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Groundwater Resources Governance in

Transboundary Aquifers

Kalahari-Karoo/Stampriet Aquifer

REPORT

THIRD REGIONAL MEETING - TECHNICAL MEETING ON PROJECT IMPLEMENTATION

Pretoria, South Africa

20-22 October 2014

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[1] Mr Lenstwe, Botswana hydrogeology specialist could not attend the meeting. Mr Kenabatho, Botswana CFP, presented results on behalf of Mr Lentswe.

LIST OF ABBREVIATIONS

CFP	**Country Focal Point**
CGS	**Council for Geoscience**
DWAF	**Department of Water Affairs and Forestry, Namibia**
DWS	**Department of Water and Sanitation, South Africa**
GEF	**Global Environment Facility**
GGRETA	**Groundwater Resources Governance in Transboundary Aquifers**
IGRAC	**International Groundwater Resources Assessment Centre (UNESCO category 2 centre)**
ISARM	**Internationally Shared Aquifer Resources Management Programme of UNESCO and IAH**
NTTG	**National Technical Transboundary Aquifer Group**
PCCP	**From Potential Conflict to Cooperation Potential**
RPC	**Regional Project Coordinator**
SDC	**Swiss Agency for Development and Cooperation**
TBA	**Transboundary Aquifer**
TDS	**Total Dissolved Solids**
TWAP	**Transboundary Waters Assessment Programme**
UNESCO-IHP	**United Nations Educational, Scientific and Cultural Organization International Hydrological Programme**
UNGA	**United Nations General Assembly**
WRC	**Water Research Commission**
WWAP	**World Water Assessment Programme**

1. Introduction

Within the framework of the "Groundwater Resources Governance in Transboundary Aquifers" (GGRETA), funded by the Swiss Agency for Development and Cooperation (SDC), the Governments of Botswana, Namibia and South Africa, jointly with the UNESCO International Hydrological Programme (UNESCO-IHP) and the International Groundwater Resources Assessment Centre (IGRAC) organized a technical meeting from 20-22 October 2014 on the assessment of the Stampriet transboundary aquifer at the Water Research Commission (WRC) in Pretoria, South Africa. The GGRETA project - Stampriet Case Study aims at improving knowledge on the recognition and vulnerability of the Stampriet transboundary aquifer (Botswana, Namibia and South Africa), developing shared aquifer management tools, and initiating the development of Multi Country Consultative Body to agree on priority areas for action to improve the management of the Stampriet transboundary aquifer. At the First Regional Meeting organized in October 2013, national, regional and international experts representing a variety of stakeholder groups worked together to set the technical bases for starting the multidisciplinary assessment of the aquifer. A Second Technical Meeting was held in May 2014 and aimed on instructing and bringing into operation the national technical groups who will lead the assessment. A follow-up mission to Botswana, Namibia and South Africa was undertaken by UNESCO-IHP experts (Mr Ross and Mr Carvalho Resende) and the Regional Project Coordinator – RPC (Mr Kirchner) in August 2014. The aim of the mission was to review data collected and processed since the Second Technical Regional Meeting (May 2014) by the three National Technical Transboundary Groups (NTTGs) engaged in the project, to discuss harmonization and analysis of data across the three countries, to carry out consultations with government authorities for the preparation of the Third Regional meeting.

2. Objectives of the Third Regional Meeting – Technical Meeting on Project Implementation

The objectives of the third meeting were:

- to provide an overview of the project, summarize progress and introduce additional elements in the project on hydro-diplomacy, gender and data harmonization;
- to report to national governments and the donor representatives on the three countries' collection and processing of hydrogeological, socioeconomic and environmental and legal and institutional data;
- to discuss the harmonization of hydrogeological, social, environmental, legal and institutional data, including priorities and presentation;
- to prepare a workplan for data harmonization and joint assessment of the Stampriet aquifer.
- to provide training and ensure that National Technical Transboundary Aquifer Group (NTTGs) have clear understanding of the UN-WWAP UNESCO gender methodology and planning.

- to provide training and ensure that NTTGs have clear understanding of Capacity and Skills Enhancement Toolkit for Hydrodiplomacy applied to transboundary aquifer management by UNESCO-PCCP (From Potential Conflict to Cooperation Potential) programme

The Agenda of the meeting is attached as Annex 1 to this report. Government representatives and experts from the three project countries attended the meeting. The List of Participants is attached as Annex 2. All PowerPoint presentations will be made available at the project website: http://groundwatercop.iwlearn.net/gefgwportfolio/ggreta

3. Summary of Main Actions, Conclusions and Decisions of the Second Regional Meeting – Technical Meeting on Project Implementation

Main actions, conclusions and decisions taken during the Third Regional Meeting – Technical Meeting on Project Implementation are as follows:

- substantial progress in the data collection and processing phase of the project (Table 1);
- integration of UN-WWAP UNESCO gender methodology;
- preparation of a work plan for gender data collection
- presentation of up-to-date legal indicators based methodology;
- commencement of Hydrodiplomacy activities applied to transboundary aquifer management by UNESCO-PCCP
- identification of hydrogeological, social, environmental, legal and institutional data harmonization priorities, issues and challenges;
- agreement on a workplan for the data harmonization and assessment phase of the project including key activities, roles and responsibilities and timelines.

Study Variable	Progress in General Key Good Progress Further work/data needed No progress so far	
HYDROGEOLOGY **A. Physiography and Climate**	Colour Indicator	Remarks
A.1. Temperature		Sufficient data collected and processing started/or expected to be smooth
A.2. Precipitation		Sufficient data collected and processing started/or expected to be smooth
A.3. Evapo-transpiration		Sufficient data collected and processing started/or expected to be smooth
A.4. Land use / land cover		Sufficient data collected and processing started/or expected to be smooth
A.5. Topography and elevation		Sufficient data collected and processing started/or expected to be smooth
A.6. Surface water network		Sufficient data collected and processing started/or expected to be smooth
B. Aquifer Geometry		
B.1. Hydrogeological map		***further data and processing needed but possible to determine***
B.2. Geo-referenced boundary of Transboundary Aquifer / Aquifer System		Sufficient data collected and processing started/or expected to be smooth
B.3. Depth of water table / piezometric surface and groundwater flow direction		Sufficient data collected and processing started/or expected to be smooth
B.4. Depth to top of aquifer formation [m]		Sufficient data collected and processing started/or expected to be smooth
B.5. Vertical thickness of the aquifer (system) including aquitards / aquicludes		***further data and processing needed but possible to determine***
B.6. Degree of confinement		Sufficient data collected and processing started/or expected to be smooth
B.7. Representative cross-sections		further data and processing still needed
C. Hydrogeological characteristics		

Study Variable	Progress in General Key Good Progress Further work/data needed No progress so far	
C.1. Aquifer recharge		recharge mechanisms generally understood
C.2. Aquifer lithology		data can be sourced from available reports
C.3. Soil types		***data available***
C.4. Porosity		***further data and processing still needed***
C.5. Transmissivity and vertical connectivity		generally understood and data available
C.6. Total groundwater volume		***could be a challenge to accurately determine***
C.7. Groundwater depletion		***further data and processing still needed***
C.8. Natural discharge mechanisms		***discharge mechanisms generally understood***
C.9. Discharge by springs		not applicable from Botswana's side
ENVIRONMENTAL AND SOCIO ECONOMIC ASPECTS **D. Environmental aspects**		
D.1. Natural groundwater quality / suitability for human consumption		Sufficient data collected and awaiting analysis
D.2. Groundwater pollution		Sufficient data collected and awaiting analysis
D.3. Solid waste and waste water control		Sufficient data collected and awaiting analysis
D.4. Shallow groundwater table and groundwater dependent ecosystems		***further data and processing still needed***
E. Socio-economic aspects		
E.1. Population Density and total population per municipality		Sufficient data collected and processing started/or expeted to be smooth
E.2. Groundwater use		***further data and processing still needed.***
E.3. Surface water use		Sufficient data collected and processing started/or expeted to be smooth

Study Variable	Progress in General	
	Key Good Progress Further work/data needed No progress so far	
E.4. Dependence of industry and agriculture on groundwater		further data and processing still needed. Specialist may need to confirm this during a visit to the study area
E.5. Percentage of population covered by public water supply		Sufficient data collected and processing started/or expeted to be smooth
E.6. Percentage of population covered by sanitation		***further data and processing still needed***
LEGAL AND INSTITUTIONAL FRAMEWORK		
Questions 1-50		There are no major issues relating to the questions under the legal and institutional framework. **However there are some data still to be collected to answer questions: 20 (on tariffs), 23(records of disputes), 24(records involving cessions), 27(sanctions), 47(a fact finding mission to be made by the specialist), 48-50(data still to be collected)**

Table 1 - Progress on data collection and processing phase of the project

4. Detailed Report of the Third Regional Meeting – Technical Meeting on Project Implementation

4.1 Day 1 (Monday, 20 October 2014)

4.1.1 Opening Session[2]

4.1.1.1 Welcome remarks from South African Ministry for Water and Sanitation represented by Ms Deborah Mochotlhi, Department of Water and Sanitation (DWS)

Ms Mochotlhi opened the session acknowledging the success of the follow-up mission undertaken by UNESCO-IHP experts and Regional Project Coordinator. She also thanked UNESCO and the Swiss Agency for Development and Cooperation (SDC). Ms Mochotlhi summarized the objectives of the project, including the improvement of knowledge of the Stampriet transboundary aquifer and the development of management tools. Ms Mochotlhi stated that South Africa, Botswana, and Namibia have signed the SADC protocol and that they have a political commitment to the protection and equitable use of the aquifer. Ms Mochotlhi stressed the importance of basing the outcomes of the project meeting on the principles of sustainability, equity and efficiency.

4.1.1.2 Welcome remarks from UNESCO-IHP represented by Mr Andrew Ross

Mr Ross thanked the South African government for hosting the meeting, and expressed his thanks to national technical teams for their efforts preparing for the meeting. He drew attention to the importance of groundwater in supplying regional and global needs for water, and to the many challenges of groundwater governance. He introduced the project design, methodology and timetable emphasizing that the project is one of the few projects on global groundwater governance, which has a leading edge component on gender specific issues and hydro-diplomacy methods.

4.1.1.3 Message from the Swiss Agency for Development and Cooperation (SDC) represented by Mr Manfred Kaufmann

Mr Kaufmann explained the objectives of SDC's Global Programme Water Initiatives which includes the prevention of water conflicts, encouragement of cooperation and water policy dialogue, and inserting

[2] Dr Obolokile Obakeng, Head of the Botswanan Delegation, experienced delays in arriving at the meeting and was unable to give opening remarks.

the gender component into the process of policy making. He stated that the GGRETA project meets all three objectives.

4.1.1.4 Message from Government of Namibia represented by Ms Aina Ileka, Department of Water Affairs and Forestry (DWAF)

Ms Aina Ileka (Namibia) stressed the importance of the Stampriet transboundary aquifer for Namibia and also the importance of sharing information and data harmonization.

4.1.2 Recap on GGRETA project main components and meeting objectives

4.1.2.1 Overview of the GGRETA Project: Objectives activities, budget, and deliverables by Mr. Andrew Ross, UNESCO - IHP

Mr Ross gave an overview of UNESCO's International Hydrological Programme (IHP) with emphasis on groundwater activities including the Internationally Shared Aquifer Resources Management Initiative (ISARM), the Global Environmental Facility (GEF) Transboundary Waters Assessment Program (TWAP) and the United Nations General Assembly (UNGA) resolution on the Law of Transboundary Aquifers. He explained how the project on Groundwater Governance in Transboundary Aquifers (GGRETA) financed by the Swiss Agency for Development and Cooperation (SDC) provides a more detailed assessment of transboundary aquifers than the TWAP. This assessment provides the basis for the development of a Multi Country Consultative Body to agree on priority areas for action to improve the management of transboundary aquifers. Mr Ross then gave an overview of the project design and activities, including data harmonization and aquifer assessment to be completed by April 2015 and the development of a proposal for a multi-country consultation mechanism by the end of 2015. He explained the project execution arrangements and presented an organizational chart of the project showing the main participants in the case study and their roles and responsibilities.

4.1.2.2 Capacity and Skills Enhancement Toolkit for Hydrodiplomacy applied to transboundary aquifer management by Mr Ralph Mahfoud, UNESCO - IHP

Mr Mahfoud provided a brief history of PCCP (from Potential Conflict to Cooperation Potential), which is an associated programme of UNESCO-IHP and the United Nations World Water Assessment Progamme (WWAP) aiming at facilitating multi-level and interdisciplinary dialogues in order to foster peace, cooperation and development related to the management of transboundary water resources. He stressed the importance of a multidisciplinary and cooperative approach in managing water. In the framework of GGRETA project, PCCP aims to develop, in a first phase of activity, a capacity and skills enhancement toolkit for hydro-diplomacy applied to transboundary aquifer management through a series of consultation with international experts and workshops the enrich the multidisciplinary

dimension. A pilot training for the Stampriet aquifer is foreseen in mid-2015 to enhance hydro-diplomacy capacities and skills that would set the basis for a series of further trainings to support the process of collaboration and governance of the aquifer. A second phase of activity could include the collection of related conflict/cooperation indicators from the three case studies of the GGRETA project (Stampriet, Trifinio and Pretashkent transboundary aquifers), with the aim of nurturing dialogue towards joint aquifer management. This would enable the analysis of favorable conditions for the potential set-up of joint management institutions and the continuation of capacity enhancement strategy by supporting hydro-diplomacy. Mr Mahfoud's presentation was followed by a discussion. In response to questions Mr Mahfoud confirmed that many stakeholders will be involved in the analyses and decision making including ORASECOM, private sector stakeholders and river basin organisations. He added that the toolkit is mainly aimed at transboundary governance, but will also be useful for national and local management.

4.1.2.3 Gender component methodology by Ms Francesca Greco, UN-WWAP

Ms Greco provided a brief history of the UN-WWAP programme activities on gender and moved on explaining how their activities will complement GGRETA project. She then introduced the questionnaire and the methodology for collecting gender specific data, especially related to the socioeconomic/environmental and legal/institutional variables focusing not only on quantitative aspects but also the qualitative dimension. She showed the coherence between gender strategies of the Swiss Development Agency (SDC) and the UN-WWAP UNESCO Gender Equality Marker (GEM) in major programmes and work plans. Proposed GGRETA activities in 2014 focus on identification of a limited number of generic indicators as well as the preparation of the detailed work program related to gender. 2015 marks the implementation of data gathering and analysis providing a snapshot of water and gender issues. Ms. Greco explained the inclusion of intensity measures for women's participation (not just "presence") in water-related institutions, as a unique effort to assess the gender component of policy implementation. She presented a series of water governance indicators including: safe drinking water, sanitation and hygiene, decision making and knowledge production, water resources management, and water for income generation in industrial and agricultural uses. Ms Greco concluded by stating that the implementation of this methodology and gender indicators would constitute a great innovation in water monitoring. Ms Greco's presentation was followed by a discussion. It was agreed that the proposed methodology was very useful. Some concerns were raised about the integration of new data collection at this advanced stage of the project, and the extra budget and time available to do fieldwork to collect the data. Ms Greco responded that collection of gender data would have to take account of funding and time available to the specialists. Specialists could focus on fact finding from existing data in order to establish a database. This additional data collection would be possible in a relatively short period of time. A strategy for further field research on the gender component and more qualitative data collection based on surveys could be examined after 2015 if funds are made available. Specialists asked to have more information on the implementation of the methodology and about resources that were available.

4.1.2.4 Data harmonization: objectives and issues by Mr Geert-Jan Nijsten

Mr Nijsten started with a recap from the previous workshop, thereby re-introducing the methodology for carrying out the multidisciplinary assessments of transboundary aquifers covering hydrogeological, socio-economic, environmental, legal and institutional aspects. He explained the project workflow and outputs including data collection (existing data), harmonization, aquifer level characterization and assessment. Mr Nijsten emphasized that the ultimate goal of having an indicator-based assessment is to simplify the output message and make it understood by the beneficiaries and the policy makers; through the simplification of technical maps into thematic maps. Mr Nijsten explained that the process of data collection was nearing its end and that the next important step to focus on is taking stock of what information and data are available and to initiate the process of data harmonization between the countries. He proposed a template for tables presenting an overview of the data assessment in the three countries for each component (sheet 12 presentations). Mr Nijsten concluded with examples where harmonization of data is needed. Of this a consensus between countries on the delineation of the transboundary aquifer is crucial, but also to agree on the wider study area to be included in the survey; this is especially important to the socio-economic component.

4.1.3 Reports on data collection and processing

4.1.3.1 Hydrogeological data presented by Ms Lydie Joel and Ms Gettie Mulokoshi (Namibia), Ms Joyce Leshomo (South Africa), and Mr Piet Kenabatho (Botswana)[3].

- *Namibia:*

The presentation of Ms Joel and Ms Mulokoshi showed the availability of the basic information concerning temperature, precipitation and land use. Concerning the geo-referenced boundary of the Stampriet Aquifer, the specialists used Google maps software to improve the delineation and to include all of the Karoo Formation inside the catchment (delimited by the Weissrand escarpment); a methodology that could potentially be followed by Botswana and the Republic of South Africa. There are still data gaps concerning the aquifer recharge, return flows from irrigation as well as the total groundwater volume. Noting that for depletion the long term water level records remain insufficient, but specialists are still working to complete them.

- *South Africa:*

Ms Joyce Leshomo stated that data was mostly available on the majority of the physiography and climate components. Information on land use and land cover has not been obtained yet but a possible

[3] Mr Lenstwe, Botswana hydrogeology specialist could not attend the meeting. Mr Kenabatho, Botswana CFP, presented results on behalf of Mr Lentswe.

source has been identified. Concerning the Aquifer's geometry, the data is available but needs to be processed so that a plot can be made. Some data is still missing including porosity, transmissivity and vertical connectivity, as well as the total groundwater volume and depletion. There is a report available for the natural discharge mechanism from which the role of evaporation and discharge to rivers and other aquifers can be deduced.

- *Botswana:*

Mr Kenabatho's presentation indicated that the majority of the data concerning the physiography and climate components is available. The estimation of the geo-referenced boundary of the Transboundary Aquifer has been improved based on the collected data on the lithology and geology of the aquifer, considering the extent of the Karoo within the catchment. Estimation of the vertical thickness of the aquifer using borehole completion records has not been possible because boreholes did not reach the bottom of the aquifer. Additional data can be collected and compiled concerning representative cross-sections and the degree of confinement. The hydrological information indicated no irrigation activity in the area and no springs. Data were collected on soil types, porosity, and transmissivity and vertical connectivity.

- *Highlights of the discussions after the presentations:*

Each of the countries has made progress in defining the aquifer boundary within the country. The boundaries of the study area across the three countries need to be mutually defined and agreed.

It is important to share the same definition of recharge of the aquifer, and horizontal flow within the aquifer. Vertical infiltration of water from surface to ground is usually defined as recharge, and the horizontal flow in the sphere of ground area can be defined as inflow and outflow. When data show absence of recharge, one should also take account of, and estimate eventual horizontal flow. It is then important to include a plot of the general horizontal flow including the "captured" water inside the aquifer. Horizontal flow estimates could be made by using isotope studies and/or or estimates of transmissivity, gradient and head. In further discussion it was argued that there is no recharge in the TransNossob region, and only intermittent recharge in the CisNossob region and the Kalahari.

Further discussions noted that data on the total groundwater volume and depletion are still incomplete and require further compilation and assessment. There is a distinction between recharge mechanisms in the Auob and the Nossob. Recharge is identified through sinkholes in the Auob and intake areas in the Nossob. It is difficult to estimate groundwater volumes because of lack of knowledge of the aquifer thickness and/or presence of the TBA (sub-aquifers) in about 50% of the area. Also the lack of data on long-term monitoring water levels impedes estimation of groundwater depletion.

4.1.3.2 Socioeconomic and environmental data presented by Mr Don Muroua (Namibia), Ms Bothepha Mosetlhi (Botswana), and Mr Bantu Hanise (South Africa)

- *Namibia:*

Mr Muroua reported that data were available on major components of groundwater water use and they are still being completed. For total population and density of population, Mr Muroua reported the presence of eight constituencies, of which only two are fully present within the aquifer. For the remaining six, an estimate needs to be made of population in the transboundary aquifer area. Some data are available on groundwater quality and wastewater. It would be interesting to present data on the suitability of water for different uses and how many people are dependent on waters that are unsuitable for human consumption. Mr Muroua discussed the challenge of gathering data on village populations, and also of presenting the data given that there are inequalities between areas. Pollution sources are kraals at boreholes (Nitrate level is rising) and secondly at villages were sewage and other waste are not safely disposed of.

- *Botswana:*

Ms Mosetlhi presented the report of socio-economic and environmental aspects of the aquifer. She explained the existence of ground water pollution risk through pit latrines, additional data from the Department of Geological Survey it to be collected. She is depending on an upcoming field visit to collect further data on solid waste and other waste water related components. It is difficult to get information in groundwater use. Discussions followed on how to infer this data from other sources, such as population and stock numbers. It is difficult to get good estimates of stock numbers, so veterinary records might be used in conjunction with estimates of carrying capacity. There is no irrigation in the study area. There is water available seasonally in pans, several months per year, which is used for livestock watering, wild life and domestic use in remote areas; but, there are no data on the quantity. There is some dependence on tourism but that could not be quantified at this stage.

- *South Africa:*

Mr Hanise explained that South Africa data is drawn from the Mier local municipality. Data has been collected on the total population, its density, and its dependence on ground water. Further information is being processed. Mr Hanise shared the difficulty in demarcating the study area although the data remain available including the gender component. Certain data such as the human dependence on ground water for domestic and agricultural water supply are incomplete. He also noted the inaccessibility of data on ecosystem dependence, on groundwater, aquifer vulnerability to pollution, and groundwater quality protection. Environmental aspects data are still incomplete but available. Mr Hanise raised the environmental problems caused by invasive species - a variable so far not included in the project methodology.

- *Highlights of the discussions after the presentations:*

The analysis of natural groundwater quality including mineral content still needs to be completed and compared with local standards of human, animal, and agricultural uses. Mr Muroua asked whether it would be possible to adapt the gender component questions to meet the relevance of the case of each of the three countries. There was some discussion about the possibility of conducting small surveys to complement data from existing sources.

4.2 Day 2 (Tuesday, 21 October 2014)

4.2.1 Reports on data collection and processing (continued)

4.2.1.1 Legal and institutional data presented by Ms Kinyaga (Namibia), Ms Mosetlhi and Mr Itumeleng (Botswana), and Ms Lebeloane (South Africa)

- *Namibia:*

Ms Kinyaga summarized Namibia's legal and institutional framework for water management using the questionnaire designed by Mr Burchi. This comprises the regional instruments including SADC protocol and the ORASECOM agreement, as well as international instruments like the Convention on the Law of Non-navigational Uses of International Waters 1997. It also includes a comprehensive framework of national instruments. Any act of drilling is subject to a government permit as water in Namibia belongs to the state. Ms Kinyaga stated the legal possibility of the implementation of Basin Management Committees drawing the attention on the involvement of the groups of farmers. Women fill 50% of management positions overall but 80% of top management are men while 83% of middle management are women.

- *Botswana:*

Ms Mosetlhi and Mr Itumeleng reported that all the relevant subsidiary legal instruments have been procured in electronic format. Based on the identified legislation, they stated that the provisions made for surface water and freshwater resources apply to groundwater. Mr Itumeleng outlined legal provisions applying to water in Botswana. Similar to Namibia, the water in Botswana is state owned. The Botswana Bureau of Standards has an important role in the monitoring the quality of water and the violation of laws in place regarding disposal of waste.

- *South Africa:*

Ms Lebeloane gave a comprehensive overview of the law applying to freshwater resources in South Africa and its application to groundwater. After outlining the SADC protocol as well as the ORASECOM agreement, Ms Lebeloane explained the challenge of processing and sharing data due to limited capacity and resources to collect it. There is no private ownership of groundwater as in the two other countries. While the applicable Act (NWA) provides that illegal drilling and abstraction can be prosecuted, the NWA provides for unregulated abstraction for Schedule 1 category users based on volumes and uses. Schedule 1 category users are not obliged to register for a license, and therefore not necessary to apply the "Polluter-Pays-Principle" to them.

- *Highlights of the discussions after the presentations:*

The gender component has not yet been included in the analysis, and data on enforcement have not yet been obtained. There was an agreement on the importance of looking into less formal institutions such as farmer associations (especially in Namibia) - which could be included in a field study. It was agreed that the specialists should take into consideration in their analysis the gap between legislations present on paper and the real actions that exist in the field. There are some differences in the reporting formats used by the different specialists. It is important for information to be shared across the three countries so that reporting formats are standardized, and will further facilitate the harmonization of data.

4.2.2 Data harmonization and assessment

The meeting was held on parallel sessions on hydrogeology, socioeconomics/environment, and legal/institutional to discuss about data harmonization and assessment

4.2.2.1 Legal & institutional group parallel session reported by Ms Kinyaga (Namibia)

There was a general consensus in the group that they have collected most of the information that is required. It was noted that the specialists from Namibia and Botswana have been engaged in the process longer than South Africa. With the information collected, it was agreed that the specialists were ready to start harmonization while continuing to fill in the remaining gaps.

Mr Ross introduced the draft indicators based methodology for data harmonization that has been prepared by Mr Burchi and shared by Mr Ross. It combines the information from 50 questions into 14 indicators characterized by different variables. It also includes formulas for scoring of the indicators (and variable "characterizers"), and allows the specialists to give a score to the questions. The scores are then added up to give an approximate measurement or overall impression/status of legal and institutional frameworks for the governance of TBA's at the transboundary and domestic levels of the issue being assessed.

There were some concerns raised about the proposed system of scoring legal indicators. Mr Kaufmann commented that scoring may be contentious in a transboundary setting, and it may be better to do qualitative comparative analysis and identify examples of best practice.

The specialists might need guidance in completing the template. It was recommended that an open communication with all the experts on technical matters would take place during the harmonization phase. This is to ensure that the team would be working together and following the process equally.

The specialists might also make general remarks on how groundwater management and protection is linked to other national priorities e.g. of poverty alleviation, employment creation etc.

At some point, the specialists would want to see how the assessments from the three discipline areas come together (i.e. hydrogeology, socio-econmics & environment, legal & institutional).It was agreed that the specialists will provide feedback on the template by mid-November. Reports on harmonized data will be submitted by mid-December.

The group did not address the proposed gender indicators regarding the legal and institutional component due to time-constraints and they agreed to address the issue at a later stage.

4.2.2.2 Hydrogeological group parallel session reported by Ms Leshomo (South Africa)

The majority of the information can be merged and compared. The specialists agreed to restrict data collection to the period after 1977. Total groundwater depletion volume cannot be easily determined because of a lack of long-term water-level data.

Concerning depletion, the specialists agreed on trying to analyze available monitoring data knowing that long term data would be needed.

Specialists also agreed on focusing on collecting priority data, with less emphasis (larger-scale analysis) on variables such as temperature that are not central to the aquifer assessment.

Mr Nijsten raised a number of questions to be resolved including the outputs from climate data, classifications of land use, the possibility of using the very limited amount of long-term time series data in conjunction with shorter-term series to build a picture of trends in variables such as recharge and groundwater depletion

4.2.2.3 Socioeconomic group parallel session reported by Ms Mosetlhi (Botswana)

There had good discussions on how to present harmonized results in way that the results can also be understood by non-groundwater specialist. Agreements were made on classifications and on ways to present the results per category (maps, tables, explanatory texts). The difficulty in presenting results is not only in presenting for example groundwater quality data in a clear way, but also that the countries

normally report in different numbers of categories and are using different thresholds for the categories. It was agreed to report in 3 categories: 1) good quality for GW with a TDS < 1000 mg/l, 2) Acceptable for GW with a TDS in the range of 1000 – 2000 and 3) Not suitable for TDS > 2000. A similar approach will be followed for fluoride and nitrate and also in relation to suitability for live-stock watering. The group also agreed on approaches for harmonizing and presenting data on groundwater pollution, solid waste and waste water control, population and groundwater use.

For data relation to population there is the issue / complication fact that that administrative boundaries do not match aquifer boundaries. To solve this it will be necessary to obtain more detailed information locally.

Direct data on groundwater use are very limited available. It was agreed that an estimation of groundwater use will be made, based on proxy variables such as cattle numbers, population numbers and land areas. The group agreed on focusing on fact finding at this stage of the project, while recognizing that qualitative data are as important as quantitative data.

4.3 Day 3 (Wednesday, 22 October 2014)

4.3.1 Workplan for data harmonization and joint assessment

4.3.1.1 Adoption of workplan for data harmonization and joint assessment

- *Gender Methodology - revised proposal presented by Ms Greco*

Ms Greco introduced categories and priorities for gender data collection, adjusted following the discussions during the meeting. It was agreed to concentrate on the collection of data for 11 gender specific variables that can be feasibly collected from existing data – Annex 3. Data for several other variables could be collected in future if funds became available. It was decided not to proceed with analysis of the remaining variables.

- *Forward look to the aquifer assessment*

Mr Ross identified some issues to be considered prior to the aquifer assessment including the relative emphasis on hydrogeological, socioeconomic, environmental, legal and institutional issues, and whether the assessment should focus on subject areas or problems. He introduced transboundary governance issues including conflicts and cooperation, and raised the importance of joint monitoring. He also covered different categories of outputs from the assessment. Finally he introduced the roles and responsibilities of different parties to the assessment and the engagement with stakeholders.

- *Highlights of concluding discussion*

Mr Nijsten introduced the final session of the meeting by presenting a work program for the remainder of 2014 and 2015 (Table 2). He identified the tasks, responsible parties and deadlines. The work program was agreed by participants at the meeting.

What	Who	Deadline
Last data collection, including gender	National specialists	30 November
Overview of available data and define focus • Hydrogeological • Socio-economic • Environmental • Legal & Institutional • Gender	-Regional coordinator -Stefano Burchi -Francesca Greco	15 December
Data harmonization <u>TBA LEVEL</u> • Clear overviews of data • Output MAPS in GIS • Output TABLES • Output NARRATIVES • Calculation of indicators	National specialists in transboundary teams	Complete draft: 15 December
Reviewing draft harmonization	Regional coordinator, UNESCO, IGRAC	15 January
Finalizing harmonization products	National specialists in transboundary teams	Final report 15 February
Uploading into IMS	National specialists & IGRAC	15 March
Assessment outline	UNESCO	30 November 2014
Draft assessment report and materials	National specialists, Regional coordinator	Early March 2015
Review of draft assessment	UNESCO, WWAP, IGRAC	Mid March 2015
Final assesment report and materials	National specialists, Regional coordinator, UNESCO, WWAP, IGRAC	Mid April 2015

Table 2 – GGRETA project (Stampriet Case Study) work program for the remainder of 2014 and 2015

Mr Kirchner shared his views about the project. He stressed on the importance to gather additional information on discharge, land use, climate issues and rainfall. However he pointed out that focus for a joint monitoring of the aquifer should not be given to long-term research, but rather to available data. Participants pinpointed the challenges of having a conceptual model because of the aquifer system heterogeneity and basic data that are yet to be collected.

The discussion highlighted that there is no immediate threat of over exploitation of the aquifer but local over abstraction may occur under current conditions. It is then possible to foresee future threats to the aquifer if exploitation continues to increase.

Mr Ross reminded participants that the project aquifer assessment would be used to develop a proposal for a multi-country consultation mechanism. The scale and the boundaries are crucial for effective harmonization. If the specialists work jointly beyond their countries' boundaries and within the aquifer system as a whole, it will be more efficient to have common assessment and draw common strategies, especially if the specialists cooperate in a multidisciplinary dimension.

Participants discussed the importance of avoiding future conflicts and promoting cooperation. There are a number of potential areas for cooperation such as sharing data about the aquifer, build a common database for the aquifer, improving monitoring and increasing the number of monitoring boreholes. Also it was recognized that the countries had some common groundwater management challenges in regulating groundwater use and dealing with pollution in small remote communities. Participants agreed that further work should be done on exploring potential for cooperation.

4.3.1.2 Closing remarks

Mr Obakeng (Botswana) acknowledged the utility of such meetings and offered to host the next technical meeting in May 2015.

Ms Ileka (Namibia) thanked the host and shared their eagerness for further collaboration with the other specialists.

Ms Lebeloane (South Africa) remarked on the value of 3 days of intense discussions during the technical meeting, and highlighted that it was pleasing that unlike when the meeting began, there is a sigh of relief that the project in now on tract. The project provides an important opportunity for capacity building in the field. Ms Lebeloane thanked the participants, the coordinators and the organization for their presence and looked forward to the next meeting in Botswana.

ANNEXES

Annex 1 - Meeting agenda

Groundwater Resources Governance in Transboundary Aquifers (GGRETA Project)

Stampriet - Kalahari/Karoo Aquifer Case Study

Final Programme

Third Regional Technical Meeting

Pretoria (South Africa)

20-22 October 2014

DAY 1 • Monday, 20 October 2014, Pretoria, South Africa

Objectives:

- **To report to national governments and the donor representatives on the three countries' collection and processing of hydrogeological, socioeconomic and environmental and legal and institutional data**

9:00-10:00	**Opening Session**	
	Welcome remarks from the South African Ministry for Water and Sanitation	Director General, Ministry for Water and Sanitation, South Africa (TBC)
	Welcome remarks from UNESCO-IHP	Mr Andrew Ross, UNESCO – IHP, France

	Message from the Swiss Agency for Development and Cooperation Messages from participating countries	Mr Manfred Kaufmann (Africa Regional Policy Advisor for Water), Switzerland Ms Deborah Mochotlhi, Deputy Director General, Department of Water and Sanitation, South Africa Mr Obolokile T. Obakeng, Director, Department of Water Affairs, Botswana Mr Aina Ileka, Chief Hydrogeologist, Department of Water Affairs, Namibia
10:30-12:30	**Recap on GGRETA project main components and meeting objectives**	
10:30-11:00 *11:00-11:30* *11:30-12:00* *12:00-12:30*	• Overview of the GGRETA Project: objectives, activities, budget, deliverables • Capacity and Skills Enhancement Toolkit for Hydrodiplomacy applied to transboundary aquifer management • Gender component methodology • Data harmonization: objectives and issues	Mr Andrew Ross, UNESCO-IHP, France Mr Ralph Mahfoud, UNESCO- PccP, France Ms Francesca Greco TBA Water and Gender Focal Point, UN World Water Assessment Programme - WWAP, Italy Mr Geert-Jan Nijsten, IGRAC, The Netherlands
12:30-14:30	**Lunch**	
14:30-18:00	**Reports on data collection and processing**	**Chair: Ms Aina Ileka**

14:30-16:15 *14:30-14:45* *14:45-15:00* *15:00-15:15* *15:15-16:15*	Hydrogeological data: Namibia - Ms Lydie Joel and Ms Gettie Mulokoshi Botswana - Mr. Gaolatlhe Lentswe South Africa - Ms. Joyce Leshomo Discussion	
16:15-16:30	**Coffee break**	
16:30-18:00 *16:30-16:45* *16:45-17:00* *17:00-17:15* *17:15-18:00*	Socioeconomic and environmental data including gender issues Namibia - Mr Don Muroua Botswana - Ms. Bothepha Mosetlhi South Africa - Mr. Bantu Hanise Discussion	

DAY 2 • Tuesday, 21 October 2014, Pretoria, South Africa

Objectives:

- **To report to national governments and the donor representatives on the three countries' collection and processing of hydrogeological, socioeconomic and environmental and legal and institutional data**
- **To discuss the harmonization of hydrogeological, social, environmental, legal and institutional data, including priorities and presentation**

9:00-10:15	**Reports on data collection and processing (continued)**	**Chair: Ms Aina Ileka**
9:00-10:30 *9:00-9:15*	Legal and institutional data including gender issues Namibia - Ms Viviane Kinyaga	

9:15-9:30 *9:30-9:45* *9:45-10:30*	Botswana - Ms Bothepha Mosetlhi South Africa - Discussion	
10:30-11:00	**Coffee break**	
11:00-17:30	**Data harmonization and assessment**	**Chair: Mr Piet Kenabatho**
11:00-12:30	Hydrogeological data Variables A, B and C	
12:30-13.30	**Lunch**	
13:30-15:00	Socioeconomic and environmental data Variables D and E	
15:00-15:15	**Coffee break**	
15:15-16:45	Legal and institutional data Variables F	
16:45-17:30	Recap and discussion of main points raised during the day	

DAY 3 • Wednesday, 22 October 2014, Pretoria, South Africa and Windhoek, Namibia

Objective:

- **To agree on workplan for data harmonization and joint assessment of the Stampriet aquifer**

9:00-12:30	**Workplan for data harmonization and joint assessment**	**Chair: Mr Ramogale Sekwele**

9:00-9:30 *9:30-10:30*	Gender methodology - Revised Proposal Introduction Francesca Greco: 10 min Discussion and conclusions: 20 min Forward look: Final outcome phase I Introduction Andrew Ross: 15 min Discussion and conclusions: 45 min	Ms Francesca Greco TBA Water and Gender Focal Point, UN World Water Assessment Programme - WWAP, Italy Mr Andrew Ross, UNESCO-IHP, France
10:30-10:45	**Coffee break**	
10:45-12:15 12:15-12:30	Adoption of workplan for data harmonization and joint assessment Closing remarks	

Annex 2 - List of participants

Nr.	Name	Country	Organisation	Position	Contact Details
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Annex 3 – List of preliminary gender indicators by UNESCO-WWAP for Stampriet Case Study

	Feasible
	Feasible if resources are made avilable
	Not feasible
	Not yet feasible

G+: Existence of gender-disaggregated data

G-: Non-existence of gender-disaggregated data

GENERAL INFORMATION		
Question	Stampriet	Comments
Percentage of female and male population from the total population in the aquifer's area	Yes	Socio-economic expert

Percentage of rural and urban population in the aquifer's area disaggregated by sex	Yes	Socio-economic expert
Mortality rate for female and male population in the aquifer area	Yes	Socio-economic expert
Education level by female and male population in the aquifer area	Yes	Socio-economic expert

1. WATER GOVERNANCE		
Questions	Stampriet	Comments
Number of M/F paid staff in public water-governance agencies, disaggregated by job category/level and decision-making capacity (and salary, if available), at: • national level • county/ province/state level • town/ village level (sample)	Yes	% (W/M) No. (Legal expert)
Number of M/F in paid and unpaid positions in local water governance formally-structured entities (water users associations, etc) at town/ village level (sample) • disaggregated by nature of relationship to the entity (e.g., "member", "board", "executive", "leadership," decision-making group, etc) and types of tasks	Yes	% (W/M) No. (Legal expert)

Intensity of M/F participation in (sample/representative) meetings of public entity bodies sampled at national, sub-national, and local levels, including outcomes such as: ratio of contributions in decision-making meetings by women and men; percentage of decisions adopted from women's contributions in meetings		
M/F perceptions of gender discrimination (or equality) regarding women's participation in decision-making entities.		From 1 to 10, how much you think women are discriminated in participation in water decision-making entities? (1 = not discriminated, 10= totally discriminated) Performed for women and men. Sample should be anonymous and relevant in nu
Number of staff responsible for WASH issues, (disaggregated by sex and job level) in gender ministry/ lead agency.		% (women /men) No. of staff members
Number of staff responsible for gender issues (disaggregated by sex and job level) in lead agency for WASH.	Yes	% (women /men) No. of staff members (Legal expert)
Designated ministerial responsibility for gender in relation to WASH policies; • are gender-specific machineries included in WASH sector decision-making.		Text G+/G- (present or not present)
Presence and nature of gender sensitive training within responsible ministries/ lead agencies. Participation of M/F staff	Yes	G+/G- (presence /non presence) (Legal expert)
The extent to which gender outcomes and gender-sensitive		

accountability indicators are included in M&E/ impact statements/ benefits analyses of national-level WASH-sector projects (project proposals and/or outcomes assessments). Sample projects.		
The presence and nature of gender-specific objectives and commitments (or gender strategy) in national and sector-level water policies		G+/G- (existence of)) (Legal expert)

2. SAFE DRINKING WATER, SANITATION AND HYGIENE		
Questions	Stampriet	Comments
Percentage of households without water on premises, by sex of main person responsible for collecting drinking water and by type of household.• rural/ urban samples	Yes	% (Socio-economic expert)
Unpaid time spent by individual household members in supplying water, making it safe for use, and managing it (M/F informants).		
M/F perceptions of the adequacy of current water supply/ availability in both quality and quantity.		From 1 to 10, how do you evaluate the current water supply/availability in both quality and quantity is adequate to your needs (1 = not adequate, 10= totally adequate), for women and men. Sample should be anonymous and relevant in number

Percent households with access to “improved” sanitation facility, by household structure and by nature of the “improved” facility	Yes	% (Socio-economic expert)
Intra-household M/F use of /access to improved sanitation facilities		
M/F prioritization of gaining access to improved sanitation facilities • willingness to allocate household budgets for such access		
M/F perceptions of the safety of sanitation facilities that are located outside the house • identified particular safety concerns		From 1 to 10, how do you evaluate the safety of sanitation facilities that are located outside the house are safe? (1 = not safe, 10= totally safe), for women and men. Sample should be anonymous and relevant in number

3. DECISION MAKING AND KNOWLEDGE PRODUCTION		
Questions	Stampriet	Comments
The nature and extent of gender-disaggregated data related to water and sanitation collected by responsible public entities at national and local levels (in relation to the totality of social indicators on water and sanitation collected).	Yes	Text G+/G- (Legal expert)

M/F participation in past decade of two major global international water meetings (and nationally-significant comparable meetings): • World Water Week (Stockholm) • World Water Forum (World Water Council)		N° of W/M, % (W/M)
M/F inclusion on nationally and internationally convened scientific panels and advisory boards		N° of W/M, % (W/M)
M/F perceptions of: • the nature of their household decision-making process for water priorities and use; • the primary decision-maker within the household (if any); • how intra-household conflicts related to water (if any) are resolved		
M/F perceptions of/ knowledge of current total household use of water, by category of use and by primary user		
Household member primarily responsible for managing the household's use and supply of water, by nature of use (M/F informants/ perceptions).		
M/F expressed priorities for water use within households		
Gender audit of WHO/ UNICEF "Joint Monitoring Program."	Yes	Text G+/G- (presence of gender audit /non presence)

		(Legal expert)
M/F perceptions of household gender equality in WASH decisions		From 1 to 10, how much do you think women are discriminated in WASH decisions? (1 = not discriminated, 10= totally discriminated) Sample should be anonymous and relevant in number.

4. INTERNATIONAL WATER RESOURCES MANAGEMENT		
Questions	Stampriet	Comments
Number of M/F staff on transboundary water commissions (sample for pilot countries), disaggregated by job category/level and decision-making capacity (and salary, if available)		N° of W/M, % W/M
The extent to which gender outcomes and gender-sensitive accountability indicators are included in M&E/ impact statements/ benefits analyses of transboundary agreements/ activities.		
The presence and nature of gender-specific objectives and commitments (or gender strategy) in transboundary agreements		G+/G- (presence /non presence)
Intensity of M/F participation in (sample/representative) meetings of		N° of contributions to decisions No.Decisions adopted

transboundary meetings, including outcomes such as: ratio of contributions in decision-making meetings by women and men; percentage of decisions adopted from women's contributions in meetings.		Text: This enquire requires participatory observation with observants in meetings.

5. WATER FOR INCOME GENERATION FOR INDUSTRIAL AND AGRICULTURAL USES, INCLUDING UNACCOUNTED-FOR LABOUR		
Questions	Stampriet	Comments
% irrigated farms in region under survey; % irrigated farms managed by/ owned by M/F.	Yes (only Botswana and Namibia)	%
Average size of irrigated farms run by/ owned by women/ men		ha/W , ha /M
Gendered division of labor related to irrigated farming: • gender- specific tasks related to irrigated crops, by nature of tasks; • gender differentiated daily time-use of household members involved in irrigated farming work.		
Decision-makers and participants in household-based decision-making process regarding irrigation (M/F informants/ perceptions)•		

decisions re allocation of time and financial resources; crops to be irrigated		
Decision-makers and participants in community-based decision-making process (if any) regarding irrigation (M/F informants/ perceptions) • decisions re allocation of time and financial resources; crops to be irrigated		
M/F perceptions of gender discrimination (or equality) regarding women's participation in decision-making in relation to irrigation Note: Question: From 1 to 10, how much you think women are discriminated in irrigation decisions? (1 = not discriminated, 10= totally discriminated) Sample should be anonymous and relevant in number.		W (from 1 -10) M (from 1 -10)
M/F access to support services for irrigation: • participation in technical training • M/F access to bank loans/ credit, and incentives for the development of irrigated agriculture		% W/M
M/F membership in and intensity of participation in community-based irrigation committees.		% W/M for membership % W/M of presence in meetings