URAdapt

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

REPORT

URAdapt Addis Ababa Second Re-SAP Meeting.

Thursday, August 5th, 2010

Report on

URAdapt Addis Ababa Platform Workshop

Thursday, August 5, 2010

ILRI-Small Auditorium, Addis Ababa, Ethiopia

1. Background

The platform workshop meeting was organized on 5th of August, 2010 at ILRI Campus in Addis Ababa. This is the second Re-SAP workshop. Two major activities have been accomplished before the workshop. The first included identifying the research agenda, prioritizing the research in terms of their time of execution, and conducting preparatory research work for baseline survey. The second major activity includes preparatory work for organising the workshop which includes arrangement of workshop venue, sending invitation letters to the workshop participants, preparation of the workshop program, etc. The list of the participants and the programme are attached at the end of these proceedings. A detailed discussion was also held among the team members on the research agenda prior to the workshop. In addition, the visiting team members, made a field trip to the wastewater farming area within Addis and downstream, and also met with different institutions. The facilitation of the activities by the a Addis team was highly appreciated. For this workshop the visiting team members were Dr Liqa Raschid-Sally, Ms Maija Hirvonen, Mr Daan Van Rooijen, and Dr Chris Scott.

2. Objectives of the workshop

The main objectives of the second Re-SAP workshop were to

- update the stakeholders on the progress of the project since the inception workshop
- get feedback from the stakeholders on the research agenda identified by the project team
- provide opportunities to the stakeholders to discuss on research topics highly relevant to their own sectors, comment on the research agenda and suggest additional research studies other than those identified by the project team through group discussions.

3. Opening session

The opening session was chaired by Dr Yilma, Head of Civil Engineering Department of the Addis Ababa University. He welcomed the members of the platform and invited Dr Liqa, project team leader to welcome the gathering. After she introduced the team members of the URAdapt project, she briefly described the structure of the workshop program, in which she emphasized the importance of knowing the perception of the members of the platform on the vulnerability of the sector from which they come through the group discussion. She said that this is because the success of the project relies on the knowledge and perceptions of the stakeholders, who are better equipped to identify the real research priorities. Following Dr Liqa's speech, Dr Yilma invited the guest of honor, Ato Haile Fisseha, Deputy Manager of Addis Ababa City. Ato Haile was pleased to open the second URAdapt workshop meeting. He mentioned the importance of climate change (CC) and pointed out that the world is observing the impacts of climate change on cities. We are witnessing the impacts of changing temperature and precipitation pattern on our city. He also mentioned that CC represents a challenge to the quantity and quality of available water and that Addis Ababa city, in particular, and Ethiopia, in general, should respond to the impacts due to climate change. He mentioned that Addis is currently considering groundwater as a source of water supply to the city. The responses should be immediate as this is an issue requiring urgent action. He pointed out that URAdapt project and platform is among those which will contribute to responding to the impacts of climate change. Therefore, he encouraged all workshop participants to contribute to the success of the project by actively participating and raising important points during the workshop. He closed his opening speech by officially declaring the workshop open.

Dr Yilma thanked Ato Hailu Fisseha for his opening speech and invited Dr Liqa to the floor to make her presentation.

4. Presentation and discussion

The first presentation was made by Dr Liqa. The title of her presentation was "Managing Water at the Urban-Rural Interface: The key to climate change resilient cities". The contents of her presentations were a brief recap of the project; contrasts between Addis Ababa and Accra; and project evolution. In her recap, she started by reminding the group about the three

central questions that need to be addressed. The first central question was "what consequences will climate change have on water resources availability?" The second central question was "what influences urban growth and how do urban growth scenarios affect water needs and wastewater generations?" The third question was "what consequences will climate change have for wastewater disposal and management?" In addressing these three questions, she explained the three objectives and associated outputs of the project. One of the objectives is to develop shared understanding of climate change and urban water amongst multiple stakeholders, which will have as output an Interactive platform to move from Research to Strategic Action [or promoting a culture of adaptation planning for CC and water resources]. The second objective was to generate new knowledge using scenarios that will have final outputs of "Hydrological scenarios of water availability, wastewater generation, and implications for agriculture" and "Decision support for investment in integrated urban development". The third objective explained by Dr Liqa was to develop a city level strategic action plan for adapting to climate change that will finally have an output of policy and institutional orientations on how to build climate resilient cities.

Dr Liqa also compared and contrasted the two project cities, Addis Ababa and Accra. In her presentation, she emphasised on the hydrological modelling framework for Addis in relation to climate change impacts. With the help of a map, she showed Addis is situated relatively upstream of the basin, but Accra is downstream of the Odaw basin. In Accra, most dense development is in the Odaw Basin and water then drains into sea. Therefore, she proposed that, in Accra, upstream issues would be the main focus whereas in Addis, downstream issues are very critical as well. She also presented institutional contrasts between the two cities. Addis has more autonomy, which has implications for adaptation responses. But in Accra, decision making is more dependent on central government, which can bring in a certain level of coordination, with less likelihood of overlapping responses to adaptation. However the local level has less authority for independent decision making unlike Addis. In Accra, there is also more targeted policy engagement. In Addis, she said that the Platform can decide to do similar activities.

Dr Liqa then talked about the Project metamorphosis in which she raised important points on the research-strategic action (Re-SAP) platform. In Accra, a small group called the Consultative Group plays the essential role in conceptualizing the thinking around 'big' questions of relevance to the project, whereas in Addis, a Core group of the most strategic

partners has been set up with greater involvement in the research studies and data search. In Accra, in addition to the Consultative group, the team has already moved to identifying "policy communities" that has resulted in targeted policy engagement to develop timely recommendations that meet the needs of city-, regional-, and national-level authorities. In Addis, this has not yet happened. Finally, Dr Liqa informed http://uradapt.iwmi.org as the web page of the project and advised all participants to look at it to get up-to-date information about the project. The presentation of Dr Liqa is available on the website.

The second presentation was made by Ato Geremew on the progress of the project since the inception workshop on April 12, 2010. His presentation was divided into two parts. The focus of the first part was mainly on 'Preparatory work for upcoming baseline survey' whilst the second part was on "Project research activities". In part one, he presented the objective and conceptual framework of the baseline survey, as well as the checklists developed for the baseline survey. He also explained in detail the focus of the survey and the type of information needed. He mentioned that 8 M.Sc. students will participate in the baseline survey. In the second part he presented the different project research ideas, which are categorized in to six research themes. He also explained that each research theme has been classified into sub research topics. Responsible persons for each of the research themes are also identified. Next, Ato Geremew presented the different research activities that are already completed, on-going and planned to be conducted in the coming project period. The title and objectives of each of the research topics were also presented. Finally, he presented four leading questions for group discussions. The four leading questions were:

1. Which Research Topics are highly relevant to your Sector?
2. Any additional research theme/topic that should be included
3. How would you incorporate research outputs in your sector/institution?
4. Is there any currently ongoing/completed/planned research having similar topics.

The list of research questions proposed is in Annex 1

Discussion around the two presentations

Following the two presentations, the chairman opened the floor for questions, suggestions and comments from the workshop participants.

The first point was raised by Dr Semu, who suggested that all topics identified have to be narrowed down to make activities feasible. They need to be action-oriented, participatory research since the intention is to prioritise research agenda.

The second point was raised by the Deputy Manager of Addis. He said that the research topics are aligned with the research project in Addis led by AWSA, which is on assessment of the impact of CC on groundwater potential. He stressed that currently it is important for city authorities to know the groundwater resource potential in different parts of the city as well as the CC impact on the ground water resource. This is because the city administration is trying to expand the city's water supply to all of its inhabitants. For instance they have already begun to drill wells. However, there is still debate whether to drill boreholes or to build dams. Therefore, they were looking for justification in terms of which strategy to adopt. Interesting discussions took place on his points by the participants. Dr Liqa asked whether or not the groundwater potential of the city has been mapped and what were the potential impacts cc might have on groundwater? He immediately responded that Yes, it has already been mapped. Dr Semu intervened and pointed out that the water balance/ groundwater recharge of Addis can be addressed but it was necessary to liaise with other experts for assessment of deeper groundwater potential or that if a concept note is prepared, it is possible to seek collaboration with other AAU researchers for this aspect. Dr Liqa stressed that though the importance of making the link has been recognised, it is not certain whether or not currently there is enough data to confirm. She also said that the project may not be able to clearly identify the relation between cc impact on groundwater potential but it can certainly come up with certain topical research studies that are needed.

Ato Wandimu, Deputy Head of the AAWSA, said that the conjunctive use has already started but currently they focussed on the groundwater potential due to shortage of time and cost. They need also to investigate the salinity of the groundwater resources, which is not still known. He further suggested that if the project can do comparison of the groundwater potential with other water sources, and how this differs under climate change, this would be useful. He stressed that the issue of groundwater use is an urgent one for the city. Dr Yilma intervened and said that the conjunctive use of ground and surface water has already been looked into by the Ministry of Water Resources. The preliminary result from the ministry shows that the groundwater recharge area for Addis is outside of the city, especially for deep wells, and ranges within 6000 sq km area. The result also indicated that the Groundwater

potential of Addis is good. Dr Scott also intervened and provided insights on Ato Wondumu's point based on his experiences, that one has to consider that for groundwater, investment cost may be low but operational cost is high. He raised investment costs related to long storage time, dams (short storage time), treatment (salinity treatment), etc, and operational costs, for example, related to electricity supply for treatment, cost for pumping and discharge. He mentioned the need to conduct detailed technical studies, during the project planning stage for groundwater. He also mentioned the need to consider the opportunities for conjunctive (ground and surface water use), etc at project planning stage and to think about using groundwater as a buffer capacity and not the main source to avoid other environmental problems.

Another point was raised by Ato Tamiru from the Ministry of Water Resource. His point was related to the need to give priority for research related to IWRM since the water resources of Addis are outside of the boundaries of the city. He said that the institutional aspect of implementing the IWRM policy and strategies should also be given due attention in the project research topics. Dr Semu and Dr Liqa intervened and said that the point raised on institutional aspects of IWRM is important, and further elaborated the need for investigating the degrees of integration that would be needed for issues to be taken on board; the links to good institutional mapping (national; regional) as well as the need to investigate "What are the water-related linkages? What are the degrees of integration?"

Ato Abiti from the research directorate of the Ministry of Water Resources pointed out that three research topics have already been identified by the ministry together with AWWSA. The ministry has already secured money for one research topic on "Water quality from source to end-users – information needs for the city", which was available as a grant for researchers and was currently looking for money for the two others on "non revenue water losses" and "reuse of water". The ministry is also ready to share its laboratory facilities. Ato Wandimu intervened here and said that the research on the non-revenue water (water loss) is a completed activity; but the study on the reuse of water is among the topics that is still not done.

Another member of the platform from a NGO emphasized that research on policy, institutions and governance has to come first as it is the foundation for the others. He said that unless one sees the institutional and policy gaps in wastewater management, it is hardly possible to see

the governance structure needed to implement the findings of Climate-related adaptation measures. That is, it is difficult to design activities without identifying which institutions are necessary to look at water quality, wastewater management and which policies are missing. He also commented that additional research on the Food security and agriculture is also needed since URAdapt is not just about Addis, but also its surroundings, and the surrounding areas are farming areas. So it is advisable to understand the land management, agricultural activities, food security/ insecurity, so that one can understand the impacts on the water system in city. Dr Alebel acknowledged the importance of the comments and suggestions given by the participant since Addis is linked to Oromiya region for its water resource requirements as well as its impact on the downstream uses. Dr Liqa also stated that the project has taken this into consideration particularly with respect to the points on the downstream water quality/ quantity (availability). But she said that though the suggestion from the agricultural-livelihood angle is good, it might be beyond the scope of project in terms of resources. But, she said, it does have impact on urban water demand (migration).

Finally Ato Geremew and Dr Semu said that the project team will formulate concept notes around each subject and circulate to the platform members.

The session broke up for coffee.

Session 2

This session was chaired by Dr Chris Scott. The session began with Dr Semu's presentation. titled "Downscaling Climate Change to Addis area, to assess climate change impacts on availability and extreme hydrological condition". He started with background information on the important effect of rainfall variability on the economy of Ethiopia where he showed the strong link between the change in GDP of the country with rainfall variability for the years between 1992 and 2000 using graphs. He then explained the result on the projected climate change impact on rainfall and temperature variability for window of 2031-2040, 2091-2100. He did the analysis using RegCM3 modelling system. The result in terms of changes in rainfall and temperature indicated that it is highly likely that there will be increase in rainfall during the rainy season (July-August-September) consistently in 2030s and even in 2090's; there will be a significant reduction of rainfall during April-May-June; significant increase of rainfall during Oct-Nov-Dec and in terms of annual volume, there will be annual increase in

total rainfall. The result for change in temperature also indicated that there will be a consistent increase in mean temperature consistent with the prediction given by IPCC by 0.37 degrees Celsius/decade but relatively not much change in terms of seasons. He also explained the implications of the change in rainfall and temperature. The implication of the change in rainfall is the likely increase of flooding and community vulnerability to flood damage, which likely changes the way we design our drainage structures. The implication of the change in temperature due to change in climate may include a movement of malaria to highland areas like Addis Ababa; more water consumption; more energy consumption and change in biota of the study area. Dr Semu also presented the result on "Impact assessment of water availability" which he did using a hydrological model. He explained the results from the simulation analysis he did with his Msc student (Abayneh Alemu) for Akaki catchment areas for the period 1997 to 2004. He finished his presentation by presenting the limitation of his study and acknowledging individuals especially from IWMI-Ethiopia office who assisted him in the analysis. The presentation is available on the URAdapt website .

Questions and discussions

A question is raised by Ato Abiti from Ministry of Water Resources on the period of the data. Dr Semu used data for the years 1997 to 2004. He responded that it is possible to add data for more years but he used these years since he wanted to compare his results from other similar international studies such as the IPCC studies.

Ato Wondimu from AAWSSA commented that the results are in line with our common understanding for the city when we plan for water supply to the city specially the result on rainfall change.

Another participant, after acknowledging the relevance of the study as providing a lot of information, raised a question on how the researcher selected the model he used for the analysis. Dr Semu responded that there are many models (may be 15 or so; Dr Scott intervened and said 23 models are currently used in the world) but there is agreement in the results from some of the models and he used a model that can capture the Ethiopia situation and increase the reliability of the result. However, he said, the result is not a final output. It is a preliminary output. Dr Scott also added supporting ideas to Dr Semu's response and said that since results are not annual changes, Regional model selection is important. He also said

that it is good that the results are presented in annual and seasonal changes and that it is important to capture the onset. It appears that the dry season will have a high temperature increase, and a decrease in precipitation and that April season will be critical. The result has important implications in that focus has been on flooding during wet season, and droughts during dry season.

Another question was raised on how the research incorporated the impact of global climate change in to the local condition since the latter is affected by the former. Dr Semu responded that it is not incorporated in the analysis but used some assumptions. Dr Scott added that the IPCC used two extreme scenarios in climate modelling: high carbon use generated economic development per unit of GDP growth and carbon-friendly or green growth kind of development.

The results related to rainfall change due to climate change were queried. Dr Semu responded that there will be a shift in wet season towards later in the 21st century. In relation to this, a question was raised whether the research investigated the cause for change in rainfall. This will be investigated in the next research agenda. The implication of the change in rainfall for water availability will also be investigated as more rainfall doesn't necessarily mean that there will be more water for domestic uses. Dr Scott added that one should not be totally dependent on the result from hydrological model for operative planning purpose or for water supply plan for the city. The issue of reduced base flows was also highlighted, and its implications for reservoir operation were mentioned. Seasonal climate variability modelling using seasonal forecasting models (3 months advance predictions) are still necessary since regional models though they will provide the rainfall values for a specific month, cannot be used for reservoir operation as this requires seasonal predictions.

Urban growth and increase in impervious surfaces must be factored in as impacts like more flooding can occur due to more runoff even with the same rainfall.

A question was also raised on the possibility of further downscaling the resolution 50 x 50 used by the study. Dr Semu responded that the team's attempt is to go to 10 kms by 10 kms. Dr Semu also agreed on the comment that his research had used a different baseline to the IPCC baseline (1961-1990), and this might influence the outcome, so he agreed to change these to allow for comparison.

After questions on Dr Semu's presentation, Dr Scott provided an opportunity to the participants to discuss on issues raised before coffee break. One of the issues was on social impacts of climate change. The questions were on whether or not the project will address issues on social impact due to climate change or how farmers will respond to the change. Ato Geremew said that this is too broad to address in the project. But Dr Liqa suggested that the social impact study is still to be defined in the project, but it will look at the climate change impact on vulnerable groups of society. Potentially these could be groups within the city (categorised as high, medium or low risk), downstream of the city or even the city structures and functions as a whole. Dr Scott added that there is a M.Sc. student (Tabitha Spence) from Arizona University doing her M.Sc. thesis on social aspects of vegetable growers downstream of Akaki river. Her study focuses on the issue that as the city is growing, water quality is changing and thus the need to understand how farmers are adapting to the change in water quality.

Multiple uses of reservoirs serving water supply to the city was also raised and the need to study the effect of land-use changes, cattle rearing and farming practices on the reservoir. For instance this could lead to siltation, reducing water storage capacity, thus aggravating climate consequences. Industrialisation in the catchments of the reservoir and impacts on both surface and ground water quality were mentioned, though these may not be directly addressed by the project.

Another general issue that arose before coffee break was on carbon trading and emission, and liquid waste management, and the Clean Development Mechanism (CDM) certification. The deputy city manager said that Kaliti wastewater treatment plant has already been registered but had no capacity to qualify for certification. Waste management projects on mitigation were being designed. Dr Liqa said that the project focuses on adaptation, not mitigation. A participant said that National Adaptation and Mitigation Programme is being coordinated by EPA, and a Climate change framework for action has been developed and is with the EPA. Addis city can input into this. EPA in Ethiopia is focussing on forestry sector trading for mitigation. On CDM, a participant said that an AAU-UNDP project was addressing this and there was no need to replicate as there are special requirements. Questions were asked on what EPA's role in carbon trading was, what the related projects in the pipeline are? It was understood that in terms of adaptation measures, priority was given to the problems of

pastoralists. It was re-iterated that climate impact on urban areas is neglected, given the size of population that might be affected.

After Lunch

Session 3

Session three was after lunch and it was about inculcating a culture of adaptation management by searching for possible adaptation responses to the issues recognised as impacts. Three presentations were made. The first was by Daniel Van Rooijen on "Urban water balance modelling in VENSIM and findings from his PhD research". The objectives of his presentation were **t**o generate needed knowledge and deeper understanding of an urban water system and its vulnerability; and to process demographic and water supply and demand scenarios in order to rationalize the discussion on climate change risks, and provide decision support. His presentation set the baseline and identified potential vulnerabilities of the urban water system that climate change might exacerbate. His water balance indicated that water supply presently to Addis was from three dams (two of which provide continuous supply), as well as the Akaki well system providing groundwater. His study, which used the VENSIM model, treated the city as a single unit i.e. no distinction is made at the city level. Outputs for the project would be an urban water database, scenarios (urban development & CC), an assessment of their potential impact and an urban water model as a decision support tool. The preliminary outputs for city-level include wastewater generation & storm water runoff for Addis. His PhD findings are related to the city level, and identify urban water stress (low per capita use and supply driven water provision) and the constraints the city authorities have in their daily and structural operations (including financial and institutional capacities constraints) as key problems. As possible solutions emanating from upstream of the city, his presentation pointed out the possibility of water supply source expansion through inter-basin transfer from Abay Basin or though the use of groundwater. He also highlighted the problems related to siltation of reservoirs that were recognized by AWSA and the related threat to water availability. He also raised catchment development for agricultural and domestic water demands as an upstream issue impacting on the system. In relation to the downstream uses and impacts of Addis city, his PhD findings identified the re-use of

wastewater in irrigated agriculture for vegetables production, pollution of Great and Little Akaki River with industrial effluent and domestic wastewater and the related health concerns for humans and environment as important issues. These needed to be assessed in the light of climate change. His presentation also indicated that to refine the model, more data was needed on informal water use from groundwater, urban expansion, land use maps for Addis and Oromia (built-up vs. green and water), historical development of sanitation facilities and plans for urban water supply expansion. Daniel ended his presentation by presenting the completed, on-going and planned activities for WP2 of project activities. The presentation is available on the website.

The next presentation was made by Mengistu, on his preliminary findings from his M.Sc. thesis. The focus was on leakage management as an adaptation response given that the infrastructure leakage index was 7.9. A breakdown of the loss component indicated that commercial losses accounted for 27% but the balance was from physical losses within the system due to weak infrastructure. The costing of water could be equated to the cost of detecting the leaks as this was an expensive process. He presented some cost figures but without commenting on whether these are acceptable to the users. The presentation is available on the website.

The third presentation for the afternoon was made by Dr Chris Scott. His presentation was on "Water Reuse, Growth and Climate-Resilient Cities". He started by emphasizing that the water sector is the sector most affected by climate change, and therefore the perception of city authorities about cc is influenced by this. He also insisted on the common reaction of urban authorities who often say that **"**Climate change is a long-term process – why do we have to be concerned today?", "We have more pressing concerns, like supplying water and sanitation services" and "Climate change means international carbon agreements so best left to federal authorities". However, he said that though these are valid concerns, the following points are worth consideration. Climate change is long-term, ***but*** variability (flood, drought, heat-waves) are already occurring; providing services today is a challenge, ***but*** these will be most affected by climate: water is a lens that focuses climate change; and Climate (carbon) mitigation depends on international agreements, ***but*** adaptation is a local priority where water reuse in general, and in particular for urban agriculture in the absence of other sources, are important strategies. Following on this, he presented explanations for the question on "why adaptation is needed? And What is it?". He then explained how city authorities build

resilience in cities through facilitating key water and water reuse strategies. In building resilient cities, he said, strategies should consider public perceptions; understand managers' priorities; and enhance local and regional planning. He presented detailed explanation on these three concepts. He then explained the synergies between water reuse and growth in which he indicated that reclaimed water can be viewed as a source of new supply. Habitat and riparian area uses of reclaimed water are likely to be affected when this water is used for other purposes; public perception is increasingly amenable to indirect potable reuse with safeguards and; patterns and rates of growth are unlikely to be significantly affected by public perception, and minimally so by regulatory controls on water reuse. He finally explained what a resilient city is. His presentation is available on the website.

The session ended with a brief question and discussion on the three presentations due to short time remaining for the group discussion. Daniel was questioned about the general nature of his presentation and asked whether his findings were general or whether more details were available. Daniel responded affirmatively, but the lack of time had curtailed his presentation.

Session 4: Group discussion

The fourth session was reserved for group discussions. The objectives were to stimulate thinking, provoke discussions and bring up urban problems on to the agenda. It was also intended to understand the perception of decision makers about the vulnerability of the sector. Accordingly, two main discussion points were given to the participants divide into 2 groups namely:

1. "How do you see climate change potentially affecting water related activities relevant to your sector?" and
2. "List information needs that you might expect from this project for improving decision-making related to your work?".

Each group presented the results in plenary, which were discussed. Some interesting perceptions of stakeholders from the different organisations of importance to the project are captured below.

Group one presentation

Discussion results on question 1: how do you see climate change potentially affecting water related activities relevant to your sector?

- meteorological agency: makes meteorological forecasting difficult or unreliable.
- Ministry of Water Resources: impacts include frequent fluctuation of hydrological data which makes forecasting difficult; shortage of water for irrigation and hydropower supply; damage to hydrological structures due to flood and increase monitoring frequency of dam level;
- AWSSA activities: impacts include low water storage in the dam due to low rainfall which affects water supply; flooding and impacts on waste management system.
- EPA: is that in addition to the above effects, it makes difficult to enforce the environmental standards.

Discussion results on question 2: List information needs that you might expect from this project for improving decision-making related to your work?

- EPA needs information on forecasting of climate change with possible mitigation and adaptation plan for cities
- Necessary information to update policy makers (Advocacy)
- Incorporating appropriate policy and institutional set up
- Ministry of Water Resources needs information for managing and monitoring dams; flood forecasting system model; structural and non-structural flood protection system model; capacity building; alternative options for other water resources while shortage of water and kind of climate data the project requires.

Group one presentation ended with a remark not related to the group work, on insufficient information sharing with the platform after the first inception workshop.

The discussion that followed raised the following questions. Dr Liqa asked whether the group had focussed on upstream issues during their discussion. The group responded that they focussed on the sector as a whole and did not specifically consider upstream or downstream. The second question not related to the group work, was on frequency of the

platform meeting, which meets every four months with an info gap in between. Dr Liqa responded that this will be improved since the project website is already launched. Prof Chris commented that some information in the form of bullet point can be shared to the platform; the team should also provide a summary of (2 to 3 pages) to the platform through email or in the web site of the project.

Group two Presentation

Discussion result on question 1: how do you see climate change potentially affecting water related activities relevant to your sector?

- Change in rainfall pattern, which changes reservoir inflow, which in turn reduce water availability.
- Rise in temperature can increase evaporation --- and also reduce water availability
- More extreme rainfall means more erosion, which increases siltation, which in turn, reduces reservoir capacity
- High temperature increases water consumption and health risks such as malaria
- Less groundwater recharge which reduces ground water level, which, in turn, has an impact on cost effective technology such as hand dug wells, springs and shallow wells. These finally affect the livelihood of the people.

Discussion result on question 2: "List information needs that you might expect from this project for improving decision-making related to your work?" :

- Decision making model
- Management aspects such as legislation of IWRM approaches and options for enhanced involvement all stakeholders
- The project must bring alternatives with its advantages and disadvantages so decision makers can select based on specific criteria. These include alternatives for conserving water use in urban areas which may include options like rainwater harvesting or reuse of wastewater.

The only question to the group was a request for an explanation on what was meant by "advantage and disadvantage of alternatives". The group representative responded that the

project should be able to identify, for instance, the advantages and disadvantages of different alternatives eg use of wastewater vs use of groundwater.

Wrap Up and Closing Remarks

Finally Dr Liqa made the closing remarks in which she presented a wrap-up of the discussions made by the workshop participants for the whole day. She started by stressing the importance of prioritizing the research questions of the project. She indicated that the research questions should be meaningful to the project, so that resources are not spread too thinly. She also said that some studies may just be planning assessments where complete studies were not possible due to lack of data. Eg the Groundwater issue may not be studied in depth but only with the purpose of understanding the potential for using the source. There is also a need to prepare concept notes for some of the research topics of the project and share with the platform. She also mentioned that this one day workshop discussion brought out various potential studies to link cities to climate change impacts. Even if not done, they will help define the types of studies required for an integrated urban-rural analysis. Issues were also raised on other uses of water sources e.g farming around Legadadi, under climate scenarios that may take place, that should be factored into the project study. The need to understand the social impacts of climate change within the project framework has also been raised. In this respect, farmers emerged as one target group who are vulnerable. She also queried if there are any other vulnerable groups to be considered. A hydro-climatic institutional mapping and assessment is also necessary to understand the links, and power structures influencing city responses to climate change adaptation. She also pointed out that the analysis of scenarios should not overlook the seasonality and variation aspects of climate impacts. For example, the long-term projection is sufficient water available, but base flows at certain times of the year might be inadequate thereby limiting certain uses. She finally thanked the stakeholder platform for the very good role it had played as a focusing device to validate preliminary findings of the diagnostic studies. She ended the wrap-up by reminding the platform of their commitments to the project and thanking them in particular for the offer of using the laboratory of the Ministry of Water resources, and for contributing to the research concept notes that the team will circulate in the near future.

URAdapt platform workshop

5 August 2010, ILRI Campus, Addis Abeba

List of Participants : Re-SAP 2 Addis

S/No.	Name	Title	Institution
1	Abayneh Alemu	MSc. Student	Addis Ababa University
2	Abiti Getaneh Gebremeskel	Director, Water Resources Research & Development Directorate	Ministry of Water Resources
3	Alebel Bayrou Weldesilassie (PhD)	Researcher	Ethiopian Development Research Institute
4	Ayenew tessera	Director	Citizens' Solidarity for Campaign Against Famine - Ethiopia
5	Biruk Kebede	Hydrology Expert	Ministry of Water Resources
6	Christopher Scott	Professor	University of Arizona
7	Daniel van Rooijen		IWMI - Ghana
8	Engida Mengistu		Addis Ababa Women's & Children's Affairs Bureau
9	Fekadu Lebecha	Head, Water Resource Management	Oromia Water Resources Bureau
10	Geremew Sahilu	Lecturer	Addis Ababa University
11	Getaneh Gebre		Addis Ababa Environmental Protection Authority
12	Haile Fesseha	Deputy City Manager	Addis Ababa Municipality
13	Kaleab H/Michael	Water Resource Engineer	Ministry of Water Resources
14	Liqa Rashid		IWMI - Ghana
15	Maija Hirvonen		IWMI - Ghana
16	Melesse Lemma		National Meteorological Agency
17	Mengistu Teklemariam	Water Conservation and Demand management option	Addis Ababa University
18	Meskir Tesfaye		Forum for Environment
19	Semu Moges		Addis Ababa University
20	Tamiru Gedefa	Urban WSSP Desk Coordinator	Ministry of Water Resources
21	Tewodros Nega	Team Coordinator	Environmental Protection Authority
22	Wondimu Tekle Sigo	Deputy General Manager	Addis Ababa Water & Sewerage Authority
23	Yemane Sahlu	Officer	Urban Agriculture
24	Yilma Seleshi (PhD)	Associate Prof. in WRE	Addis Ababa University
25	Yohannes Zerihun Negussie	Technical Support Specialist	Ministry of Water Resources

URAdapt platform workshop agenda

Date: August 05, 2010 (IWMI)

Venue: IWMI (at ILRI Premises)

Time	Item	Speaker	Remarks	Chair Person
8.30 – 9.00	Arrival and registration of participants			Dr. Yilma
9.00 – 9.15	Opening & welcome	Project Leader URAdapt		
9.15 – 9.30	Opening remarks	Possible speaker:	Haile Fisseha, Deputy City Manager	
9.30 – 9:40	URAdapt project	Liqa Raschid-Sally	Project Overview	Dr. Semu
9.40 – 10.00	Progress of URAdapt Project	Ato Geremew	Progress on research	
10:00 – 10:50	***Questions and discussion***			
10.50 – 11.10	*Coffee & tea break*			
11.10 – 11:30	Preliminary outputs of climate change and hydrological modeling	Semu Ayalew Abayneh A.	Results of climate downscaling for AA Preliminary outputs of the hydrological modeling	Dr. Chris
11.30 – 12.45	***Questions and discussion***			
12.45 – 14.00	***Lunch + Networking***			
14.00 - 14.15	Urban water balance modeling in VENSIM and findings from the PhD research	Daan Van Rooijen	Modeling results of water management for Addis	Dr. Liqa
14.15 – 14.30	Water Conservation and Demand Management Options for AA	Mengistu T.	Various adaptation techniques based on water conservation and change in water use device	
14.30-14.50	Water Re-Use, growing cities and resilience to climate change	Christopher A. Scott		
14:50-15:30	***Questions & Discussion***			
15:30 – 16:00	***Coffee & tea break***			

16:00 – 17:00	Discussion and way forward	Group work and presentation in plenary	Objective : to stimulate thinking, bring up urban water problems onto the agenda and to understand the perception of decision makers about the vulnerability of the sector.	Dr. Alebel
17:00 – 17.30	Wrap-up and closing	Liqa Raschid-Sally		

Annexe 1

Final Research Agenda for the Addis Ababa URAdapt Project (July 2009 – June 2011

No.	Research Theme	Research Topics
I	**Downscaling Future Climate Change** *Leader: Dr. Semu* *Researcher: Semu &M.Sc Students*	1.1: Overview and Evaluation of suitable downscaling techniques
		1.2: Downscaling of future climate change projections:
		1.2: Sensitivity Analysis of the various parameters of the downscaling model that affects the accuracy of the model output
1I	**Climate Change and Water Availability** *Leader: Dr. Semu* *Researcher: Semu & M.Sc Students*	1.1 Impact of Climate Change on Water Availability to Urban Cities: A Case of Addis Ababa City Impact of climate change on reservoirs. Annual volume of water available.
		1.2: Impact of Climate Change on extreme Hydrological events Through modeling by extracting extreme values etc.
		1.2: Impact of Climate Change on ground water situation around Addis Ababa MODFLOW: NOT SURE ABOUT DOING
III	**Climate Change and Water Quality** *Leader: Dr. Semu/Geremew* *Researcher: Geremew& M.Sc Students*	3.1: Evaluation of the current and future water quality situation of Addis Ababa
		3.2: Evaluation of Water quality situation under climate change scenario
IV	**Climate Change and Dynamics of Urban-Rural Interaction** *Leader: Geremew* *Researcher: Geremew, Semu & M.Sc Students*	4.1: Evaluation of current and future Urban-Rural water interactions: A case of Addis Ababa and sprouting towns around Addis Ababa
		4.2: Dynamic of Urban-Rural water interactions under Climate change scenario
V	**Climate Change, Water Management and community** *Leader: Geremew* *Researcher: Geremew, Daan & M.Sc Students*	5.1: Evaluation Water/Waste water manage aspects of Addis Ababa with and without Climate change scenario - VASIM Approach
		5.2: Mapping of vulnerable groups and climate change hot spots: A case of Addis Ababa and surrounding areas
VI	**Climate change and Institutions, Policy and Governance structures** *Leader: Geremew* *Researcher: Geremew & Dr. Alebel*	*6.1: Assessment of current and future institutional, Policy and Governance Aspects of interacting Urban-Rural communities*
		6.2: Evaluation of IWRM approach for Sustainable Urban-Rural interaction under climate change scenario

Note: we have discussed and summarized the research themes from I to V with GEREMEW. The Last item (VI)was not discussed with Dr. ALEBEL. I think the research theme is in that category and the topics will be accordingly modified.