a stated period the average basin and basin WR vulnerability. For the average basin, it covers rainfall, extreme rainfall recurrence, streamflow, GW recharge, AET, baseflow, water abstraction for various purposes and landuse. For basin WR vulnerability, the indices of WR vulnerability, which are stress and scarcity are used. This is all based on the assumption the there are no variations in soils and geological characteristics.

Dr Amisigo explained the concept of basin water resource vulnerability index. A vulnerability index indicated the probability of water scarcity. Anything between 20-40% would indicate a high probability of scarcity and a value >40% would indicate severe water scarcity. The baseline for Densu surface water resources showed that with a mean rainfall of 1,230 mm, the vulnerability index was 37.7%,. Comparatively, Volta Basin surface water resources which also serve Accra, had a vulnerability index of only 3.5%.

He explained that for the Volta Basin water resources, the impacts on inflows at the Akosombo dam were made based on 3 scenarios over a period of 20 years. The scenarios, which were implemented in WEAP, assumed a growth in water demand from small reservoir (SRs) of 10% per year , and 2 scenarios for rainfall simulating drier and wetter scenarios but without downscaling. Results from the scenario analysis showed that from SRs development, a reduction of about 3% in inflows at Akosombo by the end of the 20-year period could be expected. However, about 110,000 hectares more land were put under irrigation by the end of the period.

Assuming rainfall of 24.2 mm for the drier period and 33.5mm for the wetter period, it estimated that flows at Akosombo would be more drastically affected. Power production at Akosombo at 32 million cubic meters was only possible under the wetter scenario for the reference period. .

He also demonstrated the baseline for flood modeling by indicating the years and the annual maximum rainfall expected. He concluded his presentation by giving a graphic view of the flood risk zones of the study area.

Dr Delali Dovie thanked Dr Amisigo for his presentation and queried how the information presented was expected to be used. Dr Amisigo stated that, the information was for everyone and every sector. Explaining further, he linked it to how MoFA in consultation with GIDA could come out with irrigable areas for food production based on the water availability and the most effective techniques to adopt.

Dr Raschid-Sally was curious about how these consultations were being conducted among the various sectors. Dr Dovie pointed out that there were currently basin boards with the various water sectors, including MoFA and other water user groups represented on these boards. Where a group or individual required any form of assistance, the board would decide on the best model to useon a case by case basis. Sector allocation was done through a strategic assessment of the need.

Mr. B.K. Addo queried why, given that sufficient water appeared to be available, there was inadequate water supply to the population by the water companies. Christian Siawor of GWCL answered this by indicating that the issue was not the availability of water but the availability of infrastructure required for treatment to make the water safe for distribution. He explained that, inadequate infrastructure and the typology of the area also affected communities' chance of getting an adequate water supply.

Dr. Dovie enquired about rural water supply capacity at which point Ms. Charlotte Engmann of CWSA explained that, because rural areas extract low volumes of water, there is no capacity problem. She also added that, the problem of urban water supply was not with availability or capacity, as there was enough water, but the levels of accessibility needed had not been achieved. The issue required a systematic approach which was being done.

Mr. Farouk Braimah enquired about the use of ground water of which Dr. Amisigo pointed out the emphasis of the model is on surface water only.

Mr. Christian Siawor again commented that, developers also cause problems of contamination and flooding by building on water ways and dams. Nii Teiko Tagoe of GAMADA-AMA did not understand why the water companies could not take measures to protect their sites or identify those encroaching and prosecute them.

Mr. Felix Apeti of MoFA suggested the use of recycled waste water for agricultural purposes as an alternative in the short/long term, as it was the largest consumer of water. Dr Raschid-Sally

agreed with this suggestion. She however cautioned that, there should be consultative discussions with experts on the allocation of areas and sites for this purpose.

Dr. Dovie thanked all for their comments and interventions and invited Dr. Raymond Kasei for an update on the climate change model.

5.2 **Climate downscaling with RegCM3-4**

Dr. Kasei began by reiterating the point that climate change was really affecting water availability and supply. He explained that although there seemed to be more water, high temperatures caused by climate change may cause this excess water to evaporate. There was a re-cap of the climate downscaling model regarding its objectives, activities, problems and findings so far.

The objectives had been to nest fine-grid Accra area's atmospheric model within the GCM's coarse-grid global model, to use the current generation physics and numerics to simplify the task of climatic input data for modelers and generate outputs flexible across the platforms.

The order of activities had been to setup a Linux platform to gather all relief information on historical climate data and orography of Accra and Akosombo areas; set dynamics and physics based on land surface model, sea surface temperature and atmospheric land interaction; pre-process with boundary conditions as data for initial and lateral boundary conditions and finally simulate with the A1B and B1 scenarios based on IPCC projections.

The initial grid was the Densu-Accra area. It was however agreed on, after further consultation to extend the work to include the Akosombo grids as well since part of Accra's water supply is sourced downstream of Akosombo at Kpong. . As such, the current simulation area has been widened to 55km, which includes the Akosombo area. These areas has now become of interest for the URAdapt.

The initial primary data showed sparse distribution. This had to be worked on to the point sources of the regional downscaled data taking into account a range of climatic parameters-rainfall, temperature, relative humidity, radiation and wind speed. Some points in the Densu basin have been earmarked as validation points before the use of the downscaling model.

According to Dr Kasei, a major problem encountered by the team was the lack of data from the meteorological service. Available data on rainfall averages between a thirty year period of 1961-1990 and three model ensemble runs of IPCC climate scenarios A2, A1B and B1 for present (1961-2000) and future (2001-2050), indicated consistency of the IPCC with other models.

Based on this, analysis on statistical downscaling for the URAdapt areas was now underway. Tentative initial findings on the trends suggested a decrease in annual rainfall. Using the Standard Precipitation Index (SPI), which is a well-known way of measuring precipitation as a baseline, a comparison of climate occurrences was made for the past four decades with a four decade period in the future for the URAdapt region, using RegCM A1B-simulation.

The results showed no difference in the number of occurrence of severely-extremely wet and moderately wet events for the past and future. However, there were significant differences in the occurrence of a normal year, a moderate dry, a severely dry and a severely-extremely dry year. The occurrences in some cases had more than doubled.

Dr Kasei reiterated the point that, with climate change the future is not all bright as more droughts are expected.

He concluded his presentation with the expected deliverables. On this, the team is expected to identify and document secondary data, including meteorological datasets in each of the catchment of Accra and Akosombo. They are to provide a regional synthesized paper detailing a list of datasets, data availability and procurement details, a 55km gridded meteorological dataset simulated for the period of 1961-2000 (which was ready) as well as a meteorological dataset simulated using IPCC-A1B & B1 scenarios for the period 2001-2050. The meteorological parameters should include, Rainfall (mm), Temperature at 2m (°C), Windspeed (m/s), Radiation (W/m2), Relative humidity (%). Finally, a finer gridded meteorological dataset simulated using IPCC- A1B & B1 scenarios for a period of 2001-2050.

Dr. Dovie thanked Dr. Kasei for his presentation and wanted clarification on the model's assertion on more impending droughts. Dr. Kasei answered by referring to the fact that there is evidence of increase in intensities of occurrences and a shift in their onsets. This is such that rainy seasons are getting mono-modal (instead of the bi-modal distribution), where the north and south all have similar rainfall patterns.

Mr. Daniel Berefor of EPA/SPO queried the assumptions, scale and application of the IPCC models and how it is applicable in a local setting. Dr. Kasei answered this by referring to the idea of regional downscaling, where prevailing conditions in the region or area are compared to determine the probable outcome.

Mr. Sean Doolan asked whether the dataset available can be said to be robust. He also suggested that since other models are being used by the World Bank in association with other international organizations (Ghana Meteorological Agency and the Hadley Centre) about regional downscaling and early warning system especially on storage, as it would be good to get in contact to share information. This is important as there have been some variations

particularly on rainfall based on some of the models. Dr. Kasei replied that their results were similar to what other models were reporting. On the issue of the dataset being robust, he could not say with total conviction but was certain it is better.

Ms. Amoah Grace Angela of MPCU, AMA asked how validation of the scenarios was possible since the data from the meteorological department might be inaccurate. Dr. Kasei explained that this is possible as validation was done with neighboring stations to serve as checks and balance on the datasets.

Mr. Farouk Braimah wanted to know at what point the World Bank's study started; if it was before the development of the project models or after as there was the tendency to rely on the world bank report as against our own one.

Mr. Daniel Berefor also wanted to know if consideration has been given to the Tropical Rainfall Measuring Mission (TRMM) project to which Dr. Kasei replied that the TRMM project had some difficulties with constant updates and fine tuning of the model as extreme values, which are critical to this kind of study, are left out.

Nii Teiko Tagoe made reference to the unreliability of data from the Meteorological Department and suggested the engagement of schools and teachers in collecting meteorological data, in a bid to ensure a robust model. Dr. Kasei agreed with him but was quick to add that more than 70% of data from the Meteorological Department was accurate; the problem was with collection in small rainfall stations where it was difficult to recheck the entries.

Mr. Ohene Sarfo asserted that, some of the outputs from the model should be fed into sectoral policies so that there would be more opportunities to address these problems in the society.

The discussions came to an end with Dr. Dovie thanking all for their comments and contributions. Dr. Raschid-Sally was called upon to give her final comments.

5.3 Wrap-up

Dr. Raschid-Sally was pleased at the outcome of the discussions. She highlighted the usefulness of the outcome mapping exercise and urged the participants to look critically at the mission and vision, and what progress markers are best suited for the platform discussion in the next meeting.

She pointed out the importance of the climate change model framework as both models were seen to be progressing based on the presentations given. She was happy about the simplified ways the models were explained for better understanding.

Overall, Dr Raschid-Sally wanted participants to reflect on how best to use resources to contribute to the platform. She commented on how it would be interesting to see a synthesized policy brief on the Densu and Akosombo water situation.

She said that some level of institutional study was needed even if it was a synthesized form, to understand the mandates of institutions to address climate change, or the projects they are undertaking, and the levels of sectoral/institutional coordination needed to address the issue of conflicting inter-sectoral climate change agenda. This could be done in the form of technical studies or a workshop, to bring together the technical people to share ideas on the models.

Finally, as the group moves towards designing interventions and formulating the strategic agenda for climate resilient Accra, she stressed the need to identify and fill gaps in the platform, so as to feed results from the platform into policy processes.

Dr. Raschid-Sally thanked all participants for their time and contributions, and assured them of an update of the project on the project's website. A closing prayer was then said by Solomon Tetteh to bring the meeting to a successful end.

ANNEX I - MEETING AGENDA

URAdapt

3rd Meeting of the Research into Strategic Action Platform (Re-SAP)

18 January, 2011
Coconut Grove Regency Hotel, Accra
8:30 a.m. – 13:00 p.m.

Welcome	09:00 a.m. – 09:15 a.m.	**Welcome remarks and overview of progress** *Liqa Raschid-Sally*
Project monitoring and evaluation *Chair:* *Farouk Braimah* *People's Dialogue*	09:15 a.m. – 09:45 a.m.	**Outcome Mapping** *Philip Amoah* *URAdapt*
	09:45 a.m. – 10:30 a.m.	**Exercise** *All*
Tea & Coffee	10:30 a.m. – 10:45 a.m.	
Project update - *Chair:* *Dalali Dovie* *Water Resources Commission*	10:45 a.m. – 11:15a.m.	**Hydrological modelling** *Barnabas Amisigo* *URAdapt*
	11:15 a.m. – 11:45a.m.	**Discussion**
	11:45a.m. – 12:15 p.m.	**Climate change modelling update** *Raymond Kasei* *URAdapt*
	12:15 p.m. – 12:45 p.m.	**Discussion**
Closure	12:45 p.m. – 13:00 p.m.	**Wrapping Up** *Liqa Raschid-Sally*
Lunch	13:00 p.m.	

ANNEX II- LIST OF PARTICIPANTS

No	NAME	ORGANISATION
1	Barnabas Amisigo	CSIR - WRI
2	Charlotte Engmann	Community Water & Sanitation Agency
3	K. Ohene Sarfoh	ILGS
4	Raymond Kasei	University of Development Studies (Tamale)
5	Delali Dovie	Water Resources Commission
7	Amoah Grace Angela	MPCU, AMA
8	B.K. Addo	GAMA RCC (Regional Economic Planning Officer)
9	Frederick Logah	CSIR - WRI
10	Naambuyi Dokurugu	National Disaster Management Organization (CDCO)
11	Farouk Braimah	People's Dialogue
12	Bernice Addo	MOFA
13	Anne Barendregt	AVRL
14	Busia Dawuni	Ghana Irrigation Development Authority
15	Solomon Tetteh	Great Thinkers Club
16	Philip Amoah	IWMI
17	Kwabena Gyasi-Doku	Water Directorate
18	Sean Doolan	Netherlands Embassy/DFID
19	Felix Amakye	ILGS
20	A. Amarteifio	Ministry of Food and Agriculture
21	G. Nii Teiloo Tagoe	Ga Mashie Development Agency/ AMA
22	Baba Y. Mahamah	TCPD
23	Carl Osei	Ghana Health Service
24	Christian Siawor	Ghana Water Company Limited
25	Felix Apeti	Ministry of Food & Agriculture
26	Daniel Tutu Berefo	EPA/SPO
27	Linda Owusu-Asante	NADMO
28	Isaac Mensah	National Disaster Management Organisation/ AMA
29	Diana Owusu	International Water Management Institute
30	Edmund K. Akoto-Danso	International Water Management Institute
31	Liqa Raschid-Sally	International Water Management Institute