



**REPORT ON RAIN WATER HARVESTING (RWH) FOR RESILIENCE TO
CLIMATE CHANGE IMPACT ON WATER AVAILABILITY IN GHANA
WORKSHOP**

**HELD AT COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH OF THE
SCIENCE AND TECHNOLOGY POLICY RESEARCH INSTITUTE**

(CSIR – STEPRI), ACCRA – GHANA

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Acknowledgement

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LIST OF ABBREVIATIONS AND ACRONYMS

CONIWAS- Coalition of NGO' in Water and Sanitation

CSIR- Council for Scientific and Industrial Research

CWSA- Community Water and Sanitation Agency

EPA- Environmental Protection Agency

GETFund- Ghana Education Trust Fund

GNPC-Ghana National Petroleum Corporation

GREDA-Ghana Real Estate Development Agency

GSA-Ghana Science Association

GWCL-Ghana Water Company Limited

MEST-Ministry of Environment Science and Technology

MOFA-Ministry of Food and Agriculture

MWRWH-Ministry of Water Resources Works and Housing

NCF-Nordic Climate Fund

NDF-Nordic Development Fund

NRWHS-National Rain Water Harvesting Strategy

PET-Specialised plastic bottles for disinfecting water using sunlight

PURC-Public Utilities Regulatory Commission

RW- Rain Water

RWH-Rain Water Harvesting

SINTEF- Stiftelsen for Industriell og Teknisk Forskning

SODIS- Solar Water Disinfection

STEPRI-Science and Technology Policy Research Institute of CSIR

STIP-Science Technology Innovation Policy

UV-Ultra Violet

WRC-Water Resource Commission

WRI-Water Research Institute of CSIR

INTRODUCTION

Background:

Ghana abounds in water resources with an estimated annual renewable resource of more than 2,200 m³ per capita. Statistics indicates that the rate of abstraction of these water resources for consumptive purposes is relatively small. Climate change is real and its impact on the environment is enormous. Evidence of this is being felt all around including society, agriculture yields, forest cover, human health and water resources among others. The effect of climate change on water resources is very crucial as it has rippling impacts on other sectors. Studies have shown that water availability will diminish under a changed climate due to lower precipitation, decrease in run-off (20-50%) and reduction in groundwater recharge (5-20%) by 2020 (CSIR-WRI,2000).

As a result, this has led to a relative decrease in piped water supply to urban and peri-urban households. For a majority of households in Accra, water is either rationed due to rapid urbanization, high demand and inadequate supply or they are without piped water supply. There is therefore an acute water supply challenge facing the city of Accra. These areas not covered by the current water supply system have to depend on private water tanker service providers for their water supply coupled with the water quality concerns.

In view of this worsening trend, there is a great need for a sustainable alternative source of portal water for human consumption to address this acute water problem facing urban and peri-urban areas in Ghana. In spite of this challenge, large volumes of rain water are allowed to go waste each year causing devastating flooding in the city.

Rain Water Harvesting (RWH) systems is one of the innovative technologies found to meet the increasing water supply deficits to households and institutions in Ghana.

It is against this background that the Norwegian research institute SINTEF in collaboration with the Science and Technology Policy Research Institute (CSIR-STEPRI) and Water Research Institute (CSIR-WRI) both of the Council for Scientific and Industrial Research have developed a two year joint research and development project on Rain Water Harvesting (RWH) for resilience to climate change impact on water availability in Ghana. The overall objective of this project is to increase resilience to climate change impact on water availability by holistic sustainability assessment and implementation of appropriate RWH

technology for small-scale application and business development based on standardised design in Ghana.

The workshop held on 19th February, 2013 at CSIR-STEPRI Auditorium, Accra was to launch and present the objective and the implementation plan of the project to stakeholders for their inputs from their respective perspective to enrich the quality of the project. This also offers a platform for researchers to interact with the private sector to explore ways to solve the needs, challenges and expectation of industry through research. This report is a synthesis of the main activities that took place at the workshop.

OPENING EVENTS

The workshop started at about 9:25am with an opening prayer and introduction of chairman by Mrs Justine Onumah followed by chairman's acceptance remarks who in turn requested self-introduction of all participants.

Chairman's acceptance remarks – Dr Joseph Ampofo, Director CSIR - WRI

In his acceptance remarks, Dr Ampofo apologised for the inability of Dr A. B. Salifu, Director General of CSIR who was originally tasked to chair the workshop but had to attend to an equally important event elsewhere. Dr Joseph Ampofo expressed his sense of honour to act in his stead to chair the event. He also expressed his gratitude to the Nordic Climate Fund (NCF) and Nordic Development Fund (NDF) for initiating and sponsoring the project and emphasised the importance of the collaboration between SINTEF, CSIR-STEPRI and CSIR-WRI.



Fig 1. Dr Joseph Ampofo delivering the chairman's opening remarks.

This research project, he said, is the second collaborative research project involving SINTEF and CSIR – STEPRI. This he hopes will bring enormous benefits to the Ghanaian society. He stated that from the colonial time, Rain Water Harvesting (RWH) has been in practice but

with the added innovations to the design such as purification unit among others will greatly improve the quality of the water for drinking purposes. He also indicated that the project will not only seek to increase resilience to climate change impact on water availability in the country and amount of water for domestic use, but also promote the technology and development of business around it for local artisans. This is an indication that research is going to a different level by tailoring research findings and activities to addressing problems in society. He also said that much as research activities like these are important in the national development, effort should be made to communicate the findings of the project to the relevant stakeholders including policy makers to enable them to make informed decisions on the RWH systems in Ghana. He called for the active participation of all present and hoped that at the end of the day useful conclusions will be drawn from the workshop which will go a long way to developing feasible and vibrant RWH systems in Ghana.

Welcome Statement - Dr George Essegbey, Director of Council for Scientific and Industrial Research – Science and Technology Policy Research Institute (CSIR-STEPRI)

In delivering his welcome address, Dr G.O Essegbey deemed it a privilege to set off the workshop. He welcomed all the participants and especially the project counterparts from Norway.

He stated that the subject of the project is about climate change adaptation and with the experience and partnership with SINTEF success of the project will be achieved. He went on to explain the role of CSIR-STEPRI in the project which is basically to disseminate Rain Water Harvesting (RWH) Technology in Ghana. This underscores the diversity of roles the Institute is expected to play apart from Science Technology and Innovation Policy research and formulation in Ghana. He stated that the institute's main line of research activities is socio – economic studies on technologies and innovation. The project, he said, presents a huge challenge for STEPRI, since climate change adaptation is one of the development priorities of this country. Taking up this task is an extension to another core mandate of STEPRI; to facilitate diffusion of technology and innovation that will address these fundamental challenges. Dr Essegbey also expressed his admiration for partnering Water Research Institute of CSIR on a common project like this.

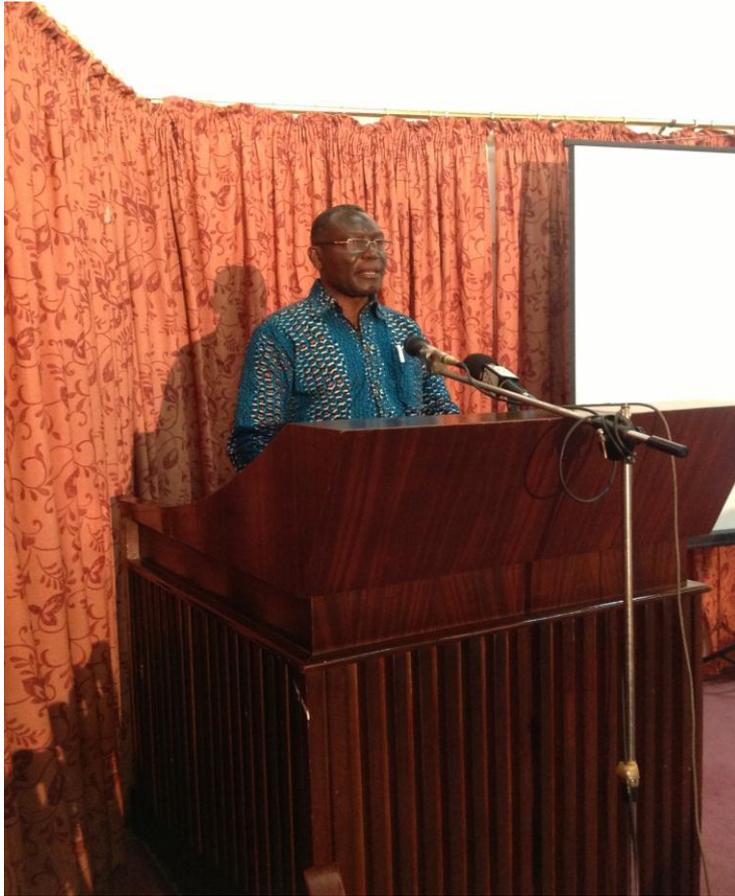


Fig 2. Dr George Essegbey delivering his welcome address.

He hoped that more projects will come up which will call for both institutes linking up to combine their expertise to address national problems. He also expressed his gratitude for the partnership with the private sector saying that this project extend beyond research activities. Though standard models for RWH system will be developed, the project will seek to explored opportunities for entrepreneurship in the installation of the system for private homes and educational institutions. This has become very necessary because commercialisation of research findings has been identified as a means of ensuring sustainability of such innovation for the benefit of the masses.

Presentation of the project: Sigrid Damman, Project Leader, SINTEF Technology and Society Norway

Sigrid Damman started by commending the Chairman and the Director of CSIR-STEPRI for their kind and warm welcome remarks and also thanked participants and stakeholders for making time to attend the workshop.

In introducing the project, she stated among others that, it is being funded by Nordic Development Fund (NDF) and that the focus is on climate change adaption. Water availability is one of the critical dimensions within the climate change impact challenges for Ghanaian economy and it is an area which SINTEF is concern about. During raining season parts of the country especially Accra experiences flooding yet there is an acute water shortage facing the city. It is in the light of this, that SINTEF in collaboration with CSIR-STEPRI and CSIR-WRI came up with this research project which is aimed at not only ensuring resilience to climate change impact in Ghana through the RWH systems in Ghana but also offer opportunities for business development from the technology for local artisans.



Fig 3. Sigrid Damman Project leader introducing the project

She talked about her institute SINTEF which is one of the biggest research institutes in Scandinavia, staff strength, source of funding for their operations, core mandate and focus of their research activities. Very characteristic of SINTEF is that most of their research are tailored to both private and public sectors within Norway and outside and funded mainly by the private sector. Sigrid Damman presented the implementation plan for the project which includes development of model RWH systems, standardisation of the models, installation of the systems in twenty (20) houses and two (2) schools, dissemination and promotion of the technology and the training of 30 artisans on the technology. She emphasized that the project aims to be innovative, not only in the way of advancing new RWH solutions, but also in the way it will mobilise key stakeholders to facilitate sustainable business development among the artisans to be trained in the project. .

She believed the workshop will give stakeholders the platform or opportunity to make useful contribution from their respective perspective for a successful implementation of the project in addressing the acute water shortage facing Ghana which has come about due to factors including climate change through the adoption of RWH systems as alternative source of water.

Keynote Address by Ms Salimata Abdul-Salam Chief Director of Ministry of Environment Science and Technology (MEST)

Ms Salimata Abdul Salem expressed her joy and pleasure to be at the workshop on this Rain Water Harvesting project. She recounted her interaction with the project team from Council for Scientific and Industrial Research (CSIR) and a representative from the funding agency in her office to discuss the Ministry's view of the project and its potential impact in Ghana. She believes with confidence that the project will impact positively on the people of Ghana.



Fig 4. Ms Salimata Abdul Salam Chief Director MEST delivering the key note address.

Ms Salimata was happy because the workshop will present the project objectives and activities to stakeholders and also invite their professional input that will enrich the quality of the research from their respective perspectives. She also commended SINTEF, the management of the Science and Technology Policy Research Institute (STEPRI) and Water Research Institute (WRI) of CSIR for undertaking the initiative to organize this workshop and inviting the Ministry to share their potential benefits of the project.

Ms Salimata thanked Nordic Development Fund (NDF) for sponsoring the project which seeks to support Ghana's efforts in its development agenda especially in the area of climate change adaptation. She also mentioned that SINTEF is well known in Ghana especially for those in the Ministry of Environment Science and Technology (MEST) because of the

existing collaboration between them and CSIR – STEPRI in the NKOSOO 2015 project which was aimed at helping to build a dynamic local content for the country’s emerging oil and gas industry.

Ms Salimata also reiterated the objective of the project which is to promote the adaption of Rain Water Harvesting (RWH) systems in Ghana as a means to increase resilience to climate change impact on water availability in Ghana. This project objective falls in line with one of the objectives of the National Environmental Policy of minimizing the impact of climate change through adaptation technologies. She said the project has come at the right time when the impact of climate change is being felt in all sectors of the economy. Many households are facing big challenge of accessing portable water for domestic purposes in the urban and peri-urban areas in Ghana. She believed the project came at the right time to meet this pressing need by providing alternative source of water particularly for those in the urban and peri-urban communities with inadequate or no piped water supply.

Ms Salimata commended CSIR–STEPRI for their role in helping the Ministry in the preparation of National Science Technology and Innovation Policy (STIP) through a participatory process.

She mentioned that the research institutes are coming up with some interesting findings and therefore called on key industry players to partner and invest in the knowledge acquisition to build the requisite capacities, skills and standards to boost productivity. In addition, she is hopeful the project will also provide the empirical basis which will shape the National RWH Strategy concretizing the RWH objectives as stated in the National Water Policy in Ghana.

Ms Salimata appreciated the government of Norway for their support to Ghana including the establishment of environmental data, monitoring and information system, capacity building in the environmental assessment, spatial and land use planning and coastal zone management, the environmental management of oil and gas sector, capacity building of Ghana National Petroleum Corporation (GNPC) and Environmental Protection Agency (EPA), as well as the drafting of the Petroleum Revenue Management bill and hoped the cordial relationship between the two nations will continue for many years for the mutual benefit of both countries.

She concluded by pledging the ministry's full support to the project and hoped the launching of the RWH project will pave the way for many more innovative technologies to be developed to addressing the acute water problem facing the nation. While waiting with great expectation to the dissemination workshop at the end of the project with to share with stakeholders the success of the project, she commended SINTEF, STEPRI and WRI for organizing this workshop and wished all participants fruitful presentations and deliberations.

In his closing remarks for the opening session, Dr Joseph Ampofo expressed his gratitude to the Ministry of Environment Science and Technology (MEST) for pledging their full support to the project and also thanked all the participants for taking time off their busy schedules to be part of the workshop which has assembled varieties of experts in the water sector.

He stated that climate change is a phenomenon which has always been with society but its effect has intensified over the years hence the need to develop adaptation technologies to withstand it. The chairman expressed his appreciation to the Nordic Development Fund for supporting the project to train artisans and improved upon the skills they already possess in the installation of RWH systems.

According to Dr Ampofo, RWH is not new in Ghana but the issue was with the way the water was not treated to safeguard its use for drinking and other domestic purposes. This is the reason behind the development of this new technology which will maximise the collection of the rain water but also has a treatment component for the purification of the water to serve these purposes including drinking. He hoped with the contribution from stakeholders gathered, a lot more will be achieved.



Fig 5. Dr Joseph Ampofo and Sigrid Damman speaking to the media.

TECHNICAL SESSION 1: *Chairman: - Dr Joseph Ampofo, Director CSIR – WRI*

The session was devoted to presentation by facilitators from the collaborating institutes for the project. The focus of the presentations were on the relevance of the project to climate change impact in Ghana, technical options considered, and the environmental, economic and social sustainability associated with RWH in Ghana, given the needs and expectations among potential users/buyers of such systems. The following are excerpts from the presentations made by the institutes namely: CSIR – WRI, SINTEF Building and Infrastructure and CSIR – STEPRI.

PRESENTATIONS

Dr. Barnabas Amisigo (CSIR-WRI): Climate Change impact and RWH Adaptation in Ghana.

Dr Amisigo delivered the first presentation and compared Ghana's current water resource statues with the rate of abstraction for agricultural and domestic use. The difference indicates that a greater proportion of the resources are not consumed with an annual renewable water resource of more than 2200m³ per capita per year.

Despite this huge water resource reserve, the effect of climate change is having serious impact on the available water resources. This will result in the diminishing water availability because there will be low precipitation, enhanced evaporation especially in the savannah regions, more drought and a decrease in the run off. Apart from this there are challenges of partial distribution of rainfall in the country which gives cause for concern. While rainfall is moderately low in the North and Eastern corner of the country, it is high in the Southern, Middle and the Western part of the country.



Fig 6. Section of participants

He said that in order to adapt to these climate change impact, the key requirement to reduced vulnerabilities and increased resilience of communities and households is the adoption of rain water harvesting and storages system such as surface systems, boreholes and paved surfaces.

In his conclusion, he reaffirmed RWH as an appropriate adaptation measure at the household level against the anticipated impacts of climate change which will impose additional stress on our water resources and its availability.

Dr. Fred Amu-Mensah (CSIR – WRI): Rain Water Harvesting Consideration for National Roll out

Dr Amu-Mensah reiterated the fact that the flow of piped water to urban households is decreasing due to an increase in population and new development. Concerns have also been raised about the quality of piped water for drinking for which reason people are resorting to bottled and sachet water. The flow of piped water to peri-urban areas does not exist and access to water for domestic purposes is a huge challenge for these communities. Ironically however large quantities of rainwater go waste and sometimes create problems like flooding in some parts of the country due the lack of technology.

Dr Amu-Mensah stated that Rain Water Harvesting can help meet this need in areas with intermitted or no flow of piped water to their homes. He further stated the reasons for the need to have RWH systems and these include; increasing burden to expand piped water system despite efforts, potential reduction in burden by employing rainwater harvesting for not drinking uses. He also presented a trend in water supply coverage from 2003 – 2009, water supply deficits in the greater Accra and the supply and demand deficit in various regions.

In conclusion Dr.Amu-Mensah believed RWH if rolled out across the urban and peri-urban areas would increase the water available for domestic use thereby improving the acute water problem facing these communities.

Dr. Kamal Azrague (SINTEF Building Infrastructure, Water and Environment): Design options and Sustainability assessment of Rain Water Harvesting systems in Ghana

Dr Azrague started by presenting the organogram of SINTEF, number of employees in his unit Water and Environment and their core mandate which is research on water and wastewater systems and treatment technologies.

Dr Azrague outlined a number of challenges in respect of water resource which include shortage of treatable water, increase urbanization, increase quality concerns and stringent consumer demands and prescribed water recycle from water use towards water reuse as the solution to these challenges. He also made mentioned of the core competence of his department which are mainly in the area of drinking water, industry and municipal waste water, urban runoff, fish farming and waste resources & industrial ecology.

Dr Azrague emphasised that the overarching goal of the project which is to increase resilience to climate change impact on water availability by holistic sustainable assessment and implementation of appropriate RWH technology on a small scale. He also reiterated the need for rainwater harvesting and the basic principles of rainwater harvesting and feasibility of RWH system.



Fig 7. Section of participants

Dr Azrague went further to present the activities for assessment of different technical alternatives for the small scale RHW system, development of standardized design criteria for appropriate and innovative model for RWH systems for households and schools. He also outlined the different innovative components to the system including Electrical UV disinfection unit and UV lamps, SODIS batch, SODIS method using PET bottles and RW control panel and monitoring unit.

In conclusion, Dr Azrague said for the project to be sustainable, the quality of the water in respect to environmental impacts, the system costs, socio-cultural acceptability and potential for dissemination should be ensured.

DISCUSSION ON TECHNICAL SESSION 1 PRESENTATIONS

The session was devoted to comments, suggestions as well as questions and answers relating to all the presentations given during the first technical session. The following are excerpts of what transpired during this session.

Dr Joseph Ampofo wanted to know the difference between the kind of RWH system Dr Azrague proposed and the ones already being used in Ghana. In responding, Dr Azrague said with the added new technology in addition to what already exists in terms of collection and treatment, will greatly improve the quality of the water even for drinking purposes.

A participant asked the measures put in place to guard against ground water infiltration to underground storage. The response to this question was that there are various ways of tackling this imminent problem including the use of water proof cement in the construction of the tanks and that the project will explore all other possible alternatives.

Another request was made for further explanation on the cost benefit analysis of adopting the technology. The response to this question was that, though the initial cost of the system is reasonably high, a number of factors come into consideration in arriving at this cost, including the size of the storage tank as well as the kind of treatment system one requires. In general terms, compared with existing systems, it pays to invest in RWH system.

Another participant asked how people perception about the safe use of rainwater will be dealt with and the communication strategies designed to clear this perception.

On perception, the best way to address it is by providing data on the quality of the water as compared to those from other alternatives. One of the key activities of the project is the monitoring of the quality and quantity of water from the system for one year after installation. The project data will therefore compare the rain water to treated piped water. He also made a point that rainwater becomes dirty if it continuously stored in heavy industrial area or under rusted roofing sheets.

A question was asked if there is effective linkage between researchers and industry players on these alternative methods. A representative from Ghana Real Estate Developers Association (GREDA) responded by saying that though the gap is wide, CSIR-STEPRI has taken a bold

step to work together with them. He attests to the fact that a number of meetings have taken place between them and STEPRI which he believed going forward will bring them closer. Considering the RWH options proposed by the project and since space availability in Accra is very limited, he opts for overhead water storage facility for the system. He also charged the technical team to find solution to turbidity and colour of the harvested rain water as these are the main complaints from customers of the Ghana Water Company Limited providers of pipe water in urban Ghana.

A participant posed a question as to who the beneficiaries of the project are, and how is the harvesting of the water done (size). In responding, the presenter stated that the installation of the system is capital intensive by Ghanaian standard this is seen as a long term investment and is opened to all especially those with an investment in mind and willing to bear twenty-five per cent of the cost of installation. The size will depend on the number of persons, needs, demand and affordability. The system's cost will pay for itself over a long period compared to purchasing water in bits and pieces.

A question was asked whether figures for runoffs have changed over time. The response affirms this change, but this is not in the same location.

Dr. Bekoe also asked a question to estate developers whether it is the cost of installation or lack of knowledge that is inhibiting the implementation of rain water harvest technology. Both factors come into play in deciding implementing the technology. But from the estate developers point of view if this technology is incorporated in Ghana's building code, it will go a long way to enhance its implementation in the new buildings springing up.

The siting and sanitation aspect of the project implementation should be considered. Are the materials local or imported such that it will be less expensive? The project team promised to take those concerns into account as they continue with the feasibility study. A participant also recommended siting of the storage tanks on overhead facilities as space is problem in most households in Accra.

On his part, Kanyi Christian from Raincoat Roofing systems an expert in the area, suggested more awareness creation to the general public to know the cost benefits of installing the system. In addition, he recommended that the design of the rain gutters should be done in such a way as to allow for periodic maintenance.

Ghana Science Association (GSA) mentioned that they organised a workshop on RWH some few years ago. All the presentations were published and the then Ministry for water resources promised to incorporate the rain water harvest technology in all government buildings. Since this has not happened yet, GSA appealed to the Director of Ministry of Environment Science and Technology to pursue it in future.

TECHNICAL SESSION 2: *Chairman Dr George Essegbey, Director CSIR – STEPRI*

The chairman of the session introduced presenters for technical session 2; Mr Ben Ampomah Executive Secretary for Water Resource Commission (WRC) and Mr Roland Asare, Research Scientist from CSIR – STEPRI. The following are the highlights of their presentations.

PRESENTATIONS

Mr Ben Ampomah, Water Resource Commission: National Rain Water Harvesting Strategy in Ghana.

Ghana is drained by 3 river systems the Volta, Coastal and South-western system. These systems contribute a total of 38.3 billion m³ and the consumption of water demand is estimated to be 5.13 billion m³ of surface water resources in addition to ground water which is available in various geological locations in the country.

Against this backdrop, Mr Ampomah enumerated the rationale for the implementation of RWH systems in Ghana and this includes increasing demands on water availability, achieving equity in access to water supply for peri-urban and urban poor to meet basic needs at an affordable cost and to make provision for National Water Policy for RWH.

Like previous presenters, he stated that RWH is not new in the country with colonial RWH installations in parts of the country. Most of these RWH systems have run down because of lack of maintenance. He also said RWH can be practiced in the peri-urban residential area, schools and health centre for domestic and irrigation purposes.

Mr Ampomah also presented the National Rain Water strategy framework for Ghana, outlining the vision for water resources management and water service delivery, strategic objectives, actions for promoting RWH, a *road-map* for enhanced planning, development and management of domestic RWH in the country.

He said the Water Directorate of the water sector and WRC will provide Policy and coordinate to carry out practical implementation of NRWHS with assistance of other stakeholders, including MOFA, GWCL and CWSA.

On the side of managing the implementation Mr Ben said various roles and responsibilities are assigned to various companies and on monitoring and evaluation he said operational and progress indicators have been developed to initially monitor progress.

Mr. Roland Asare, CSIR – STEPRI: Implementation of the Project, Training & Business Development strategy

Mr. Roland Asare presented on the implementation of the project, training and business development strategy of which he stated that climate change is real and its impact on the environment is enormous.

He mentioned that the water sector is one of the areas that are being heavily impacted by Climate change and that the impact on water resources is crucial as it has rippling effects on the other sectors of the economy. The country has therefore been presented with the need for a sustainable alternative source of portable water for human consumption. He said Rain Water Harvesting system is one of the innovative technologies that are found to meet the short fall of water supply to households & institutions in Ghana.

Mr Asare also presented the potential of adoption of RWH systems in Ghana saying water has become an essential commodity in the world.

As part of the project, 30 artisans would be selected and trained in the construction and installation of the RWH system. The selection of beneficiaries will be based on certain criteria yet to be firmed up under the business development module, the training will consist of three components; classroom training, individual advice & workshop. A test will be conducted at the end of the program to assess their level of acquisition of skills and knowledge relating to RWH systems and a certificate awarded to the participants

Mr Asare also made mentioned that there would be stakeholder dialogue to evaluate and promote the model RWH system.

In conclusion Mr. Roland Asare reiterated the potentials for adoption RWH systems in Ghana being great, given the fact that current water supply in the urban and peri-urban areas is facing serious challenges and alternative source of water supply is urgently needed to meet

the short fall in supply. And with the involvement and contribution from key stakeholders, this RWH project will achieve the desired objectives.

DISCUSSION ON TECHNICAL SESSION 2 PRESENTATIONS

Dr Samuel Ntewusu wanted to know what the project means by urban and peri-urban areas as these have appeared in all the presentations. In responding Mr Ampomah stated that in the context of the project peri-urban refers to areas with characteristic of urban settings but living conditions portrays rural setting.

A participant suggested that in the creation of awareness about the technology, documentary should be considered under the promotion and marketing activity of the project. This idea was welcomed by the project team. Another participant also recommended proper cost benefit analysis of adopting the RWH system as against purchasing water from tankers in order to convince potential buyers. A participant from the land and water management unit of the Ministry of Food and Agriculture (MOFA) wanted to know his unit stand to benefit from the project since the focus seem to be mainly on households and not on agriculture. In response to the question, Mr Asare assured him that though the project is currently piloting the system in households and schools Accra, the overall aim is promoting the system to cover all sectors including agriculture where its application in irrigation purposes will be very useful.



Some of the participants networking during recess

How do we deal with the issue of house ownership because there may be more tenant households than home owners and people may not be ready to invest in something that does

not belong to them. Presenter responded by saying that the project is demand driven so if a tenant agrees to invest in system she/he must do so with the consent of the landlord.

A question was asked if certificate of competency will be given to the trainees after completion of the one year training so they can use it in other places to earn a living. This was affirmed by one of the project team members and that a certificate will dully be issued to the trainees. Dr.Amu-Mensah suggested as part of training for the artisans the subject of customer relation should include after sales services, follow-up maintenance regimes, functionality inspections should be considered. In addition, he also suggested the dissemination strategies should also target financial institutions who could structure loan schemes to target prospective RWH owners.

A participant asked if the training of artisans is going to be free or paid for and what are the criteria for selecting them? The cost of the training will be borne by the project and the project team are still working on the criteria for selection and will be put out when completed.

A participant suggested that in the designing of the system, the use of ferro cement needs to be looked at in order to bring down the cost of the system. Much as the use of local materials is being promoted to enhance adoptability, a call was made to the experts to guard against the use of roofing material made of asbestos to prevent the water from contamination

A question on how far the RWH policy has gone was asked, saying whether at its current state it could be considered a policy document or a working tool. Mr Ampoma in his response stated that there is the need to look at the institutional aspect of it before any proper coordination could be done. He went on to state that the strategy has not been adopted and there is a need to look at its adoption before rolling out the implementation plan.

One participant did not agree to Mr Asare's statement that when working middle class earn a monthly salary of GHC2,500-GHC 10,000 it suggests that many people can afford to purchase RWH systems. Considering that most people move into their homes when they are about 30 per cent completed, they do often not have money to spare for RWH systems. Affordability, Mr Asare answered, boils down to what priority people put on water, so one may have uncompleted building but have water availability as a prime priority.

One participant also suggested that final analysis must be compare to cost of housing and the RWH technology.

Closing Remarks

The chairman, Dr George Essegbey in his closing remarks expressed his pleasure about the project and the alternative use of the harvested water not only for direct consumption but also for sanitation purposes. He expressed his excitement with the constructive comments and deliberation by participants. He assured participants the project team will have a look at all the comments and suggestions and incorporate them into the project where necessary. He also added that the private sector will actively be engaged in this project.

The workshop was concluded about 1:35pm with a closing prayer by Mrs Justina Onumah and was rounded off with a joint lunch and networking/informal discussion among the participants.

ANNEX 1

LIST OF PARTICIPANTS

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ANNEX 2

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ANNEX 3

Media Coverage

[Build Capacities To Boost Competitiveness In Rain Water Harvesting- MEST](#)

Wednesday, 27 February 2013 15:30

Mrs Salimata Abdul Salam, Chief Director of the Ministry of Environment Science and Technology, has stressed the need for investing in knowledge acquisition to build capacities to boost competitiveness in Rain Water Harvesting Service delivery.

“Key industry players should be prepared to invest in knowledge acquisition to build the requisite capacities, skills and standards to boost their competitiveness to effectively contribute their quota to the overarching objectives of development particularly towards the realisation of the country’s development agenda” she said.

Mrs Abdul Salam made this statement at a workshop on a project titled “Rain Water Harvesting (RWH) for Resilience to Climate Change Impact on Water availability in Ghana”

The Workshop was to provide the platform to present the Project objectives and activities to stakeholders and invite their professional inputs to enrich the objectives of the Research.

Sponsored by the Nordic Development Fund, the Project is a collaborative research between SINTEF, a leading research institute in Norway, the Science and Technology Policy Research Institute (STEPRI) and the Water Research Institute (WRI) of the CSIR.

Mrs Abdul Salam noted that the Project was in line with one of the objectives of the National Environmental policy of minimising the impact of climate change through adaptation of technologies.

“I believe that the rain water harvesting project came at the right time to meet this pressing need of providing alternative source of water particularly for those in the urban and peri-urban communities with adequate or no piped water supply” she said.

According to her, the Ministry had engaged all stakeholders in the preparation of the Science and Technology Innovation Policy, with the conviction that the Ministry owed it a responsibility to help develop the Ghanaian industry.

“I would like to assure the industry of the availability of local innovation and competence to support the sector” she stated.

Dr Abdulai Baba Salifu, Director General, CSIR said the Project would not only increase resilience to climate change impact on water availability, but would promote the technology and develop business around it for local artisans, “this I believe is the demonstration that research is going to a different level by tailoring research findings and activities to addressing problems in society”

He expressed the hope that the findings would help guide policy makers in their decisions, as well as support their policies with justifications from research findings, especially in relation to the National Water policy.

Dr George Essegbey, Director of STEPRI said the Project was to promote the adoption of Rain Water Harvesting Systems in Ghana as a means to increasing resilience to climate change impact on water availability.

Source: GNA

1. <http://www.ghana.gov.gh/index.php/news/general-news/20170-build-capacities-to-boost-competitiveness-in-rain-water-harvesting-mest-56930>
2. <http://www.ghananewsagency.org/science/build-capacities-to-boost-competitiveness-in-rain-water-harvesting-mest-56930>