United Nations
Educational, Scientific and
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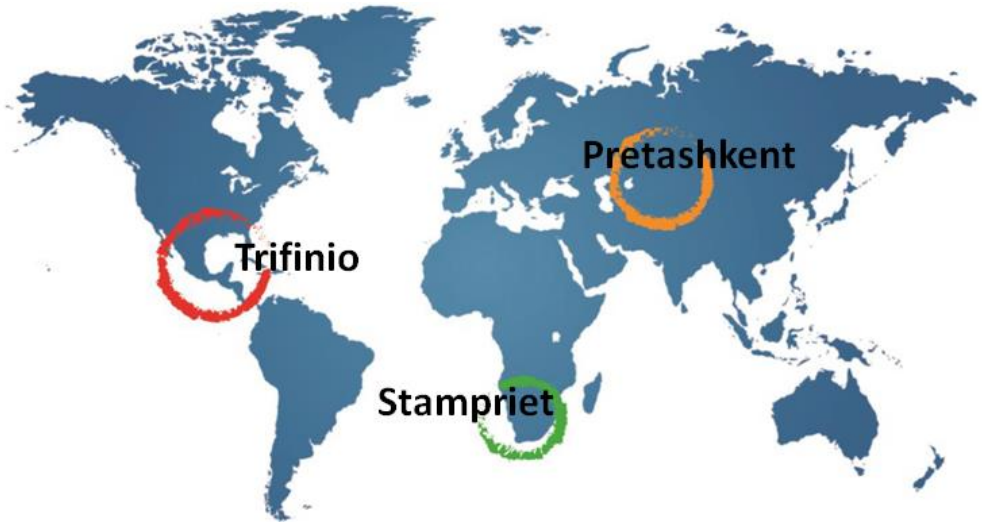
International
Hydrological
Programme

Governance of Groundwater Resources in Transboundary Aquifers (GGRETA) Project



SUMMARY OF THE GGRETA PROJECT PHASE 1

FINAL MEETING

15-16 December 2015

Rooms XIII, XIV and XV (Miollis Building)
UNESCO HQ, Paris, France

Schweizerische Eidgenossenschaft
Confédération suisse
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Swiss Agency for Development and Cooperation SDC

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BACKGROUND

This project is executed within the framework of the Swiss Agency for Development and Cooperation (SDC) "Global Programme Water Initiatives (GPWI) – Water Diplomacy" activities, UNESCO International Hydrological Programme (IHP) has been entrusted to undertake a project entitled "**Governance of Groundwater Resources in Transboundary Aquifers (GGRETA)"**. The GGRETA project Phase 1 (2013-2015) aimed at conducting a detailed multi-disciplinary study of transboundary aquifers in three selected case studies. The three transboundary aquifers selected are:

- the Pretashkent Aquifer (Kazakhstan and Uzbekistan),
- the Stampriet Transboundary Aquifer System – STAS (Botswana, Namibia and South Africa),
- the Trifinio Aquifers Complex (El Salvador, Honduras and Guatemala).

GGRETA PROJECT OBJECTIVES

The main goal of the project is to enhance cooperation on water security, prevent transboundary and water-use conflicts, and improve overall environmental sustainability. The project aims to reinforce the capacity of Member States in managing groundwater resources; strengthen cooperation among countries sharing the aquifer; and develop a long term strategy for the monitoring and governance of the transboundary aquifer.

The overall project's objectives are as follows:

- Improve the knowledge and recognition of the importance and vulnerability of transboundary groundwater resources
- Strengthen cross-border dialogue and cooperation
- Develop shared management tools
- Facilitate governance reforms focused on improving livelihoods, economic development and environmental sustainability

MAIN OBJECTIVES OF GGRETA PROJECT PHASE 1 FINAL MEETING

The objectives of the meeting were:

- Present the GGRETA project main findings and achievements,
- Underpin the role of science in decision-making in the context of transboundary aquifer cooperation,
- Discuss the role of emerging legal instruments in the management of transboundary aquifers, as well as to explore the value of water and the role it plays in transboundary aquifer cooperation.
- Receive feedback, guidance, and recommendations from participating stakeholders.

The Agenda of the meeting is attached as Appendix 1 to this report. The List of Participants is attached as Appendix 2. All presentations are available at https://www.dropbox.com/sh/sgrhhh9yveahw73/AAAxFG4QZFWnlE-R9N6wL3xma?dl=0.

MAIN OUTCOMES OF GGRETA PROJECT PHASE 1

GGRETA project main findings

Most of the goals and outcomes initially foreseen were fully achieved, although with marked differences among the three aquifers due to the diverse characteristics and specificity of the national and regional context of the three aquifers (capacity, legal, institutional, policy settings, of the countries involved, and to differences in availability of relevant data and information.

The key and overarching conclusion from the assessments is that, unless it is underpinned and facilitated by a solid legal and institutional foundation domestically, groundwater governance frameworks at the transboundary level will not be forthcoming in terms of negotiating new frameworks. The outcomes of the assessment studies demonstrate that good governance is highly desirable. They also suggest that managing and governing a transboundary aquifer has to start at the domestic level, i.e. at the level of the individual countries. The transboundary issues are only a limited part of all issues to be addressed. More benefit is to be achieved already by a better protection and control at the local and national levels, while solving transboundary problems will be arguably much easier, if groundwater governance at the national level is already satisfactory. Moreover, it was evaluated that domestic groundwater governance frameworks need either review and upgrading of Water Laws or complementing Water Law with Regulations. Strengthening domestic capacities in implementation and enforcement is necessary to support cooperation in the three pilot cases. The project has provided firm steps to facilitate governance reforms and models for the establishment of a mechanism aimed at facilitating cooperation for the management and governance of the Stampriet aquifer. Such models have been presented to riparian Countries for their consideration.

Activities developed in the three aquifers evidenced the lack of gender consideration in water management and use, as well as the scarcity of relevant data (not just for groundwater, but also for water in general). This first assessment reveals the need of pursuing domestic level capacity building activities on water and gender focused on the pilot transboundary aquifers, but applicable to all water resources in the GGRETA countries.

GGRETA project Phase 1 main achievements

Main achievements of the GGRETA project Phase 1 were presented, and are listed as follows:

- **Improved knowledge and recognition of the importance and vulnerability of transboundary groundwater resources:**
    - Detailed assessment reports representative of hydrogeological, socio-economic and environmental, gender, and legal and institutional conditions and settings finalized for each case study. A final project technical report covering the three case studies has been prepared and will be available in English, Russian and Spanish.
    - Application of an indicator-based methodology as a tool able to summarise in a nutshell a number of important aspects of the system considered and bring them under attention of decision-makers, planners and other stakeholders.

- The indicator-based methodology developed for multi-disciplinary assessment of transboundary groundwater resources proved to be a very useful and valuable tool and permitted to detect salient features as follows:
  - Very low recharge of Stampriet and Pretashkent aquifer versus medium to very high recharge of the Trifinio.
  - Natural background groundwater quality tends to be more favourable for smaller-sized aquifer
  - High buffering capacity of the Stampriet and Pretashkent aquifers versus low to medium one of the Trifinio.
  - Vulnerabilities to climate change and to pollution are high for the Trifinio aquifer and low for the Stampriet and Pretashkent aquifers[1].
  - Groundwater is very important for domestic water supply in all three areas.
  - Only in the Stampriet area does agriculture highly depend on groundwater
  - No significant pollution or depletion have been reported in the three transboundary aquifers.
  - Population density is high in the Trifinio area and very low in the Stampriet and Pretashkent.
  - A transboundary legal framework for the transboundary aquifers is missing in all three areas
  - The same holds true for a transboundary institutional framework for the transboundary aquifers, but in Trifinio and Stampriet there are regional bodies that could be entrusted with a mandate for transboundary aquifers management.

- **Strengthened cross-border dialogue and cooperation:**
  - Trainings in water diplomacy tailored to technical experts and ministries representatives focusing on trust building, conflict prevention and resolution, cooperation and negotiation have proven to be extremely useful to support the process of collaboration in all three case studies.
  - Training seminars on legal and institutional aspects of water governance covering international to domestic perspective have been realized in the three case studies. Seminars included training not only in international water law, but also on the linkages between international legal obligations and domestic water legislation. As a result, participants (technical experts, and ministries representatives) were exposed to the underpinnings of the management of water resources at the transboundary level, including compliance and the implementation of national water legislation.
- **Development of shared management tools:**
  - An Information Management System (IMS) has been developed and is operational in the three case studies. The IMS will act as a platform for countries to store and exchange information (maps, tables, meta information) and experience on transboundary aquifer management.
  - Data collected throughout the project led to the compilation of databases that were crucial for the preparation of more than 100 thematic maps providing information on climate, land use, groundwater levels, quality, and yield. All this information is available in the IMS developed by the project (https://ggis.un-igrac.org/ggis-viewer/ggreta/regions).

[1] Applies only to the deep confined aquifers

- **Facilitation of governance reforms focused on improving livelihoods, economic development and environmental sustainability:**
    - Presentation of two models for the establishment of a Co-operation Mechanism aimed at facilitating cooperation for the management and governance of the Stampriet aquifer.
    - Gender sensitive data was collected in the field and will provide substantial information of innovative topics, such as women and men's roles in water decision-making, water use, irrigation techniques.

GGRETA PROJECT PHASE 1 FINAL MEETING SUMMARY

Opening Remarks and Announcement of GGRETA project Phase 2

Ms Blanca Jimenez-Cisneros (Director, UNESCO-IHP) opened the meeting and welcomed all participants. She stressed that UNESCO-IHP recognizes the importance of water for human rights and dignity, sustainable development and lasting peace, and is committed to address challenges to Water Security in IHP VIII through multidisciplinary approaches to water resources management, including relevant social, economic, political and cultural aspects. Groundwater resources play a strategic role of sustaining human development and healthy ecosystems and this is recognized in the current phase of the IHP that devotes a full thematic area to the study and the governance of "Groundwater in a changing environment". Following Resolution XIV-12 of the Intergovernmental Council of UNESCO's IHP in 2000, Member States decided to adopt a resolution to promote studies in regard to internationally shared aquifers. In 2002, the Internationally Shared Aquifer Resources Management (ISARM) project was launched and has since then identified around 600 transboundary aquifers in the world. However, much still needs to be done, mainly because of the existing lack of data. In this connection, she thanked the Government of Switzerland and the Swiss Agency for Development and Cooperation (SDC) for funding the Governance of Groundwater Resources in Transboundary Aquifers (GGRETA) project and allowing an in-depth assessment of three transboundary aquifers that are representative and of great importance in their regional context:

- the Pretashkent Aquifer (Kazakhstan and Uzbekistan) in Central Asia,
- the Stampriet Transboundary Aquifer System – STAS (Botswana, Namibia and South Africa) in Southern Africa,
- the Trifinio Aquifers Complex (El Salvador, Honduras and Guatemala) in Central America.

Finally, she highlighted that the unique experience gained by UNESCO on the assessment of transboundary aquifers, and the results of recent efforts promoted by the Global Environment Facility (GEF) and led by UNESCO (e.g. Groundwater Governance Project and Transboundary Water Assessment Programme - TWAP) together with the ones of GGRETA Phase 1 have allowed bringing to the global attention the importance of transboundary groundwater resources, and the need to substantially improve their governance. As a result, achieved results represent a timely and strategic contribution to the achievement of the Sustainable Development Goal (SDG) Target on water cooperation (6.5.2).

The Government of Namibia through its Permanent Delegate to UNESCO, H.E. Ambassador Ms Frieda Nangula Ithete stated that water resources should be seen as a catalyst for peace and regional

integration rather than a source for conflict, as it is the case in the Southern African Development Community (SADC) region. She emphasized the importance of the Stampriet aquifer to Namibia for economic activities such as irrigation and livestock watering, and strongly supported the initiative to keep working in close collaboration with Botswana and South Africa to head towards developing long term strategies for setting up a Multi-Country Co-operation Mechanism (MCCM) for the joint management and governance of the aquifer.

The session finished with the intervention of H.E. Mr Jean-Frédéric Jauslin (Ambassador, Permanent Delegate of Swiss Confederation to UNESCO) who welcomed participants and highlighted that GGRETA project is the result of Switzerland's engagement in global water issues to help prevent water conflicts at an early stage and to promote water as an instrument of peace and cooperation. He emphasized UNESCO-IHP's long-standing experience and expertise in transboundary water cooperation and transboundary aquifers, and formally announced on behalf of SDC that a second phase of the project was approved.

Official Statements by Government Representatives and Regional Organizations supporting GGRETA project

The Government of Honduras through its Permanent Delegate to UNESCO, H.E. Ambassador Mr Ramírez Aldana saluted and thanked UNESCO-IHP, IUCN and SDC, for having boosted a huge commitment in hydrological research, management, education and capacity building on water resources in various regions of the world and especially in the Central America area with the "Transboundary Biosphere Reserve Trifinio Fraternidad", which was established as the first Trinational the Americas, and one of the few in the world in this mode. Consequently, it is of great value to improve the level of knowledge and recognition of the importance of the area as well as their vulnerability, as a means to strengthen dialogue and cooperation over transboundary groundwater resources. H.E. Ambassador De Pool, El Salvador Permanent Delegate to UNESCO, also stressed the importance of the Trifinio biosphere and highlighted the key role that the Secretariat of the Plan Trifinio and the GGRETA project are playing on exchanging knowledge on the governance of groundwater resources with local stakeholders, and on providing them with training tools. H.E. Ambassador Chicas Sosa, Permanent Delegate of Guatemala to UNESCO, expressed his satisfaction with the project's achieved as they permitted to better describe the physical characteristics and delineation of the Trifinio aquifer. Ms Celina Mena (Ministry of Environment and Natural Resources, El Salvador) and Mr Rolando Alberto (Plan Trifinio) expressed their great satisfaction with the results of the project and stressed that the findings of the project will be the basis to strengthen and develop governance mechanisms in the Trifinio Region. They acknowledged that filling existing data gaps (especially on water quality) will be of great importance to foster this process.

The Government of Kazakhstan through its Deputy Permanent Delegate to UNESCO, Minister-Counsellor Burshakov, congratulated UNESCO-IHP for its 50th anniversary and its successful contribution to the Water and Climate Change Day at COP21. He further emphasized that GGRETA project is a timely contribution to the 2030 Agenda for Sustainable Development, and of great importance to Kazakhstan as groundwater issues are vital to his Country. Finally, he thanked SDC, UNESCO-IHP and IGRAC for the trainings and capacity building modules that were organized throughout the project. Mr Aitmurat Isaev (Committee of Geology, Kazakhstan) also highlighted the importance of groundwater resources in Kazakhstan, especially in rural areas. He added that water diplomacy is of great importance to Kazakhstan as it is the largest landlocked country in the world

with more than 2000km of border areas and 15 transboundary aquifers; and expressed the necessity to strengthen cooperation with its neighbors.

The Government of Botswana through the Deputy Permanent Secretary of the Ministry of Minerals, Energy and Water Resources of Botswana, Mr Obolokile Obakeng, stressed that the Countries sharing the Stampriet aquifer have a long-lasting history of water cooperation with the framework of SADC and that the continuation of the GGRETA project could definitely improve the livelihood of the people in the ground by providing reliable predictions to decision makers, and consequently delivering what the people want. Ms Maria Amakali (Ministry of Agriculture, Water and Forestry, Namibia) further added the need to further assess the impact of climate variability on the Stampriet aquifer. Finally, she stressed that cooperation should be encouraged by undertaking discussions aimed at establishing a Multi-Country Co-operation Mechanisms that could be established or incorporated to existent units. Representatives from Regional Organizations, ORASECOM (Mr Khahliso Leketa*)* and SADC (Mr Phera Ramoeli) welcomed the participatory initiative that has been undertaken in the GGRETA project. The later expressed that SADC stands ready to undertakes shared activities and provide support to the GGRETA project and Member States through its Groundwater Management Institute.

Presentation of GGRETA project Phase 1 main achievements

Following the opening remarks, Ms Alice Aureli (UNESCO-IHP) presented the main achievements of the GGRETA project generated relevant scientific knowledge through the indicator-based assessments for each of the three pilot areas, describing the current conditions of the aquifers, including a diagnostic of transboundary concerns, conducted with full participation of national experts; and the databases and Information Management System (IMS) for field data storage and elaboration established for each aquifer system. She added that building on the generated scientific knowledge, a strong focus was given to a water diplomacy track as a means to promote gender equality and enhance the much-needed capacity-building for improved transboundary and correlated domestic water resources governance.

Mr Neno Kukuric (UNESCO-IGRAC) provided additional information on the indicator-based assessment methodology that was applied, as well as on the Information Management System (IMS) that was developed in the GGRETA project. GGRETA's assessments had been designed mainly as desk studies, to be based on existing data and information, without substantial acquisition of new data by field work. Hence, an essential initial step in the general approach was the identification of sources of information on the target aquifers and their context, accompanied by finding out how to access the data and information. Obviously, knowledgeable national professionals were indispensable to carry out this step successfully and efficiently. Next came data processing and the harmonization and aggregation of data and information – to the extent needed. Tables, maps and other graphical presentations were prepared to facilitate analysis, interpretation and communication. The interpretation of all collected information in an integrated view culminated primarily in a proper understanding of the hydrogeological regime (conceptual model) and in conceptual building stones for transboundary aquifer management (diagnostics). Development of the dedicated software for the IMS has been carried out by UNESCO-IGRAC. In parallel, the national teams have been collecting data and developing databases of selected types of data. The information management system, although useful during the assessment phase, is primarily designed as a permanent groundwater governance tool. It is accessible, for each of the pilot areas separately, at a special GGRETA platform in UNESCO-

IGRAC's Global Groundwater Information System (GGIS). It has a public viewer –allowing to view a basic set of data– and a private viewer with access to much more information. The latter is password-protected and only available to those permitted to view all data.

The indicators presented in the methodology acted as a supporting tool in the diagnostic analysis of each aquifer system. The application of measurable and monitorable indicators proved to be a springboard to advance to the policy level. Apart from providing a better understanding of the complexity of the different factors playing a role in building countries' cooperation over transboundary aquifers governance and to identify and prioritize gaps to be filled, indicators have become an advocacy tool to communicate to higher political levels in order to gain support for both domestic and transboundary efforts. The latter is particularly relevant for the legal and institutional indicators, prepared especially for GGRETA. As presented by Mr Stefano Burchi (UNESCO-IHP), the indicator-based methodology for the assessment of legal and institutional framework for transboundary aquifers aims at analysing the status of the transboundary and domestic legal and institutional framework of relevance to TBAs. Whereas, from the GGRETA project perspective, the former indicators are regarded as priority, the latter indicators are deemed to be equally important to a rounded assessment of the legal and institutional frameworks for the governance of TBAs. Domestic legal and institutional frameworks are, in fact, directly instrumental to the effectiveness transboundary sister frameworks and, in particular, to compliance with obligations stemming from TBA-relevant bi- and multi-lateral treaties and agreements. Mr Burchi stressed that the key and overarching conclusion from the assessments is that, unless it is underpinned and facilitated by a solid legal and institutional foundation domestically, groundwater governance frameworks at the transboundary level will not be forthcoming in terms of negotiating new frameworks. The outcomes of the assessment studies demonstrate that good governance is highly desirable. They also suggest that managing and governing a transboundary aquifer has to start at the domestic level, i.e. at the level of the individual countries. The transboundary issues are only a limited part of all issues to be addressed. Strengthening domestic capacities in implementation and enforcement is necessary to support cooperation for the management in the three pilot studies.

Presentation of the main findings of the Pretashkent Aquifer assessment

Mr Oleg Podolny (National coordinator, Geology Committee, Kazakhstan), Ms Valentina Salybekova (National expert, Kazakhstan) and Suren Gevinian (UNESCO-IHP) presented the main findings of the Pretashkent case study. The Pretashkent Transboundary Aquifer (PTBA) is a unique source of deep lying fresh groundwater in Central Asia, located within the territories of Kazakhstan and Uzbekistan. The population of 463 400 in the Kazakhstani segment of the area underlain by this aquifer depends greatly on the PTBA groundwater, which in the most part of its distribution is the only source for drinking water supply. Groundwater of the PTBA is mineral by its quality and is widely used for Spa and bottling in Kazakhstan and in Uzbekistan.

Groundwater storage depletion is unavoidable under the present groundwater abstraction regime, since the rate of abstraction is too high to be compensated by an increase in recharge and/or a decrease of natural discharge. In effect, none of both natural groundwater budget components is likely to change significantly on the short and medium term, thus the PTBA behaves virtually as a non-renewable aquifer, which means that abstracted groundwater is taken mainly from groundwater storage. At present, groundwater abstraction is predominantly by free- owing wells (artesian wells), but the groundwater levels are declining quickly (around 1 m per annum) since water is released by

elastic decompression. After losing artesian hydraulic head, the well will need to be pumped, year after year lifting groundwater from greater depths, which leads to progressively higher cost of water and on the longer run also to technical problems. The mandated government authorities and the local stakeholders together should de ne which pathway towards depletion would be most optimal, taking into account the rising water demands triggered by demographic and economic development at the one hand, and the desirability of a long useful life of the PTBA at the other. It will be indispensable to consider the Kazakhstani and Uzbekistani segments together and to use a simulation model to explore alternative development options.

Demographic and economic development most likely remain important drivers that lead to progressively increasing water demands in the area. Nevertheless, several types of mitigating measures may reduce the demands for water from the TBA, for instance:

- Abstracting brackish and saline groundwater from overlying aquifers and using it – after desalination and other forms of treatment (if needed) – for drinking water supply;
- Implementing demand management measures (e.g. control of leaks and other losses in distribution networks);
- Reconstructing inadequate water supply networks;
- Creating motivation and incentives for the adoption of water-saving techniques by the general public;
- Implementing regulations with financial incentives (taxes, credits, grants) for enterprises that adopt water-saving techniques.

Groundwater quality degradation inside the PTBA is unlikely to happen in the short run (except locally in the recharge zones), but it might become a problem in the longer run, only after the hydraulic heads in the aquifer will have declined enough to induce ows of poor-quality groundwater from overlying aquifers. Nevertheless, the pollution risks of the shallow aquifers in the PTBA area are considerable and should not be overlooked, because if groundwater of these aquifers becomes unsuitable for satisfying the current uses, then the PTBA comes under the pressure of substituting the corresponding volumes of water. It is clear that both key issues have a transboundary dimension. Changes in pressure in the con ned PTBA rapidly propagate in lateral direction, potentially resulting in modified groundwater fluxes across the international boundary. The bulk of transboundary water quality degradation moves through surface water bodies (like Keles irrigation canal), but groundwater may be indirectly affected by infiltration of these surface waters.

Only a few groundwater governance aspects have been touched upon during this project phase. This refers in the first place to *information and knowledge*. Apart from the fact that Uzbekistani information is largely missing in this assessment, it may be concluded that also the information on the Kazakhstani segment is still subject to many uncertainties, in particular by lack of time series of relevant variables (groundwater abstraction data, water levels, groundwater quality data both for the PTBA and overlying aquifers) and by insufficient data sharing between the different Kazakhstani state organisations. Upgrading of monitoring networks and monitoring practices is therefore recommended, as well as improving cooperation between the state organizations. Overall progress in the development of groundwater resources management of the PTBA at the domestic level is slow in both countries. Not only because of insufficient monitoring data (see above), but also by deficiencies in national planning and coordination between various authorities and other entities that have a stake in the area's water resources. Insufficient budgeting of the corresponding

government authorities may be one of the underlying reasons. Other identified specific needs for improving groundwater governance include:

- Developing legislation and regulations to enhance conjunctive use and protection of water resources at both the domestic and transboundary level,
- Raising public awareness on consequences of irrational groundwater abstraction and pollution,
- Strengthening capacity of all relevant agencies on improved groundwater resources management in line with requirements of multilateral environmental agreements,
- Finally, transboundary cooperation between Kazakhstan and Uzbekistan on the PTBA is still missing. Establishing this cooperation would be a major step forward in groundwater governance.

Presentation of the main findings of the Stampriet Transboundary Aquifer System (STAS) assessment

Mr Piet Kenabatho (STAS assessment report coordinator, University of Botswana) presented the main findings of the Stampriet case study. He stressed that in spite of a relatively modest abstraction in the area (only around 20 million cubic metres annually), groundwater is of vital importance for the area's population and its activities, because it is the only dependable permanent source of water in the area. Ensuring sustainable groundwater use is therefore a priority to keep the area suitable for human life. Groundwater is abstracted from both the (non-transboundary) Kalahari aquifers and the two transboundary aquifers (Auob and Nossob aquifers). Since the Auob aquifer is the only one of these three aquifers that contains almost everywhere water that meets drinking water quality standards, this aquifer seems to be the most valuable of the three.

Identified groundwater management issues are in the first place related to observed threats, such as:

- *Groundwater depletion:* Basically caused by abstraction rates in excess of the aquifer's coping capacity, so these rates should be controlled (by regulation and demand management) and/or recharge should be protected. The depletion risks are enhanced by leaking wells (inadequate well construction), by encroachment of water-fed vegetation such as Prosopis and by climate change; all of these need management responses.
- *Groundwater quality degradation (pollution, salinization):* Degradation can be stopped or delayed by reduction of pollution sources, or by avoiding shortcuts between aquifers or between aquifers and polluting zones at the surface (dug wells, water pans, etc.).

An additional issue is not related to threats to the groundwater resources, but rather to the opportunities offered by groundwater:

- *Making better use of groundwater for improving domestic water supply and sanitation:* Implementing safe drinking water facilities (based on groundwater) and improved sanitation would serve both public health and sustainability of groundwater resources, provided that adequate provisions are implemented for handling the associated waste and wastewater. Addressing these issues is mainly a domestic activity, since physical transboundary effects are minimal. A transboundary dimension of addressing these issues could be created by

exchanging data, information and technologies among the three countries and by carrying out joint programmes on selected interventions. This certainly has the potential to create synergy.

- *Data and information management:* Very significant data and information is available, and the project is substantially contributing to harmonizing the data and bringing them together for the entire STAS in databases and Information Management System (IMS). Nevertheless, there is still considerable uncertainty (e.g. on recharge) and aquifer-wide monitoring of important time-dependent variables (groundwater abstraction, groundwater levels, water quality, pollution sources, etc.) is missing.
- *Gender and other stakeholder issues:* Gender inequality is still high in the area (low gender sensitivity in government agencies; women's heavy burden in carrying water and exposed to risks of missing toilet facilities; women mainly involved in back-yard gardening; planning and management in agriculture are male dominated, etc.). Promising steps towards gender equality are awareness raising programmes and improvement of water supply and sanitation.

In addition to Mr Kenabatho's presentation, Mr Burchi presented additional insights on the legal and institutional component of the Stampriet case study. At the international level, some useful elements are there (SADC Water Protocol, ORASECOM Agreement and related institutions), but there are no dedicated instruments; therefore, a Multi-Country Cooperation Mechanism (MCCM) should be considered. At the national levels, the legal and institutional frameworks are in place in all three countries, but with some scope for improvement. Implementation has not been assessed but is probably the most challenging component. A Multi-Country Cooperation Mechanism (MCCM) would fill a governance gap. In addition to what the three STAS countries could do by themselves, the MCCM could produce (a) a STAS vision; (b) consistency of direction and purpose of domestic STAS-relevant action; (c) joint control of the flow of data and information into the IMS. Provisionally, two alternative models have been presented to the Countries for the MCCM, and are currently under consideration:

- *Model 1 – Coordinating STAS Committee* It would consist of a Steering Committee of senior groundwater officials, plus a research institution in each STAS country, providing scientific input to the Steering Committee.
- *Model 2 – Nesting a MCCM for STAS in the ORASECOM structure* This would entail upgrading the Hydrogeology committee of the Technical Task Team for technical matters to a new dedicated Hydrogeology Task Team, with a priority focus on the STAS.

The first model is more easy to establish, but has the disadvantage of relative impermanence of the committee and dependence on priorities and agendas of the government entity hosting it. The second model offers –among others– economies of scale, but will face competition for resources and subordination to priorities and agendas of third parties.

Presentation of the main findings of the Trifinio Aquifers Complex assessment

Mr Carlos Rosal (IUCN) and Andrea Merla (UNESCO-IHP) presented the main findings of the Trifinio case study. The assessment has produced valuable information, but it is clear that the available data, information and knowledge are still limited and subject to considerable uncertainty, both in relation to the groundwater systems in the area and to the only sparsely addressed environmental and socio-economic context. In addition, no information has been presented on the trends in time of the

groundwater state variables (groundwater levels, groundwater quality/pollution) and the drivers and pressures behind such changes (population growth, economic development, water demands, groundwater abstraction rates, improvements in sanitation, pollution loads, etc.).

The most important physical features identified by the assessment are that GGRETA's geological and geophysical surveys have enabled to delineate the Trifinio Aquifer, and have revealed also that this aquifer is in fact composed of two laterally disjunct aquifer zones located in the valley floor of the sub-basin of the Upper Lempa river: one in the Valle de Esquipulas and another one in the Valle de Ocotepeque-Citalá. Only the aquifer zone in the Valle de Ocotepeque-Citalá (OC-C) is transboundary, shared between Honduras and El Salvador. The two aquifers are however hydraulically interconnected by the Lempa river (the alluvial aquifers and the river are inseparably linked). Groundwater is of vital importance to the area, in particular as it is virtually the only source of domestic water. It is expected that the demand for domestic water will increase, and the resulting pressure on the groundwater systems will probably be intensified by irrigation water demands that cannot be met any more by surface water. It is therefore important to govern and manage the groundwater resources of the area carefully.

Pollution forms a major water resources management challenge in the area, and a diversity of pollution sources is observed, e.g. domestic solid waste and untreated domestic waste water, chemicals used in agriculture, wastewater and solid waste from agro-industrial processing, gas stations, and buried storage tanks of hydrocarbon products. The alluvial aquifers – including the transboundary Ocotepeque–Citalá transboundary aquifer – are directly exposed to these sources and very vulnerable to pollution. Without effective pollution control, their groundwater is bound to become more and more polluted over time.

At first sight, the alluvial aquifer systems do not seem to be threatened by groundwater quantity problems (such as declining water levels and exhaustion), but careful monitoring over a longer period is needed to validate this impression and to anticipate potential groundwater quantity problems in the future. Other major challenges may become apparent after improving groundwater governance in the area. Their early identification may prevent problems from escalating beyond the levels where they still can be controlled.

The assessment has shown that information and knowledge on the groundwater systems and its context are still limited. Hence, monitoring the change of state and pressures over time, and continued upgrading of information systems and knowledge are essential. Beyond assessment and monitoring, many other aspects need to be addressed to enhance groundwater governance in general and to enable sustainable management of the transboundary aquifer in the Trifinio area. This entails in particular empowerment of women and institutional aspects. Some preparatory activities have been carried out already during this phase of the project, notably the discussions on establishing a multi-actor groundwater management platform. Management of surface water and groundwater is not yet well developed in the Trifinio Region. Cooperation between actors need to be established at different levels: local, municipal, sub-national, national and tri-national. As a preliminary step, meetings were organised with representatives of these different levels: mayors, local platforms such as the *Mancomunidad Trinacional del Río Lempa,* executive and technical personnel of the Comisión Trinacional del Plan Trifinio (CTPT), academics and investigators and the water boards. An enquiry among those actors captured their views on priorities related to establishing groundwater management:

- Focal points for integrated and sustainable management: standards, policies and laws; investigations
- Themes: Promotion and awareness raising
- Stakeholder involvement: education
- Support to mayors and their corporations: education on groundwater and its management

Given the key role of women in society, the three countries and the *Comisión Trinacional del Plan Trifinio* have a policy of gender equality and empowerment of women, accompanied by programs and projects intending to reduce the gaps between women and men at all levels. The current GGRETA case study contributed by organising several workshops intended to building capacity among the personnel of the women's offices and environmental offices of the municipalities.

Finally, in order to offer optimal information services to decision-makers and other stakeholders involved in governing the transboundary and other aquifer systems in the Trifinio Region, it is intended that the IMS content will be continuously updated and expanded, will be made linked to the GIS database of *Plan Trifinio* that is expected to become accessible through a web portal in the course of 2016.

Presentation of gender data main findings

Ms Francesca Greco (UNESCO-WWAP) presented the gender data main findings. GGRETA is the first ever multi-country and multi-regional water-monitoring project with comparable sex-disaggregated data. It has done so by integrating the United Nations World Water Assessment Programme (UN WWAP) / UNESCO toolkit on sex-disaggregated water indicators and methodology. The toolkit captures quantitative and qualitative data on water and gender issues, providing the baseline for gender sensitive decision making in the water sector, with a view to promoting gender equality; a UNESCO priority. It includes:

- a list of high-priority gender–sensitive water indicators covering water governance, safe drinking water, sanitation and hygiene, decision making and knowledge production, international water resources management, and income generation for agricultural uses,
- a proposed methodology for collecting sex-disaggregated data from transboundary, national, local, household, and intra-household level,
- a compilation of guidelines for data gathering in the field,
- a tailor-made questionnaire for practitioners to collect sex-disaggregated data.

The project has been an important catalyst in promoting and raising gender issues in all GGRETA countries. GGRETA's approach in conducting a thorough data collection and analysis of existing national statistics at the aquifers' level served as an impetus to raise experts' awareness of the importance of gender in the water sector. The mere fact of integrating gender into the activities of the project largely contributed to attracting the attention of national parties (authorities and experts) to the subject. Obtained results will be useful for the formulation of informed decisions on water resource management, use and access in the areas of interest of GGRETA. The sex-disaggregated data overview will also prove the importance to get such data on a global scale, in view of the 2030 Agenda for Sustainable Development the monitoring of the Sustainable Development Goals (SDG) strategy. Additionally, the gathered empirical data and professional analysis could further strengthen the case for gender equality in presentations to regional, national and local stakeholders.

The gender assessment has evidenced the scarcity of relevant data not just for groundwater, but also for water in general in all GGRETA countries. Although there are marked differences among the three pilot cases in gender policy settings, political reforms and improving legislation have increased women's empowerment, including access to land and trainings, especially in the Trifinio countries. It has been noted that training programmes and stakeholder consultations are crucial to establish sex-disaggregated data collection protocols, and to serve as a basis for advocating change towards gender equality and women's empowerment. Common characteristics in the three pilot cases highlight that gender inequality tends to be higher in rural areas, especially when it comes to decision-making processes for irrigation as more than 80% of decisions are taken by men. Women representation in cooperatives and farmers' association is also low and generally does not exceed 20%. A similar trend for decision-making seems to be true at household level, except for decision-making on water use and monitoring –that is where women dominate. At national and international level, although there isn't any policy on equal representation, there seems to be no discrimination of women's opinions in water policy decision boards for highly skilled and educated women. Systematic application and collection of sex-disaggregated data will facilitate a more comprehensive, methodological quantitative gender analysis for policy making.

Water cooperation workshop results

UNESCO-IHP has applied the From Potential Conflict to Cooperation Potential (PCCP) programme approach as a platform to facilitate multi-level and interdisciplinary dialogues in order to foster cooperation in GGRETA countries. The programme follows the rationale that although transboundary water resources can be a source of conflict, their joint management can be strengthened and even used as a mean for further cooperation. PCCP demonstrates that a situation with undeniable potential for conflict can be transformed into a situation where cooperation potential can emerge.

GGRETA project has taken the lead in offering capacity-building programmes in water diplomacy and law to introduce practical advances to stakeholders, decision-makers and law practitioners, in order to strengthen their understanding of the ultimate benefits of joint management of (ground) water resources. The purpose of such an approach is to transform different visions both on national and international level into a common agreed framework, that equitably allocates not only the water resource, but the benefits derived from it. Considering that new trends and possibilities for a more efficient use and management of the aquifers' resources require collaboration and dialogue between decision makers, scientific experts and other stakeholders, GGRETA water diplomacy track was a means to promote transboundary aquifer management by tackling three main components described as follows:

- *Trust-building:* Stakeholders mapping, identifying issues and interests;
- *Capacity-building:* Trainings on water diplomacy (multi-level governance, stakeholder linking), international and domestic water law and gender);
- *Consensus-building:* Exercises aimed at providing a better understanding of water cooperation benefits at national (e.g. Governments, Diplomats) and local level (e.g. Farmers). In Stampriet case study, for instance, other activities included an inventory and analysis of models for the setting up of Multi-Country Cooperation Mechanisms (MCCM).

In addition, UNESCO has concentrated on building skills to bring competing interests and institutions together to craft workable solutions by the means of preventive diplomacy and alternative dispute resolution. Hence, through carefully crafted simulation exercises and interactive lectures, stakeholders in all GGRETA countries gained skill and knowledge on:

- The understanding of needs;
- Negotiation, mediation, and facilitation techniques;
- The necessity of multi-level and interdisciplinary dialogues at domestic and international level.

As a result, the project has also allowed a general positive shift towards transboundary groundwater cooperation. Yet, GGRETA countries need to strengthen their capacity to internalize benefits of cooperation. The conventional approaches of moving from positions to counter positions proved to be less efficient, whereas, the identification of the interests or needs as a base for the development of solutions has been identified as one of the essentials. Parties actually have to educate each other in their interests, and thus become re-educated in their own interests in the process. In this connection, in order to foster chances of cooperation it is desirable that the stakeholders in all GGRETA countries gain skills on:

- Identification and understanding of needs and interests,
- Negotiation, mediation, and facilitation techniques,
- Conducting and initiating multi-level and interdisciplinary dialogues on domestic and international level

Main steering implications for GGRETA project Phase 2

Following the announcement of the approval of GGRETA project Phase 2 and the presentation of GGRETA project Phase 1 main outcomes (see Section above) in Day 1, Ms Alice Aureli (Chief of Section, Groundwater Systems and Settlements, UNESCO-IHP) presented in Day 2 the three main lines of action for GGRETA project Phase 2 which were generated based on inputs and consultations with Countries:

Outcome 1 – Improved resource knowledge and monitoring based on recognition of the importance and vulnerability of transboundary groundwater resources.

Outcome 2 - Enhanced cross-border dialogue and cooperation based on development of shared management tools, and recommendations for governance reforms focused on improving livelihoods, economic development, gender equality and environmental sustainability.

Outcome 3 – Improved capacity in groundwater governance, hydro-diplomacy and gender, and effective communication aiming at replication of project experiences and approaches.

Ms Alice Aureli (UNESCO-IHP) informed participants that an inception meeting for GGRETA project Phase 2 would be held in May 2016[2] to discuss and agree on activities under each outcome. Parallel sessions for each case study were then held to receive feedback on the finalization of GGRETA project Phase 1, guidance and recommendations for GGRETA project Phase 2 from Government

[2] Tentative date

Officials, Permanent Delegations to UNESCO, representatives of regional organisations and technical teams.

Parallel sessions – Stampriet, Trifinio and Pretashkent case studies working groups

- **Pretashkent**

The working group discussions focused on the areas and general directions proposed by Ms Alice Aureli (UNESCO-IHP) for the implementation of GGRETA project Phase 2. Participants fully endorsed the presented outcomes and considered them as topics of high importance to Kazakhstan and Pretashkent area at large. Recommendations from participants on activities to be undertaken under each outcome are provided as follows:

1) Outcome 1 – Improved resource knowledge and monitoring based on recognition of the importance and vulnerability of transboundary groundwater resources:

GGRETA project Phase 2 should provide further assessment of technical and socio-economic aspects in order to fill existing data gaps. Technical studies could focus on the shallower aquifers in the Pretashkent aquifer area, on the development of a mathematical model of the Pretahskent aquifer, and on the continuous update of data to the IMS (e.g. water abstraction and quality time series). Participants also highlighted the need to focus on new studies on the sources and amount of water abstraction, needs, and practices of groundwater consumers. This should be followed by dissemination of information and training on the rational use of groundwater in rural areas. The project should assist governments in creating a national database of water consumers of the TBA in both countries – based on at the carefully crafted surveys.

2) Outcome 2 - Enhanced cross-border dialogue and cooperation based on development of shared management tools, and recommendations for governance reforms focused on improving livelihoods, economic development, gender equality and environmental sustainability.

Participants agreed that water diplomacy and governance should be a pillar of GGRETA project Phase 2 Outcome 2 activities. This could include training of technical specialists (hydrology, hydrogeology, geography and related subject) on water governance, water law and hydro-diplomacy. Regional seminars involving governments and agencies from neighbouring countries on topics deriving from the water-food-environment-energy nexus could be organized to promote cross-border dialogue and cooperation. Finally, it was also envisaged that scientific independent research (e.g. publication in international journals) could guarantee indirect exchange of reliable data and information.

3) Outcome 3 – Improved capacity in groundwater governance, hydro-diplomacy and gender, and effective communication aiming at replication of project experiences and approaches.

Participants expressed the need to strengthen stakeholders' capacity (especially for technical specialists and water consumers) on domestic groundwater governance, legal aspects of groundwater resource management, water diplomacy, and gender issues (focusing on trainings for the collection of sex disaggregated data). This should be followed by dissemination of information on the rational use of groundwater in rural areas (e.g. water savings, improvement of current practices, development of effective low-water-use approached in industry and agriculture).

- **Stampriet**

Participants of the working group expressed their satisfaction and appreciation for the progress made by the GGRETA project Phase 1 in improving the knowledge, and on identifying existing data gaps on the Stampriet Transboundary Aquifer System (STAS). The three Countries confirmed their support, participation and commitment on the further phase of the GGRETA project. The working group discussions covered three main topics, as follows:

1) *Finalization of the Stampriet assessment report:*

Participants agreed on the workplan to finalize the Stampriet assessment report (Table 1). It was decided that additional information should be included to the first final draft of the assessment report that was submitted to Countries earlier in December 2015. A revised final draft report should be shared by UNESCO-IHP to Countries by 10 January 2016. The three Countries will scrutinize and provide detailed comments on the report not later than 24 January 2016. UNESCO-IHP would then incorporate all the comments in the report and send back a final version of the report by 7 February 2016. Countries would then give their endorsement by 14 February 2016 for final printing.

Table 1 – Workplan for finalization of the Stampriet assessment report

Task	Responsible	Deadline
Final draft report shared with Countries.	UNESCO-IHP	10 January 2016
Detailed comments on final draft report from Countries received by UNESCO (submitted by national coordinators)	National experts (to review text) National coordinators (to compile comments and submit to UNESCO)	24 January 2016
Revised final draft report shared with Countries	UNESCO-IHP	7 February 2016
Response on final report clearance and endorsement	National coordinators	14 February 2016
Report edited, printed and distributed	UNESCO-IHP	26 February 2016

2) *Data to be uploaded to the Information Management System (IMS):*

By 10 January 2016, UNESCO-IHP will provide Countries with a list of data (maps, tables, etc…) that has been uploaded to the IMS (private view – currently accessible only to Countries). Countries will then decide on what data should be put on public or stay in private view. It was decided that all the information approved on the assessment report will be for public view, and that all other information should be specifically approved by Countries before going public.

3) *Presentation of Multi-Country Cooperation Mechanisms models:*

Two models of Multi-Country Cooperation Mechanisms were presented to Government Officials, Permanent Delegations to UNESCO, representatives of regional organisations and technical teams. Clarification on key points such as the core mandate, structure, legal arrangements and ramifications, advantages and disadvantages of each model was given to Countries. Government Officials of the agencies responsible for water management in Botswana, Namibia and South Africa decided to further scrutinize the presented models internally.

4) *Recommendations for GGRETA project Phase 2*

Participants discussed about potential activities for GGRETA project Phase 2 along the outcomes presented by Ms Alice Aureli (UNESCO-IHP). It was agreed that activities under each outcome will be further developed as per country's need, without limiting to GGRETA project Phase 2 funds, but also considering co-funding from Countries and existing SADC projects.

- **Trifinio**

Participants of the working group expressed their satisfaction and appreciation for the results of the GGRETA project Phase 1. The paramount result of the project is that GGRETA project Phase 1 geological and geophysical surverys have enabled to delineate the Trifinio aquifer, and revealed that this aquifer is in fact composed of two aquifers that are not connected hydraulically: one in the Valle de Esquipulas (Guatemala) and another one in the Valle de Ocotepeque-Citalá (shared by El Salvador and Honduras). The *Rio Lempa* (Lempa River) is involved in the processes of recharge and discharge of both aquifers and consequently establishes a link between them. Only the aquifer zone in the Valle de Ocotepeque-Citalá is transboundary, shared between El Salvador and Honduras. Thus, GGRETA project Phase 2 will only focus on the latter aquifer.

Participants of the working group expressed their satisfaction and appreciation for the progress made by the GGRETA project Phase 1 in improving the knowledge, and on identifying existing data gaps on groundwater resources in the study area. It was recognized that the project permitted establishing an excellent cooperation at technical level. However, more attention should now be paid at the political level in the further phase of the project. The project also allowed identifying weaknesses in Countries domestic legal and institutional framework, that need to be addressed in order to pave the way towards transboundary governance. Recommendations from participants on activities to be undertaken under each outcome are provided as follows:

1) Outcome 1 – Improved resource knowledge and monitoring based on recognition of the importance and vulnerability of transboundary groundwater resources:

Improving technical knowledge on the aquifer should include fieldwork and research in order to gather additional information, filling the gaps, refining the indicators and improving the conceptual

model of the Ocotepeque-Citala aquifer (El Salvador/Honduras). Participants expressed the wish to also explore other aquifers in the region such as the Ostúa-Metapan aquifer and other fractured aquifers located in the area.

2) Outcome 2 - Enhanced cross-border dialogue and cooperation based on development of shared management tools, and recommendations for governance reforms focused on improving livelihoods, economic development, gender equality and environmental sustainability.

Improved dialogue, analysis, exchange of information and cooperation between countries sharing groundwater resources would imply a greater involvement of political actors and efforts of the project to produce more impact in the area. Many of the new actions to be undertaken in GGRETA project Phase 2 should entail a more formal framework and contacts with the Ministries of Natural Resources, Environment and Foreign Affairs, as well as legislative bodies. GGRETA project Phase 2 should support Countries, organizations and local communities in the identification of potential areas for dialogue and possible models to formalize the cooperation between aquifer institutions towards a joint management. All actions must have the support, involvement and participation of the Tri-national Trifinio Plan Commission, and Ministries of Agriculture and Education, domestic water supply services, Commission of the Rio Lempa and agencies of forestry, among others.

3) Outcome 3 – Improved capacity in groundwater governance, hydro-diplomacy and gender, and effective communication aiming at replication of project experiences and approaches.

GGRETA project Phase 2 should focus on capacity building activities in El Salvador and Honduras to provide all stakeholders with the necessary skills to consider mechanisms of cooperation. An integrated and coherent capacity-building programme, covering different topics and levels, should be designed and carried out in the project area in order to enable local actors to move from knowledge to action. Modules should include technical aspects (hydrogeology, hydrology, etc.), but also legal and institutional aspects (water diplomacy, groundwater governance, inter-sectoral coordination, local legislation and regulatory aspects, international law, etc.), gender and others. The possibility of involving universitites of both Countries in the preparation of training modules should be explored in order to sustain and maintain knowledge within the Countries. The project should also promote capacity building of local authorities (municipal offices) and rural communities in environmental issues and in particular on issues of monitoring; the Ministry of Natural Resources of El Salvador could support the preparation and delivery of training modules.

Given that the Trifinio is a tri-national area by essence and definition; all training activities should also be accessible to nationals of Guatemala, in particular to all members of the Tri-National Groundwater Experts Group that works as advisor of the Plan Trifinio, and to all members of the Tri-National “Mancomunidad” (Commonwealth) of the Rio Lempa. Communication should focus on reach the highest possible degree of awareness of rural communities, political authorities, local institutions and organizations, as well as civil society at large in the Trifinio region on the strategic importance of groundwater to improve the resilience of populations to climate variability and global climate change.

Appendix 1 – GGRETA Phase 1 Final Meeting Agenda

DAY 1 • Tuesday, 15 December 2015 - Room XIV (Miollis Building)

Objectives

- **To present the first phase of GGRETA project main findings;**
- **To underpin the role of science in decision making in the context of transboundary aquifer cooperation;**
- **To discuss the role of emerging legal instruments in the management of transboundary aquifers;**
- **To explore the value of water and the role it plays in transboundary aquifer cooperation.**

09:30- 12h30	**Morning session *(Room XIV, Miollis Building)***
09:30-10:30	**Opening of the meeting**
	Chair of the session: ▪ *Ms Alice Aureli, Chief of Section of Groundwater Systems and Human Settlements, UNESCO International Hydrological Programme (UNESCO-IHP)* • **Welcome remarks** ▪ *Ms Blanca Jiménez-Cisneros, Director of the Division of Water Sciences, Secretary of the International Hydrological Programme, UNESCO* • **Opening Statements** ▪ *H.E. Ms Frieda Nangula Ithete, Permanent Delegate of Namibia to UNESCO, Presidency of the 38th UNESCO General Conference, Ambassador* ▪ *H.E. Mr Jean-Frederic Jauslin, Permanent Delegate of Swiss Confederation to UNESCO, Ambassador* • **Statements by Delegates of the Project Countries** ▪ *H.E. Ms. Lorena Sol de Pool, Permanent Delegate of El Salvador to UNESCO, Ambassador* ▪ *H.E. Mr Marco Tulio Chicas Sosa, Permanent Delegate of Guatemala to UNESCO, Ambassador* ▪ *H.E. Mr Roberto A. Ramírez Aldana, Permanent Delegate of Honduras to UNESCO, Ambassador* ▪ *Mr Satybaldy Bursahkov, on behalf of H.E. Mr Nurlan Danenov, Permanent Delegate of Kazakhstan to UNESCO, Ambassador* • **Introduction of the participants and adoption of the agenda**
10:30-10:45	***Coffee break***

10:45-11:45	**Statements from National and Regional Authorities**
	Chair of the session: ▪ *Youssef Filali-Meknassi, UNESCO Windhoek* ▪ *Mr Obolokile Obakeng, Deputy Permanent Secretary, Ministry of Minerals, Energy and Water Resources, Focal Point for the UNESCO-IHP National Committee, Botswana* ▪ *Ms Maria Amakali, Director: Water Resource Management, Department of Water Affairs and Forestry, Ministry of Agriculture,* Water *and Forestry, Namibia* ▪ *Mr Phera Ramoeli, Director, Water Division Infrastructure and Services, Southern African Development Community (SADC)* ▪ *Mr Khahliso Leketa, Orange-Senqu River Commission (ORASECOM)* ▪ *Ms Celina Mena, Ministry of Environment and Natural Resources (Ministerio de Ambiente y Recursos Naturales, MARN), Focal Point for the National Committee for UNESCO-IHP, El Salvador* ▪ *Mr Rolando Alberto, Trinacional Technical Director, Representative of Plan Trifinio* Discussion
11:45 – 12:30	**Presentation of the "Groundwater Resources Governance in Transboundary Aquifers (GGRETA)" project**
	Chair of the session: • *Mr Youssef Filali-Meknassi, Science Programme Specialist, UNESCO Office in Windhoek* • Objectives and Main achievements ▪ *Ms Alice Aureli, UNESCO-IHP* • Multidisciplinary Assessment Methodology and GGRETA Information Management System (IMS) ▪ *Mr Neno Kukuric, Director, UNESCO Category 2 Centre, International Groundwater Resources Assessment Centre (IGRAC)* • Assessment of legal and institutional TBA frameworks ▪ *Mr Stefano Burchi, UNESCO-IHP* Questions and Answers
12:30-14:30	***Lunch***

14:30-17:30	**Afternoon session *(Room XIV, Miollis Building)*** **Chair of the session:** ▪ *Youssef Filali-Meknassi, UNESCO Windhoek*
14:30-15:30	**Presentation of the "Stampriet Transboundary Aquifer System (STAS)" case study main findings**
	• Results of the aquifer multi-disciplinary assessment ▪ *Mr Piet Kenabatho, Assessment Report Coordinator, University of Botswana* Discussion
15:30-16:30	**Presentation of the "Trifinio Aquifers Complex" case study main findings**
	• General context of the case study and groundwater governance issues ▪ *Mr Andrea Merla, Senior Advisor, UNESCO-IHP* • Results of the different components of the multi-disciplinary aquifer assessment ▪ *Mr Carlos Rosal, Local Case Study Coordinator , International Union for the Conservation of the Nature (IUCN)* Discussion
16:30-17:00	***Coffee break***
17:00-17:30	**Reactions to GGRETA project findings**
	Chair of the session: ▪ *Youssef Filali-Meknassi, UNESCO Windhoek* Reactions to GGRETA project findings and way forward: • General discussion and feedback Discussion Closing remarks of the day ▪ *Alice Aureli, UNESCO-IHP*
18:00 - 19:30	**Cocktail – All participants *(Room Ségur, 7th Floor Fontenoy Building)***

DAY 2 • Wednesday, 16 December 2015 - Rooms XIII, XIV, XV (Miollis Building)

Objectives

- **Plenary session: Presentation of the main objectives of the proposal for GGRETA second phase**
- **Parallel sessions: Discussions among members of the Permanent Delegations to UNESCO, government officials, representatives of regional organisations and technical teams - feedback about GGRETA first phase , guidance and recommendations for second phase**

9:30-10:10	**Presentation of the "Pretashkent Aquifer" case study main findings**
	• Overview of the multi-disciplinary aquifer assessment ▪ *Mr Suren Gevinian, Case study Coordinator, UNESCO-IHP* • Results of the different components of the multi-disciplinary aquifer assessment in Kazakhstan ▪ *Mr Oleg Podolny, National Coordinator, Kazakhstan* • Benefit sharing and lessons learnt ▪ *Ms Valentina Salybekova, Case study Expert, Kazakhstan* Discussion
10:10-10:30	**Presentation of gender data main findings**
	• Indicator-based gender assessment methodology • Preliminary issues and lessons learnt ▪ *Ms Francesca Greco, Gender and Water Focal Point, UNESCO World Water Assessment Programme (UNESCO WWAP)* Discussion
10:30-10:40	**Preliminary models of Multi-Country Cooperation Mechanisms (MCCM)**
	▪ *Mr Stefano Burchi, UNESCO-IHP*
10:40-11:00	**Water cooperation workshop results**
	▪ *Mr Ralph Mahfoud, UNESCO-IHP*
11:00-11:30	***Coffee break***
11:30-12:30	**Parallel sessions – Stampriet, Trifinio and Pretashkent Case studies Working groups** ***(Rooms XIII, XIV and XV, Miollis Building)***
	• Reactions to the integrated assessment findings of each case study • Recommendations for project's potential next phase • Preparation of a report for the Plenary Session
12:30-14:30	***Lunch***

14:30- 16:30	Afternoon session
14:30-16:30	**Plenary Session - Reactions to GGRETA project and way forward**
	Chair of the session: ▪ *Youssef Filali-Meknassi, UNESCO Windhoek* • Reports from the Rapporteurs of parallel sessions • General discussion and feedback

Parallel sessions – Chairs and UNESCO-IHP support		
Room XIV – Miollis Building	Stampriet	**Chair**: *Mr Youssef Filali-Meknassi* *Support: Ms Fernanda Ferreira De Freitas*
Room XIII – Miollis Building	Trifinio	**Chair**: *Mr Andrea Merla* *Support: Mr Aurélien Dumont*
Room XV – Fontenoy Building	Pretashkent	**Chairs**:*Mr Suren Gevinian and Ms Natalia Kim* *Support: Ms Irina Pavlova*

Appendix 2 – GGRETA Phase 1 Final Meeting list of participants

Permanent Delegations to UNESCO	
H.E. Mr Jean-Frédéric Jauslin	Ambassador, Permanent Delegate of Swiss Confederation to UNESCO
H.E. Ms Frieda Nangula Ithete	Ambassador, Permanent Delegate of Namibia to UNESCO, Presidency of the 38th UNESCO General Conference
Mr Felix Amporo	Permanent Delegation of Namibia to UNESCO
Ms Kgopodiso-Shali Mosinki	Permanent Delegation of Botswana to UNESCO
H.E. Ms. Lorena Sol de Pool	Ambassador, Permanent Delegate of El Salvador to UNESCO
Ms Nanette Viaud Desroches	Permanent Delegation of El Salvador to UNESCO
H.E. Mr Marco Tulio Chicas Sosa	Ambassador, Permanent Delegate of Guatemala to UNESCO
Mr Ricardo Enríquez	Permanent Delegation of Guatemala to UNESCO
H.E. Mr Roberto A. Ramírez Aldana	Ambassador, Permanent Delegate of Honduras to UNESCO
Mr Carlos Maradiaga	Permanent Delegation of Honduras to UNESCO
Mr Satybaldy Burshakov	Permanent Delegation of Kazakhstan to UNESCO

Case studies participants		
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UNESCO International Hydrological Programme (UNESCO-IHP)		
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Mr Vefa Moustafaev	Consultant, UNESCO-IHP	v.moustafaev@unesco.org

[3] Attended via Web Conferencing

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