Sustaining groundwater safety in peri-urban areas; GROUNDWATER 2030

STARTUP STARKHOLDERS' WORKSHOP

HELD ON 13TH SEPTEMBER 2013 AT

KISUMU HOTEL-KENYA

DRAFT REPORT

SEPTEMBER 2013

University of Southampton | VIREO | University of Surrey | University of Bristol

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Abbreviations

CIDP	County Integrated Development Plan
DFID	Department for International Development, UK
JOOUST	Jaramogi Oginga Odinga University of Science and Technology
KISIP	Kenya Informal Settlement Improvement Programme
KIWASCO	Kisumu Water and Sanitation Company
LBDA	Lake Basin Development Authority
NEMA	National Environment Management Authority
NGO	Non Governmental Organization
UPGro	*Unlocking the Potential of Groundwater for the Poor*
VASAG	*Virus Analysis of Shallow African Groundwater*
VIRED	Victoria Institute for Research on Environment and Development
WARMA	Water Resources Management Authority

1.0 Introduction

This report presents the results of a workshop held on the 13th of September 2013 at Kisumu Hotel in Kisumu City. The workshop was organized as a start-up activity of *Groundwater2030* project. *Groundwater2030* is a pilot project that aims at assessing how far the poor in Kisumu, Kenya, are exposed to unsafe groundwater, both now and in the future. It is a one year catalyst project, funded through the Natural Environment Research Council- Department for International Development programme known as "*Unlocking the Potential of Groundwater for the Poor* (UPGro). UPgro is a new 7-year interdisciplinary programme that aims to build evidence to support sustainable groundwater use in sub-Saharan Africa and *Groundwater2030* is one of the pilot projects it is engaged in among others in parts of Africa.

The Groundwater2030 project is to be implemented in poorer neighborhoods in Kisumu where many households are forced to improvise ways of meeting their water supply and sanitation needs. They rely on a mix of pit latrines and shallow wells, potentially exposing them to contaminated groundwater. The project is expected to interact closely and engage with key stakeholders in its activities to gather evidence of groundwater contamination and extent of community exposure. Its implementation will also provide a timeframe for predicting the outcomes of the different development strategies in respect of water and sanitation that are being promoted by Vision 2030 in these neighborhoods.

The one day workshop was therefore aimed at sharing the concerns and visions of project with the stakeholders to enlisting their active and effective participation in the planned activities right from the start of the project. This was achieved by presenting the objectives and exhaustively discussing the activities of the project. During the presentations, the project team received very positive and enthusiastic feedback which not only enriched the design of the project but also assured the continued support and active participation of stakeholders in the activities of the project.

1.1 Objectives of the workshop

Objectives of the workshop were set as follows:-

- To formally introduce the *Groundwater2030* project to stakeholders
- To secure stakeholder feedback about the project
- To enlist stakeholder support and participation in the project

2.0 Workshop organization and approach

The workshop was organized by Victoria Institute for Research on Environment and Development (VIRED-International) on behalf of the four other organizations that are

collaborators in the project. These include University of Southampton, Jaramogi Oginga Odinga University of Science and Technology (JOOUST), the University of Surrey (UK), and University of Bristol.

A cross section of stakeholders ranging from the academia, County government officers, City council officers, Civil servants, local representative of the National Environment Management Authority, non-governmental organizations, Community based organizations, well owners and water vendors were invited to participate in the workshop. Invitations were extended to a 40 people. In carrying out the invitations, those engaged in the water, sanitation and environment sectors and those engaged in research activities related to the project focus areas were given priority. Out of the 40 people who were invited to the workshop, a total of 39 participants (97.5%) attended the workshop.

The workshop participants were engaged through key note speeches, power point presentations and plenary discussions.

3.0 Workshop Results and Discussions

3.1 Session 1: Preliminaries

a) Climate Setting and Introductions

The climate setting and introductory session was moderated by Mr. Okotto-Okotto. After a session of prayer, **participants** introduced themselves. The session moderator informed the meeting that the 12-month project is being implemented by a consortium consisting of five partner institutions drawn from across the world. The focus of the Consortium and the financiers is to ensure that results of the research are owned by target communities and translated into beneficial use for their own welfare. He emphasized that the achievement of this focus is heavily dependent upon the extent to which the stakeholders, particularly the target communities are involved in the project right from the outset and participate in the activities of the project - hence the purpose of the workshop.

The moderator then proceeded to present the institutional arrangements and organization of the project by introducing the project team as follows;

- **Dr. Jim Wright;** The ***Project Team Leader*** representing the University of Southampton –UK, which is the lead institution in the project.
- **Dr. Steve Pedley;** Representing the University of Surrey-UK,
- **Prof. Stephen Gundry;** Representing University of Bristol -UK,

- **Dr. Lorna Grace Okotto;** Representing the Jaramogi Oginga Odinga University of Science and Technology (Kenya), and
- **Mr. Okotto-Okotto J;** Representing Victoria Institute for Resesrch on Environment and Development (VIRED) International (Kenya). Mr. Okotto-Okotto is the Kenyan project co-ordinator.

b) Opening remarks by the Director General of VIRED International (Prof. Okeyo-Owuor)

Prof. Okeyo-Owuor, who is the Director General of VIRED international, welcomed participants to the workshop. In his opening remarks he noted that Kenya as a country had plenty of water. He cited the recent discovery of huge underground water potentials in aquifers in Turkana in northern Kenya. He noted that the find has been estimated to have the capacity of serving the country for the next 70 years. He Prof. Okeyo-Owuor also noted that huge potentials also exist within the Lake Victoria Basin for both underground and surface waters. Kisumu sits on the edge of the largest fresh water lake in Africa and second largest in the world, besides the huge potential for ground water which can easily be accessed by local communities. Consequently, the challenge in Kenya is not quantity but quality of water.

He noted that there appears to be a general assumption by communities that ground water is clean and therefore need no intervention. However, the contrary is true, especially in urban environments in developing countries such as Kisumu City where water and sanitation infrastructure growth are not in tandem with population growth. This is even more so in the peri-urban areas where piped water supplies are scarce and the majority of residents rely on own sources. The project is therefore of benefit to the community because of its objective to make local communities aware of the state of ground water quality and involve them through applied scientific research.

VIRED as a partner institution is a registered NGO in Kenya, whose aim is to promote research in East and Central Africa through collaborative arrangements. As VIRED we will be relevant to the project implementation in the local context by bringing science home to the target communities and supporting the participatory generation of data to support sustainable community development. The organization will bring a rich of experience of working with the communities over the last two or so decades in the study area into this one (1) year best practice research project. VIRED's pleasure is to see a vibrant and active engagement with the stakeholders in the project and will promote the environment necessary for the achievement of the same.

c) Opening remarks by the Deputy Vice Chancellor – RIO, (Prof. Estambale)

Prof. Ben Estambale -The Deputy Vice Chancellor- Research Innovation and Outreach (RIO) represented the Vice Chancellor of JOOUST, ***Prof. Steven Agong'***. In his opening remarks, Prof. Estambale conveyed the apologies of Prof Agong' and on behalf of the University, reiterated their happiness to be a partner in the "*Groundwater 2030*" project. He noted that the project is exciting and fits very well in the research agenda of JOOUST. The DVC reiterated the University's continued support and commitment to participate in all the phases of the project.

The fact that the consortium has sort to prioritize community and stakeholder participation in the activities of the project before the project kicks off is instructive of the team's desire to ensure continuity and sustainability of project outcomes. He challenged participants to actively engage in the deliberations and generate desired information that will help steer the course of the project to its logical conclusion. He appreciated the fact that this being a catalyst grant project, the deliberation and recommendations would be monumental in designing future follow up projects and further engagement with stakeholders. They would also ensure that all stakeholders team up in harnessing the potential of ground water in a more structured way. This will further improve water security and reduce unsafe exposure to contaminated water as currently is the case with peri-urban communities in the City.

3.2 Session 2: Workshop Presentations

3.2.1 (a) Presentation on Ground Water Situation in Kisumu City - David Mutai

The first presentation was a background paper titled "*Groundwater Situation in Kisumu City*". The paper was presented by Mr. David Mutai, a Hydro-geologist from WARMA. WARMA is a government regulatory agency under the Ministry of Water, Environment and Natural Resources –the department of state for water in Kenya. The paper sought to demystify the topic of groundwater. It provided simplified technical definitions of terminologies commonly used in groundwater management and utilization. Mr. Mutai then proceeded to give a succinct descriptive picture of the ground water situation in Kisumu area in terms of spatial spread, utilization efforts and the core challenges.

Participants learnt that the main means of official exploitation of groundwater in Kisumu City is the use of boreholes which are either private, institutional or communal and protected springs. This means is considered official because it what is officially sanctioned by the government in such environments. A geo-referenced list of about 33 boreholes was presented as an example of the spatial spread of these facilities. In his presentation, Mr Mutai noted that the boreholes exploit the Winam aquifer which is one of the main aquifers within the larger

Lake Victoria South Catchment Area. WARMA is the mandated to regulate the development of these boreholes.

He, however, emphasized that a majority of peri-urban residents without access to piped-water, inadequate technical means and scarce resources tend to resort to the development of own sources to meet some of their water needs. These own sources are predominantly hand-dug shallow wells which cannot exploit deep aquifer groundwater but rely on perched aquifers. Generally however, the problem with the perched aquifers is that the exploit the matrix flow water that is in the sub-surface area and is prone to seasonal contamination from surface runoff and disparate land uses on the land surface in these areas. This puts the populations using these sources at a greater risk of exposure to contaminated water than those who use deep aquifer groundwater exploited by borehole facilities. The informal efforts are not currently regulated by WARMA and have proliferated heavily in the peri-urban areas. In law, they should be regulated to protect citizens from the danger of consuming contaminated water. Generally however, forums that promote dialogue to sensitize communities on the dangers and the need to sanitize the efforts through a community based regulatory process are critical.

He concluded his presentation by articulating current challenges and way forward. Key among these include the need for a comprehensive inventory of all these water facilities, cooperation with groundwater management to identify and protect recharge areas as well as establishing and putting in place community based intervention measures. He applauded the efforts being mobilized by groundwater 2030 as a step in the right direction and critically important in the planning and design of groundwater protection efforts for sustainable out comes. WARMA will give its support and cooperate in the project through its regional office in Kisumu.

(b) Question/Comments from Participants

The presentation elicited the following questions:

1. What is the impact of climate change on groundwater?
2. Why should private well owners be regulated by WARMA requiring that they obtain approval/letter of no objection from KIWASCO before permitting them to construct personal wells?
3. How often do you monitor the water qaulity of the wells and do you have a datbase on the same?
4. Some areas such as Airport area have clay soils - does WARMA control and monitor water quality in such areas?

(c) Responses to the Question/Comments

The following responses were given by the presenter:

- Climate change affects groundwater negatively and therefore mitigation of climate change is key to sustainable utilization of water resources.
- Anybody keen to exploit surface, subsursurface or groundwater must seek permission from WARMA including water companies such as KIWASCO. A letter of no objection from KIWASCO is required because as of now it is the only body licensed to provide water to residents of Kisumu. The other water providers are operating within its area of jurisdiction
- Water quality is monitored by WARMA with participation of some Water Resource Users Associations (WRUAs). Selective sample testing is randomly and routinely done.
- Areas not suitable for borehole drilling are not confined to clayey areas only, but even the water source areas are restricted to avert pollution.

3.2.2 (a) Historical perspectives of the Ground water 2030 Project – Dr. S. Pedley

Dr Steve Pedley gave a presentation titled "*Groundwater2030; Sustaining Groundwater Safety in Peri-urban Areas- A Historical Perspective"*. The presentation focused on how the original project, which has seen part of the present project team engaged with communities of the project since the year 2000, developed from the partner organisations. Participants learnt that the original project was known as *"Viral Analysis of Shallow African Groundwater; identification of risks to well water quality in kisumu*" (VASAG). He noted that objectives of the project changed over time with most of the intended outputs succesfully achived. Dr. Pedley outlined the achievements of the original project as follows;

- Many wells were consistently contaminated with indicator bacteria at very high levels (>1000cfu/100ml) and had high to very high risk scores.
- The wells in Manyatta had higher risk scores and higher levels of contamination than the wells in Migosi.
- Wells with higher risk scores showed greater vulnerability to contamination with high numbers of TTC.
- Conductivity measurements indicated generalised groundwater contamination in Manyatta and Migosi and the trend suggested that contamination was increasing.
- Nitrate concentrations were generally higher in Manyatta

He further noted that two other studies followed the conclusion of the VASAG. These included; A study of the work of *"the small and independent water suppliers in Kisumu" by (Dr Lorna Okotto)* and a "*study of the barriers to access to adequate sanitation in Kisumu and*

how this compares with Kampala and Kigali in Rwanda" (Dr Lorna Okotto: www.3ksan.org). This long and winding history provided the basis for the current project - "*Groundwater2030*". The project will visit sites where data were taken more than a decade ago and determine if any changes have taken place to build new evidence for sustainable utilization of ground water resource in Kisumu and similar citities in Africa.

(b) Question/Comments from Participants

The following questions and comments arose from the presentation:

1. There has existed a shallow well in Nyalenda for a long time that serves many residents. It is not registered and not well fenced. The water quality is wanting since it is used both by local residents and animals. How can the project intervene?
2. Besides the population densities within Manyatta as a major pollutant, did the study identify other sources of pollutants?
3. Is it possible to get the study findings in time especially to relevant organizations that deal with water?
4. Did the study consider issues to do with waste management?

(c) Responses to the Question/Comments

The presenter gave the following responses:

- In the meantime, as local residents within a community (Nyalenda) it is important to form water associations to manage communal facilities such a well since it may not be within the project scope.The earlier study scope did not include waste management.
- The study besides focusing on population density as a major pollutant looked at many other aspects such as environmental hygiene.
- Concerns around project findings dissemination would be considered in the current project by giving appropriate, simple, non technical and meaningful feedback and recommendations to the local community and relevant stakeholders. The results given would be anonymized and privacy maintained, especially at public foums such planned workshops and any presentation at conferences. The previous project gave feedback at a general level through a workshop and specific information to sampled individual well owners.

3.2.3 (a) The Ground Water 2030 Project- Dr. Jim Wright

Dr. Jim Wright's presentation focused on explaining the details of the "*Groundwater2030*" project to the participants. He began by expounding that the project is part of a much larger

Research programme known as *"Unlocking the Potential of Groundwater for the Poor (UPGro)* and is funded by the UK Department for International Development (DFID)/Natural Environment Research Council. The programme aims at promoting **sustainable groundwater use** for the poor in sub-Saharan Africa and will run until 2019.

Participants learnt that "*Groundwater2030"* project is a **12 month** pilot research project executed within the framework of this larger research programme of UPgro. The objective of the project is to assess groundwater quality and use in urban and peri-urban communities in Kisumu, Kenya, both now and in 2030. He explained that the acronym "*Groundwater2030"* was inspired from the Kenyan national planning framework and timeframe of the vision 2030.

The presenter explained that the activities of the project will focus on current and future groundwater exposure and use in the coming 12 months. These will include a follow-up survey of two neighbourhoods of Kisumu City, groundwater quality assessment and socio-economics of groundwater use. A Workshop on future land use scenarios and modelling groundwater use and contamination into the future will also be carried out in a participatory environment.

Dr. Wright noted that this pilot phase of the project will run from Sep 2013 to Aug 2014 with a possible follow-up project that could run the full length of the UPgro programme, from 2014 to 2017. However, such a follow-up project will depend heavily on the outputs and outcomes of this 12 month pilot project. Participants were exhorted to cooperate with the project team and actively participate in the project activities. He explained that this would ensure that the expected outputs and project outcomes are delivered not only for the project but also for the use and management of groundwater in the City by all stakeholders. It was noted that this will be especially critical in the design of a proposal for the possible follow-on project to be submitted to the same financiers for funding support. The team will develop this together with the stakeholders to ensure that the follow-up project addresses the real issues exposed during the current phase and that are sensitive to community/stakeholder groundwater user needs.

Finally, the participants were informed that during the survey, the project team will provide individualized advice about well water quality and safety information to well owners to help improve the quality of water in their wells. He challenged participants to identify;

- The key issues affecting future groundwater use and quality in Kisumu
- Groundwater problems of concern to the participants

- What the project should tackle, now and in the future as a basis for design of the follow-up project.
- Who should be involved and how.

(b) Question/Comments from Participants

i. With re-planning and upgrading of Manyatta, the situation may get better, however the worrying area of concern is the peri-urban area that is experiencing rapid urban settlement without the necessary amenities. What can the project do?
ii. The research findings depict a worsening situation in Migosi and Manyatta, what practical interventions can the researchers in the project undertake?
iii. The project ideas were very good. However, can the resulting technical resports be communicated back to the ordinary people using non-technical language for their benefit to help them their wells?
iv. Feedback mechanissms from previous projects were weak and need to be enhnaced in the case of Groundwater2030.
v. Well owners from Nyalenda, Obunga and Arina asked why they were not included in the project?
vi. Water users associations should be involved in planning, monitoring and utilization of ground water and projects such as these.
vii. Can we develope simple homegrown techniques that can be devolved to schools and the local communities to use for water quality monitoring and make the activity sustainable and continuous?
viii. The Manyatta wells are in the first category of aquifers, the study should indicate the various categories of underground water and aim at improving the livelihoods of Manyatta residents

(c) Responses to the Question/Comments

- The core concerns of the stakeholders were summarized by Dr. Wright as timely communication of results in simple understandable terms, the spatial scope of the project, the range of stakeholder involvemnt including planning from the start of the project and what can be done in the phase of threats to groundwater security evident from research previous findings. He indicated that the groundwater2030 project will ensure that these concerns are incorporated in the implementation of the project as much as possible.

3.3 Session 3: The Plenary-Stakeholder Discussion and Feedback

The session was jointly moderated by **Dr. Raburu and Dr. Hayombe**. The duo engaged stakeholders in discussions during the plenary session which among others , revealed key concerns of residents of informal settlements in being left out of planning and decision making by the urban authorities. Dr. Raburu challenged the stakeholders to explore innovative ways of project implementation. The plenary was structured into thematic questions as follows to get the stakeholders views:

i. Who else would be included in the project?

Participants were asked to think of other agencies that would be involved in the Groundwater2030 Project. The following were identified;

- ***State Actors:*** Water Resource Management Authority (WRRMA) as a regulator agency, National Environment Management Authority (NEMA) an enforcer and a regulator, Lake Basin Development Authority (LBDA) as a participant in the water sector, County Government as custodians of the city.

- ***Non State actors:*** Water Users Associations, Well owners, Practical Action, SANA International, Kisumu Wash Programme, World Vision, Care Kenya, Cordaid and the local community.

ii. How can the project be made better?

Accommodating the Masters and PhD students as researchers, involving the community through their user groups/associations, involving the community to participate in monitoring (Community protocol), and connecting disease prevalence with water quality and contamination as a sensitization strategy.

iii. How can the project communicate to you?

This question was to address the concern of disseminating study findings to the stakeholders. Organizing workshops to pass information, involving schools; both primary and secondary schools and using pupils/students as communication channels, use government institutions such as Public Health as an institution for enforceability and regulation and simplify information dissemination by converting technical reports into simple information that can be consumed by ordinary people.

iv. How can the data generated be used?

County government for planning, academia as reference material, key consumers use it through information sharing and investors for decision making to guide in weighing

for options, well owners for improvent of well conditions and the water quality for the safety of users. Water users for processing of groundwater for multiple uses.

v. How can the information generated be communicated?

The identified channels of communication would be: target celebrations and national days, days for exhibitions such as World water day, World wetlands day or World environment day. Through schools programmes where students are engaged in essay competion writing or poems within the project area and through use of banners and posters at strategic locations preferably in the proximity of relevant Wells.

vi. What are the other Initiatives going on in the City?

Kisumu monthly clean-up: Every first Saturday of the Month, an initiative by county government (Environment) and SANA International is the secretariat, Project Studies such as Kenya Informal Settlement Improvement Programme (KISIP)-Ministry of Housing and Kisumu Urban Project, Kisumu Wash Network working on water and sanitation issues in Kisumu County, VIRED International is working on Catalysing self-sustaining sanitation chains in informal settlements of Kisumu City. The NGO Practical Action were also engaged in a study of groundwater sources in the Kisumu area.

vii. What are the big issues?

The identified issues were:

- Kisumu is a big city, the data generated should be fed into the regional outlook.
- Research studies that are carried out are not yielding much towards providing sustainable solutions to groundwater securiy.
- The challenge of coming up with a database that is centralized for ease of access by others
- Incorporating the water vendors in the research,
- Legal, policy and pricing issues that have not be institutionalized by the regulatory bodies.
- Research information generated does not influence policy and practice.
- Using an integrated approach to water resource management for both underground and surface water.
- Lack of equipment for use in water issues.
- Capacity building on water issues.
- The research findings on ground water should be used strengthen and model own source water needs safety challenges to the year 2030 and beyond,
- Lack of information on the sources/recharge of ground water in Kisumu.
- The challenge of urbanization and climate change in relation to availability of groundwater and stability in groundwater tables.

- As the city expands with more people, the first option of water is the well.
- The manner in which the hospital waste is disposed.
- Pollution of underground water sources by the city dumpsites, Pit latrines and related sanitation practices.
- Sustainability issues by the young County Government on the most viable way of managing water.

viii. What other key activities can be undertaken?

The key activities would include:

- Waste management activities because they are the main contaminants.
- The national government to upscale preservation of water towers and catchments.
- Conservation of recharge areas such as Kisat River in Kisumu.
- Socio-economic empowerment of the local community through income generating activities.
- Identify and map all the recharge areas in Kisumu.
- Continuous community sensitization, water quality monitoring and quality assurance on the quality of water that is being consumed.
- Adequate budgetary allocation to support the roll out of the planned activities.
- Harmonize water supply and sanitation infrastructure to realize health benefits.
- Innovative technologies and strategies that mitigate the effects of pollutants / contaminants and develop multiple alternatives for water supply

4.0 Workshop Closing ceremony

4.1 Way Forward

Dr. Jim Wright gave key issues of concern that the research project would consider to meet stakeholder needs as follows:

- Participants indicated that they would like technical reports to be communicated to the ordinary people using non-technical language to the benefit of all. To meet this need, the data collected in the project will be processed, made useful and accessible to the local people/stakeholders.
- The spatial scope of the project in future and when possible will be expanded to include other parts of the city, besides Migosi and Manyatta.
- Water users associations to be involved in planning, monitoring and utilization of underground water.
- The study will have to step down the research to some practical actionable activities for the benefit of the community.

- Involvement of stakeholders in the preparation of the follow on project will be critical to ownership, relevance and sustainability.
- Stakeholders were unanimous that the project is timely, desirable and have their full support.

4.2 Closing Remarks -Prof: Barrack Abonyo

Professor Abonyo, the Cabinet Secretary in charge of the Water sector in the County Government of Kisumu, stressed on water being of key importance to the livelihood of the people of Kisumu. Therefore water pollution is of serious concern and its impact is significant on the lives of the people of Kisumu. To solve the acute water problems in Kisumu, there is need to tap into the local knowledge and resources within the county, even as we welcome the support of external aid.

Within Kisumu County, there are many water systems- Government systems, Private systems, Non Governmental Organizations, Research institutions which need a joint approach to solving challenges in the water sector. He challenged the participants to get involved in the preparation process of the Kisumu County Integrated Development Plan (CIDP), as a framework for coordinated action. That as key stakeholders in the water sector, if they carried out activities in isolation they were bound to duplicate activities and result in wastage of resources. He added that there was need to restructure the water systems in the county by registering all NGOs, research institutions and organizations and then prepare briefs on their operations. The county government has some little funding that it could use to support such initiatives.

As a research team, he reiterated on the need of using an integrated approach towards water resource management to support county government efforts. The county government that is mandated to manage water does not have enough resource to invest in water and cannot succeed without this kind of support.

He emphasized the need to translate the findings of the research that will be conducted into action for benefit of the local community. Additionally the participants should write proposals for funding in the water sector and implement the programmes quickly.

Annexes

Annex 1: The Workshop in Pictures

Annex 2: Workshop Programme

GROUNDWATER 2030 STARTUP STAKEHOLDER'S WORKSHOP PROGRAM- 13TH SEPTEMBER 2013 AT KISUMU HOTEL

TIME	ACTIVITY	RESPONSIBILITY
8.30.00-9.00am	Registration of participants	Tom Otieno, Dan Abuto, and Isaac Nyaweno
9.00-9.30am	Welcome and Introduction of Participants	Mr. J. Okotto-Okotto
9.30-10.00	Official Opening by **Prof. Steven Agong** VC Jaramogi Oginga Odinga University of Science and technology	Prof. Okeyo Owuor
10.00-10.30	Groundwater Situation in Kisumu City; by **David Mutai (WARMA-LVSCA)**	
10.30-11.00am	**TEA BREAK**	**Tom and Dan**
11.00am-11.30 am	A glimpse into Previous Groundwater Study in Kisumu by; **Dr. Steve Pedley**	Dr. Lorna G. Okotto and Dr. Steve peddley
11.30-1.00pm	The Groundwater2030 project; by **Dr. Jim Wright**	
	Discussions and section wrap up	
1.00-2.00pm	**LUNCH**	**Tom and Dan**
2.00 -2.30pm	Stakeholder involvement	Dr. Jim Wright and Dr. Philip Raburu
2.30 -3.30pm	Feedback and Plenary Discussion	Dr. Patrick Hayombe
3.30-4.00pm	Way forward	Dr. Jim Wright
4.30- 5.00pm	Closing by **Prof. Barrack Abonyo** Minister Water, Energy and Natural Resource- Kisumu County	Prof. Okeyo Owuor
5.00pm	Wrap up and Vote of thanks	Dr. Lorna Grace Okotto/Philip Raburu
5.00pm	TEA BREAK	Tom Otieno, Dan Abuto
	Participants depart at their own leisure	All

Raportuers:

1. Mrs Naomi Apali
2. Mr. Michael Wayumba
3. Jared Okungu

Annex 3: List of Participants