



# **ORASECOM GROUNDWATER MANAGEMENT POST-TRAINING EVALUATION**

**By AGWNET, May 2014, Johannesburg**

## **INTRODUCTION**

The Orange-Senqu River basin, with a total area of 896,368 km<sup>2</sup> and population of over 19 Million, is located in Southern Africa that covers Republic of Botswana, Kingdom of Lesotho, Republic of Namibia and Republic of South Africa where groundwater resource has vital role for rural water supply (domestic, livestock and irrigation uses) besides as a source for mining and tourism in the riparian countries. Due to benevolent gesture of the riparian countries to meet the growing water demand and foster the interaction between countries on water resource issues, ORASECOM (Orange-Senqu river commission) was officially established in Nov. 2000.

### **Motivation for the training**

Inclusion of transboundary groundwater management as a mandate of the Lakes and River Basin Organizations (L/RBOs) has been recognized by the African Ministerial Council on Water (AMCOW) in 2007 and later adopted by the Southern Africa Development Community (SADC), and African Network of Basin Organisations (ANBO). Due to the absence of any such activity by the L/RBO's, BGR approached AGWNET to perform a needs assessment, which documented the lack of groundwater management at L/RBO scale. The follow-up consultative meeting held in Burkina Faso in Feb. 2013 that involved 7 L/RBO's and 1 Aquifer organization has identified the necessity of delivering "Groundwater Management" training at Lake/River basin scale in order to enhance the capacity and facilitate the integration process. Accordingly, ORASECOM has shown an interest to host a pilot training and, therefore, necessary preparations were started in May 2013 and the training was delivered in Sept, 2013 at Wits University, Johannesburg. Twenty four participants from six countries have been selected for the training and were accommodated at the Protea Hotel Parktonian, Johannesburg.

## CURRENT ACTIVITY

AGWNET has conducted a post training assessment on the ORASECOM Groundwater management training was held between 23<sup>rd</sup> and 27<sup>th</sup> Sept, 2013, Johannesburg. The training was organized and sponsored by CAPNET/UNDP, BGR, IWMI, AGWNET, IGRAC, IFAD and imawesa. The training targeted officially nominated participants from Botswana, Lesotho, Namibia and South Africa (20). However, CAPNET has additionally supported three participants from Lesotho, Mozambique and Zimbabwe. In order to facilitate the activities of the ORASECOM HQ, the organizers granted permission to one participant. Out of 23 participants from six countries who have direct role in the river basin activities, 16 have responded to the questionnaire which amounts to 69.6% of the respondents.

## SECTION 1: QUESTIONNAIRE

The questionnaire was prepared based on the CAPNET-MELP guideline and some relevant questions were added based on experience.

Dear ORASECOM training participants:

*You participated in the training course on the “**integration Of Groundwater Management Into African Basin Organisations Orange-Senqu River Commission (ORASECOM) from 23 to 27 Sept. 2013 in Johannesburg**”.*

*Will you please take a few moments to answer the following questions? This will help us to improve our work.*

- Q1. How have you used the knowledge from the course to improve your own performance at work?***
- Q2. How have you shared the knowledge from the course to improve the performance of your organization?***
- Q3. How have you spread the knowledge from the course to other people and institutions?***
- Q4. Could you mention examples of concrete actions which were or will be undertaken as a consequence of the training course (e.g. implementation of specific policies or programmes, influence on groundwater related decisions locally or nationally, cooperation with other stakeholders, use of the learning materials for other staff/colleagues, young professionals or students etc.)?***
- Q5. Are you able to use your knowledge or influence to bring groundwater on the political agenda for decision-making? And if so how? If you have NOT been able to***

*use the training to improve your role or organization as hoped, then what specific institutional challenges prevented that?*

**Q6. Other comments? Please make suggestions for follow up activities/actions or improvements?**

**Q7. Would you agree to answer further questions as a follow up to help improve the impact of the trainings:**

**Note: Section 3 presents the key summaries extracted from Section 2.**

## SECTION 2: RESPONSES FROM PARTICIPANTS

(SEQUENCE AS PER IN TABLE 1):

### Question 1

How have you used the knowledge from the course to improve your own performance at work?

#### Responses:

- 1) Let me take this opportunity to thank the rest of the ORASECOM team for the professional facilitation of the training. The knowledge I got from this training is immeasurable in the sense that firstly, as a groundwater professional I was not well informed regarding the transboundary aquifers and the information I gathered has definitely improved on my water resources management skills. Now that I'm directly involved in the National Water Apportionment, I am contributing positively to issues of granting Water Licences especially the Marico/Limpopo shared river course by implementing the principles of ORASECOM and other river commissions. I have really gained a lot from this training and also trainings of this nature, the list is endless.
- 2) Yes the course was an eye opener to me and made me understand groundwater management better.
- 3) I have tried to put groundwater irrigation in the planning of irrigation schemes in my province, this includes collection of data and creating a database for all farmers using groundwater for irrigation purposes.
- 4) According some examples given in the training material (power and files) about GW protection, I took some example for interpretation or understanding how to solve specific problems.
- 5) The Knowledge gained from the training course has helped my organization to do its work better on spreading education on Water Stewardship. Out of the four known outcomes of Water Stewardship being: (1) good water governance, (2) sustainable water balance, (3) good water quality status and (4) healthy status of important water related areas (IWRAs), we have chosen to start with the Good Water Quality Status as this can be achieved through education to all people to ensure their daily activities avoid pollution of water resources. The Lectures given during the course have therefore equipped us with more knowledge to do our work better even with better facts and references.

- 6) I have used the knowledge gain from the course to incorporate different stakeholders in groundwater management such as groundwater quality monitoring and compliance monitoring in to groundwater level monitoring.
- 7) The knowledge that I acquired from the course helped me with my performance at work by understanding better the importance of groundwater management and the integration of it with surface water. In my Sub-basin the increase of human activities especially agriculture, mining, urban and industrial development are rising rapidly thus causing a high risk of pollution to our water resources. So with the training course knowledge it helped me improve my engagement with all the relevant stakeholders in my Sub-basin as well as I now have a much better understanding on groundwater transboundary aquifers.
- 8) I used the knowledge gained from the training in sharpening my groundwater management practices at the Department of Water Affairs. Here I work in the Groundwater Division where my role involves assessment, management and protection of groundwater resources. Through the knowledge gained I was able to advice on the right locations to drill boreholes such that the areal water quality and quantity are not compromised. This was done by avoiding locations that area already in the vicinity of other water abstractions and areas that are in the vicinity of water pollution activities as this tends to increase the movement of groundwater such that pollution spreads further. There is a particular case in the Southern district of Lesotho called Mafeteng where there were many applicants for boreholes drilling. My office realised that if all those people have boreholes in their yards, they are going to dewater the aquifer and was advised to have a single well-managed borehole that feeds the people in that area. It was, however, realised during site visit that the yards are not so close that they can have adverse impacts on each other and were therefore all given permits. Even though they eventually got individual boreholes, the decision was made because of the knowledge gained from the training. I have also worked in an IWRM SADC funded project where the main objective was to use water beyond mere domestic use. This involved engaging many stakeholders from Ministry of Agriculture, Trade, Local Government, Statistics, Chieftaincy, Rural Water Supply, Water Affairs, Forestry and land reclamation etc. the approach was highly supported by the information gained from the training.
- 9) We have seen the gaps in groundwater data, national Water legislation which have not adequately addressed issues of groundwater and involvement of all stakeholders in groundwater issues. The inadequately informed legislation weakens the management of the resource and promotes more concentration on the surface water
- 10) We have seen the gaps in groundwater data, national Water legislation which have not adequately addressed issues of groundwater and involvement of all stakeholders in groundwater issues. The inadequately informed legislation weakens the management of the resource and promotes more concentration on the surface water

- 11) We have seen the gaps in groundwater data, national Water legislation which have not adequately addressed issues of groundwater and involvement of all stakeholders in groundwater issues. The inadequately informed legislation weakens the management of the resource and promotes more concentration on the surface water
- 12) The knowledge I got from the course did help in the understanding of the need for transboundary monitoring although we are yet to do it on northern side of the country, we share the same aquifer with Zimbabwe (Maitengwe Well field.) As a SADC initiative were supposed to have started this project but could not go on as planned due to some logistical issues between the two countries.
- 13) As a groundwater technician you come across different types of pollution, with his presentation it gave me the better understanding on the measures we should take and to correct the previous mistakes.
- 14) Due to the lack of support from our supervisors/ managers the process is very slow
- 15) On the day to day basis the knowledge has been beneficial especially on matters of water allocation; the other important thing is data collection, monitoring and evaluation.
- 16) It has opened an understanding on transboundary groundwater resources management and the interaction between groundwater and surface water. I have also managed to treat these resources with equal importance.

## Question 2

**How have you shared the knowledge from the course to improve the performance of your organization?**

### **Responses:**

- 1) The year 2013 was a good year for training of most of the staff in the water sector in Botswana, IWRM courses were regularly organised by both Botswana and the Swedish Government to facilitate for the water sector transformations which was completed on 31<sup>st</sup> March 2013, including the opportunity to attend this ORASECOM training. Through these courses I was able to interact directly with hydrogeologist/colleagues and excitedly shared what I learned from ORASECOM (transboundary aquifers being the most exciting topic).
- 2) Yes
- 3) Following the training in RSA, I wrote a report to my superior narrating about the course and its impact to the organization's day to day functions. Soon after the report we had a meeting with all the technical staff and highlighted on the need to encompass groundwater management in irrigation agriculture. One of the important outcomes of this meeting was to create a groundwater use database for irrigation farmers and creation of a broad capacity development program in sustainable groundwater management for other staff and the farming communities.
- 4) We have now new technicians that are responsible to collect data (water levels in boreholes and in situ analyses of water quality for physical parameters) daily, also showing and shared all materials given during the training to compare and discuss how is applicable for our specific case study.
- 5) After the course I have shared the knowledge gained with members of my organization but also with different groups and institution as my organization as an NGO already involved in the Water Sanitation and Hygiene (WASH) Education with NGOs, schools, Communities and Football Clubs educating about the need for proper sanitation facilities and their use for protection of water resources as well as preventing diseases.
- 6) The knowledge gained from course in terms of groundwater monitoring have improved our Division in terms of routine work of data collection and analysing of water level data in the water basins (catchment area), especially the Stampriet transboundary aquifer. Previously these activities were conducted in political boundaries and less attention was given to the data collected. All this have changed now as we are looking at the data per water basin and interpret it as such. We are in a process of introducing equipment for real-time data, something we have seen during the course to improve our data collection.

- 7) Well so far I shared the knowledge with my stakeholders at our quarterly Forum meetings where by I gave presentations regarding water resources management specifically ground water management. This helped my Sub-basin management committee and forum to come up with our 2014/2015 work-plan activities concerning groundwater management issues in the basin. This year we will also incorporate it in our school and community awareness campaign the emphasis of groundwater and surface integration management as well as transboundary issues.
- 8) I have shared the knowledge with my groundwater survey team which is responsible for sitting of boreholes and supervised them in the best practices of locating a borehole in an area that is prone to contamination. Also making them aware that if they drill a site a borehole next to river, they should bear in mind that there could be a high connectivity between the borehole and the river system therefore the over pumping the borehole may dry up the surface water body
- 9) Yes, we have shared the knowledge gained from the course with other stakeholders and have taken cognisance of groundwater issues in the line of duty on daily basis
- 10) Yes, we have shared the knowledge gained from the course with other stakeholders and have taken cognisance of groundwater issues in the line of duty on daily basis
- 11) Yes, we have shared the knowledge gained from the course with other stakeholders and have taken cognisance of groundwater issues in the line of duty on daily basis
- 12) I have shared the knowledge to the team of Groundwater Division in some meetings as a feed back after attending the course. I also shared with other colleagues from regional offices
- 13) My work performance has improved and those that I shared with. I loaded the slides on my PC so whenever I encounter problems I read them again. I was lucky that I attended with my supervisor we discuss some of the things we learnt.
- 14) Currently I am the only one in geo-section here in Cradock Water Affairs. On our structure there is a huge vacancy of posts that are not been filled, I believe that as soon as we fill the posts we can able to apply the knowledge gained from the training course attended. I am also a member of Groundwater Technical Forum (GWTF) Meeting and Groundwater Division-Eastern Cape (GWDEC), not a lot that has been shared since the meetings were held once after the training.
- 15) I have shared the information, especially within my area of influence
- 16) I distributed the course materials to relevant individuals within the Department of Water Affairs especial the Groundwater and Hydrology Divisions.

## Question 3

**How have you spread the knowledge from the course to other people and institutions?**

### **Responses:**

- 1) Please note that this one is addressed by answers for questions 2 and 4.
- 2) I have shared the information to the basin management committee members and I am working with our forum meeting which is the platform for sharing information in the sub-basin
- 3) Yes. I have shared the valuable information from the training with the technical staff at my organization i.e. the staff responsible and those who work directly with the irrigation farmers in the field. To date I have not shared the information with other institutions.
- 4) Due the lack of GW technicians, the interaction is between others from agriculture, environmental, municipalities, water supply companies, but processes are very slow. So we are trying to form small group to analyse issues from surface and GW control at the same time.
- 5) Through a number of avenues such as Workshops that my organization organized, through Poems, songs and Drama competitions in Early Childhood Care and Development Centres (ECCD) and public gatherings which managed to organize through our members in ECCD. We have had a chance to be invited by WFP to provide WASH education to their partner organizations. My organization is also a member of the Water and Sanitation Sector Coordination Meeting (WSSC) which meets quarterly and so this is also where we have had a chance to spread the knowledge acquired at the training course.
- 6) Our Directorate consist of five Divisions, we have Geohydrology that deals with groundwater, Hydrology that deal with surface water, Water Environment that deal with water quality, Law administration that deal with licensing control and planning that oversees the projects of other division. In the past, these divisions were focusing only on their division activities but this has changed as now we plan together and also carry out field activities together such as water quality sampling which was sole responsibility of Water Environment but, now all the other Division are helping out.
- 7) So far I mostly shared the information with the Sub-basin's stakeholders who represent different institutions in the basin during our basin management committee/forum meetings, who then go back to their institutions and give feedback/report on our activities to their

colleagues. In this way the information is spread to all represented institutions. We also have a collection of information (mini library) regarding water resource management for any interested person, in this way information is shared. Before this training course we held our community and school awareness campaigns already as per our work-plan hence we couldn't share/ raise awareness on groundwater management but I will definitely spread the knowledge to the communities and schools in the sub-basin in the course of this year.

- 8) I have not had a direct opportunity to spread the knowledge to other institutions except that in different forums where an IWRM concept has to be adopted, I have been actively involved in giving ideas or direction that shows an IWRM concept.
- 9) Yes. We have spread the knowledge through reports and discussions with various stakeholders and water resources in general.
- 10) Yes. We have spread the knowledge through reports and discussions with various stakeholders and water resources in general
- 11) Yes. We have spread the knowledge through reports and discussions with various stakeholders and water resources in general
- 12) I have shared the information with a friend who is working for Soda Ash Botswana who is actually involved in the Groundwater monitoring
- 13) I shared the information and the material that I got from ORASECOM with my colleagues and graduate trainees. It is tough to come up with big projects cos they crush it at times.
- 14) I am a member of Groundwater Technical Forum (GWTF) Meeting and Groundwater Division-Eastern Cape (GWDEC). Fracking in Karoo areas is one of the topics that are on discussion in both forums. The knowledge has been shared through comments and input during the discussion of what we have learnt about hydraulic fracturing. Although the process within the department is very slow but we are trying to share the knowledge by giving inputs to what we have learnt from the training course.
- 15) During meetings both formal and informal
- 16) From September last year when the training was held up to now not much has been done but i have been to a few workshops where i shared with stakeholders the importance of trans-boundary aquifers and that we should treat both surface and groundwater resources as equal important.

## Question 4

Could you mention examples of concrete actions which were or will be undertaken as a consequence of the training course (e.g. implementation of specific policies or programmes, influence on groundwater related decisions locally or nationally, cooperation with other stakeholders, use of the learning materials for other staff/colleagues, young professionals or students etc.)?

### Responses:

- 1) I was representing Department of Water Affairs (Botswana) to cover the issues of both surface and Groundwater. Having the knowledge of the shared aquifer between Botswana and SA at Ramotswa which I gathered from this training, I was able to advise cross border bridge projects accordingly.
- 2) The basin management committee will start monitoring the groundwater use in the boreholes that were drilled by BGR for the community members in Omundaungilo area. In the action/work plan for 2014/15 the committee would like to research for possible additional freshwater boreholes and also monitor the Ohangwena 2 aquifer. This will be done with the help of the Ministry of Agriculture, Water and Forestry, BGR and other relevant key stakeholders.
- 3) There is a proposal that a capacity development program be created and implemented for all irrigation staff and farmers on the importance of integrating groundwater management in irrigation agriculture for the province. I have also proposed that we design a groundwater guide manual for farmers that is in our local language.
- 4) Along the Zambezi River Basin , we have 5 well fields that supply 3 main cities. Now with Netherlands cooperation we're in a process to establish an pilot conceptual to monitoring 1 of aquifer (Nhartanda valley) along Tete city that will reply to another monitoring systems.
- 5) My organization is a member of the WSSC which holds meetings quarterly and this is where I have the opportunity to push for the implementation of the very first Statement of the Lesotho Water and Sanitation Policy on Water Resources Management. My organization has acquired funding to hold Workshops for Decision Makers to raise awareness on the need to mainstream Water Resources Management in their respective Ministries as water is essential and is used by everybody hence the need to ensure it is well managed while executing our daily activities. We have therefore requested the Commission of Water (COW) that houses the Water and Sanitation Policy to assist invite these high level officials but also for COW to be involved to take ownership afterwards. Though not a

consequence of the course but as initiative of the Government of Lesotho having seen the pollution of water, on behalf of the Water and Sewerage Company Lesotho (WASCO), my organization is implementing the Maseru Waste Water Project – Works 1 (MWWP-W1) which will construct about 3100 sanitation facilities and rehabilitate some in the Maseru City Council from January 20, 2014 till January 16, 2016. This will also include Community Mobilization and Hygiene Education as a way to educate people on the need to dispose waste in a way that it does not pollute the scarce and shared resource, water. TED has scheduled trainings for different Areas where the World Food Programme is working in the districts of Berea and Mokhotlong in which different Ministries and NGOs meet to be trained of WASH. Through Football Stars, there are preparations made to celebrate the World Toilet Day with football tournaments in which football stars will pass the WASH education to stop open defecation that often pollutes water and to advocate or properly constructed sanitation facilities that do not contaminate underground water. TED has a series of Workshops going on in all districts through the EU funded School Sanitation Project in which different stakeholders are invited to take ownership of the project for its sustainability. In these workshops stakeholders are sensitized on the need to take care of water resources. TED works a lot with students in their Schools' Environment Clubs and so a lot of students in the schools where we go benefit a lot from the material of the course but all have to be simplified to the level of the students we work with at their different levels.

- 6) After the course we have embarked on developing a national groundwater strategy for the country. We are currently developing the Terms of Reference for the strategy. This will help the entire stakeholder in managing, planning and utilizing the groundwater.
- 7) As for now, no major concrete actions were taken as a consequence of the training course except the sharing of groundwater information. And also firstly making all people aware of how important is our groundwater resource. Now that our new Water Resource Management Act of 2013 is enacted we will be able to implement the act fully regarding our water resources.
- 8) None
- 9) We have informed the authorities and expects changes in the way groundwater is being managed in the county.( For example, the review of the Policy and Water Act to include the groundwater issues adequately)
- 10) We have informed the authorities and expects changes in the way groundwater is being managed in the county.( For example, the review of the Policy and Water Act to include the groundwater issues adequately)
- 11) We have informed the authorities and expects changes in the way groundwater is being managed in the county.( For example, the review of the Policy and Water Act to include the groundwater issues adequately)

- 12) We are awaiting approval of some policies that would support the protections designated well fields. Currently everything is done as just guidelines with no policy in place to enforce
- 13) At work I am a junior staff the only people I share the information with are my colleagues. At the present moments I don't have the project that involves stakeholders. the project that I'm busy with its to check the recharge rate by checking the rain gauges and the boreholes.
- 14) Here in Eastern Cape there is a new Coal Mine at Elitheni (Indwe) that has been opened recently, but for now the operation has been stopped due to the rehabilitation of the mine. We as the Department of Water Affairs stakeholder are giving inputs about how to prevent pollution and how to monitor Surface and groundwater pollution. Assisting especial on siting of new monitoring points both surface and groundwater.
- 15) There is no specific programme as the department is going through a restructuring process
- 16) As stated during the training that SADC had initially wanted to put monitoring equipment in an aquifer that is shared by Botswana and Zimbabwe but the project was suspended. With the training gained and insight on the importance of data sharing between two states sharing an aquifer we have started to follow up and find out how the project can be continued for the benefit of the two countries.

## Question 5

**Are you able to use your knowledge or influence to bring groundwater on the political agenda for decision-making? And if so how? If you have NOT been able to use the training to improve your role or organization as hoped, then what specific institutional challenges prevented that?**

### **Responses:**

- 1) In Botswana decision making has always been science based except in minor cases where some developments like the construction of landfills did not initially consult the groundwater expertise, the situation is currently rare. Given the current awareness level, the situation has reasonably improved and every aspect is taken seriously. As a hydrogeologist and representing the Water Sector I am capable of influencing such decisions which are likely to temper with water resources either positively or negatively given the knowhow I have before and after the training.
- 2) I am able to use the knowledge but this have to go through the right channels of communications. As we have regional councillors in the committee, it will be best to start involving them so that they understand the concept of groundwater management
- 3) *Yes I have used the information to improve my role in the organization. However, the groundwater issue has not been taken seriously in my country. There are also no clear policies on groundwater use and management. Most people are concerned with surface water and do not see the potential that lies in the ground. There is therefore great need for vigorous awareness to the populace on the potential of groundwater especially in mitigating climate change and for agricultural benefits.*
- 4) In Mozambique we are in process to upgrade the hydrogeological national map and during the process, also the development of coal company mines, to give an example like the environmental problem occurred in gold mines of Wits and government is commitment to avoid.
- 5) YES, through engaging decision makers to talk and understand the importance of Water Resource Management especially when it appears in the Lesotho Water and Sanitation Policy.
- 6) I was part of the team that drafted recommendations to our Under-Secretary regarding Water as whole sector being in the same ministry with Agriculture. This has not benefited us in any sense as more attention is given to food security and water is put aside until last year when we faced drought, that's when the cabinet reacted and instructed us to drill more

boreholes for water supply to the communities and this has affected our core mandate of managing water resources. The recommendation was to separate water from agriculture. Whether the politician will react on to separate the two sectors or we will remain the same it's something we have to wait and see. This situation had impacted us so much as we could not control any groundwater use as more boreholes were drilled throughout the country.

- 7) *Yes, as a Basin Support Officer, I and my sub-basin management executive committee we can have an influence when it comes to giving water abstraction permits, I will be able to use the knowledge I acquired to give recommendations when it comes to the process of approving for water abstraction permits in our sub-basin areas and also be able to do groundwater monitoring as at the moment the monitoring is done by staff people from the Ministry's head office in Windhoek.*
- 8) Groundwater in my opinion is already in the political agenda in Lesotho and my contribution in the past has been in the participation of the approval of the environmental impact assessment for development activities. As a stakeholder institution we receive and comment on the developments that may have an effect on the groundwater quality or quantity.
- 9) Yes. By sharing the information with the decision – makers through Water Sector Coordination Meetings and other water sector fora. The intention is to share the information with Parliamentary Portfolio Committee on Natural Resources as well. The State of Water Resources Report which is produced every year and shared with all stakeholders will also be enhanced on groundwater issues and shared with the same Parliament Portfolio Committee for more political buy in.
- 10) Yes. By sharing the information with the decision – makers through Water Sector Coordination Meetings and other water sector fora. The intention is to share the information with Parliamentary Portfolio Committee on Natural Resources as well. The State of Water Resources Report which is produced every year and shared with all stakeholders will also be enhanced on groundwater issues and shared with the same Parliament Portfolio Committee for more political buy in.
- 11) Yes. By sharing the information with the decision – makers through Water Sector Coordination Meetings and other water sector fora. The intention is to share the information with Parliamentary Portfolio Committee on Natural Resources as well. The State of Water Resources Report which is produced every year and shared with all stakeholders will also be enhanced on groundwater issues and shared with the same Parliament Portfolio Committee for more political buy in.
- 12) *Yes we make recommendations as regards allocation of water points in designated well field areas. But we still face a challenge of political influence at times*

- 13) As a junior staff it's not easy to influence top managers because we do not attend meetings where they take such decision, we only share such information with the next supervisor and colleagues.
- 14) Not yet, the challenges at this point are lack of support from our managers and shortage of staff from our section.
- 15) Not yet, I am hopeful that with my new assignment as a Regional Water Resources Manager I will get the opportunity to do so.
- 16) People have a tendency of only to believe what they can see, and this is the case with most political leaders. Political leaders prefer to promote surface water at the expense of groundwater because they can see it however we making progress as a department in showing them that both surface and groundwater are important for economic growth and the livelihood of the people.

## Question 6

Other comments? Please make suggestions for follow up activities/actions or improvements?

Responses:

- 1) Regarding the follow-up activities, I suggest that the current professional capacity of ORASECOM be exploited for the further/detailed assessment of first, both the Ramotswa and Stampriet transboundary aquifers and eventually the drilling of boreholes for pumping. I am suggesting this because the core water sources for the Southern Botswana (being Gaborone, Molatedi in SA and Bokaa dams) have this year registered poor performance that we have started seriously fearing for the future, also considering climate change. Of course we have reliable sources up north which have collected enough water this year, yet it is expensive to transport water to the south (up the gradient) compared to the possible pumping from boreholes in these aquifers which remain unexploited. In this case, ORASECOM should consider extending their helping hand to supporting the national groundwater development projects in Botswana. In addition, I have highly rated the training and recommend that ORASECOM should revive arrangements of this nature as it will truly impact positively on the water resource management issues. One more thing that is very important, the platform we had of international professionals coming together is very important for the future development for this region and as such I'm campaigning that ORASECOM should avail further studies opportunities (masters degree in water resource management) for people like me.
- 2) The trainings of this nature are very crucial for people in the water sector to be able to understand how to manage groundwater with other water sources because in most cases people talk more about surface water but not groundwater management
- 3) Resources (i.e. information/books/etc) on how best we can lobby for groundwater management issues both locally and nationally. How best to address the groundwater issues in irrigation agriculture, Policies concerning groundwater, Further groundwater trainings
- 4) The training was very important and it will good to continue with this programme focus on more practical case studies directly on field.
- 5) It must be agreed at the training with each country participants that they produce updates of how they have put the knowledge gained into use to push for implementation of the water resources management in their country. Best is to agree right at the training how each

- country will work as a team as coming back people do not easily meet but if they know that they already have tasks then it will be easier to get something from all members.
- 6) A practical course on the proposed project of the Kalahari-Karoo/ Stampriet aquifer by UNESCO to conduct a detailed assessment of the characteristic, current state and management of the transboundary aquifer. I would suggest that a training course can be organised where the participants can do a field trip to see and understand different activities conducted by the three different countries in terms of groundwater management. This can help the countries to harmonise groundwater management, example groundwater monitoring.
  - 7) I think it will be ideal to have a follow up workshop, where participants can present and show what they have been doing in their respective countries regarding groundwater management since the training.
  - 8) None
  - 9) Follow-up on progress on the implementation of mainstreaming groundwater management in the development agenda.
  - 10) Follow-up on progress on the implementation of mainstreaming groundwater management in the development agenda.
  - 11) Follow-up on progress on the implementation of mainstreaming groundwater management in the development agenda.
  - 12) The training was very important to me and to a greater extent to the department. Understanding the relationship of surface water to groundwater as the two cannot be treated in isolation. I would like to see this programme continued to another level with focus on more practical case studies
  - 13) The course was a great help to improve our work performance but I think ORASECOM need to have top management's workshop. I also think the workshop should be two weeks, the information you gave us was indeed important. After the workshop please involve us in such projects as that will open our managers' eyes. I would like to learn more on fracking actually if there are any courses on it please inform me on it.
  - 14) The training was very successful
  - 15) No at the moment
  - 16) A two day follow up workshop to realise and discuss what has been achieved so far by the states collectively in managing the resources.

## Question 7

Would you agree to answer further questions as a follow up to help improve the impact of the trainings:

### Responses:

- 1) Yes
- 2) Yes
- 3) Yes
- 4) Yes
- 5) Yes
- 6) Yes
- 7) Yes
- 8) Yes
- 9) Yes
- 10) Yes
- 11) Yes
- 12) Yes
- 13) Yes
- 14) Yes
- 15) Yes
- 16) Yes

## SECTION 3: KEY SUMMARIES

**Q1. How have you used the knowledge from the course to improve your own performance at work?**

- *Contribute to the issues of granting water licenses in shared basins.*
- *Improving groundwater management aspect which was non-existent in different sectors.*
- *Introducing groundwater for irrigation in the planning process of irrigation schemes.*
- *Apply the knowledge how to solve specific community problems regarding groundwater.*
- *Do better work in spreading education on water stewardship.*
- *Educating all basin stakeholders to ensure their daily activities and avoid groundwater pollution.*
- *The knowledge helped to incorporate different stakeholders in groundwater management aspects (monitoring, compliance).*
- *Improved level of engagement with different stakeholders.*
- *Advise borehole location away from pollution sources.*
- *Improved water licensing criteria.*
- *Helped to identify gaps in groundwater management such as database, pollution control and monitoring.*
- *Helped for the need to coordinate monitoring of transboundary aquifers which did not exist before this training.*
- *Assisted in groundwater data collection, monitoring and evaluation.*
- *Understood the need for the management of transboundary aquifer.*

**Q2. How have you shared the knowledge from the course to improve the performance of your organization?**

- *Interacting directly with the hydrogeologists, through expert meetings.*
- *Reporting to supervisors, meeting with technical staff help to agree on creating groundwater use database for irrigation.*
- *Stakeholders forum and NGOs involved in WASH activities need for proper sanitation.*
- *Direct participation in routine groundwater data collection.*
- *At quarterly forum meeting which helped to develop 2014/15 groundwater management plan.*
- *Direct communication with colleagues to avoid reckless borehole location.*

- *Distributed the course material.*

**Q3. How have you spread the knowledge from the course to other people and institutions?**

- *Emails, forum meetings.*
- *Sharing power points.*
- *Workshops.*
- *Through Poems, Songs, Drama competition.*
- *Public gatherings.*
- *Quarterly meeting.*
- *During basin management committee meeting.*
- *Groundwater management information storage in a mini Library.*
- *Through technical committee forums.*
- *During both formal and informal meetings.*

**Q4. Could you mention examples of concrete actions which were or will be undertaken as a consequence of the training course (e.g. implementation of specific policies or programmes, influence on groundwater related decisions locally or nationally, cooperation with other stakeholders, use of the learning materials for other staff/colleagues, young professionals or students etc.)?**

- *Different divisions that deal with groundwater to plan and implement together.*
- *Advising cross boarder projects.*
- *Start groundwater monitoring.*
- *Create capacity development program and train irrigation staff on the importance of groundwater.*
- *Establish a well field monitoring site.*
- *Strict control on water license.*
- *Workshop with decision makers.*
- *Community mobilization and hygiene education to reduce groundwater pollution.*
- *Stakeholder sensitization on the need to curb groundwater pollution.*
- *Develop a ToR to prepare groundwater strategy.*
- *Suggested the importance of policy review to include groundwater management.*
- *Start discussion with the neighbouring country on common interest on transboundary aquifer.*
- *Assist private sector in pollution control program.*
- *Initiated groundwater monitoring program on transboundary aquifer.*

**Q5. Are you able to use your knowledge or influence to bring groundwater on the political agenda for decision-making? And if so how? If you have NOT been able to use the training to improve your role or organization as hoped, then what specific institutional challenges prevented that?**

- *Influence projects that require groundwater to establish background values and monitor water quality.*
- *Assisting decision making bodies to consider the role of groundwater for community development.*
- *Help to upgrade the existing hydrogeological maps.*
- *Engaging the decision makers to understand WRM in the water and sanitation policy.*
- *Think for institutional separation of water and agriculture so that groundwater will be managed properly.*
- *Enhanced the effort in giving groundwater abstraction rights.*
- *Give knowledge based communication on policy related matters.*
- *Share info with decision makers through water sector coordination meeting.*
- *There is a future potential to influence.*

#### **Obstacle**

- *Political influence*
- *Lack of direct access to managers*
- *Lack of support from line managers*

**Q6. Other comments? Please make suggestions for follow up activities/actions or improvements?**

- *The current professional capacity of ORASECOM has to be exploited for transboundary aquifers assessment.*
- *ORASECOM has to extend support for the national groundwater development projects.*
- *ORASECOM should avail further opportunities (MSc) in water resources management and constant trainings.*
- *Provide resources (books, info etc..) on how best to lobby for groundwater management.*
- *Good to continue with the training program and focus on practical case studies.*
- *It is good to commonly agree how each country will work together.*

- *Field trips has to be organized to visit ORASECOM countries and give the training in two weeks.*
- *Follow up workshop on the progress and implementation*
- *Provide the training at higher level and more practical case studies*
- *ORASECOM need to have top managers workshop.*

*Q7. Would you agree to answer further questions as a follow up to help improve the impact of the trainings:*

All respondents show willingness to take part in the follow up survey.

## **SECTION 4: CONCLUSION**

The responses indicate that participants have emphasized the importance of the training in the day-to-day activities. Most respondents agree that they have identified the gap in groundwater management in their respective countries and embarked on the policy change, preparation of groundwater strategies, institutional separation for water management and stakeholder engagement. The majority of respondents have indicated that the training materials and knowledge were instrumental in their workplace and shared with working colleagues and other stakeholders. They used different forums to convey the training results such as through emails, forum meetings, poems-song-drama competition, public gatherings and meetings.

Some practical activities conducted after the training include coordination of different Departments to plan and implement together, start monitoring activities, advise private sector on pollution control, strengthening water licensing processes, workshops for stakeholders and interaction with neighbouring countries on transboundary aquifer monitoring.

All respondents indicated that ORASECOM has to support of member states for the successful implementation of transboundary aquifer management through continuous and tailored trainings and experience exchange.



## SECTION 5: LIST OF RESPONDENTS (TABLE 1)

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\* group response



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This survey was coordinated by Prof. Tamiru Abiye, AGWNET manager