



6th World Water Forum: Condition for Success 1 – Target 4: By 2015, increase the number of country with water security diagnoses and governance tools, based on existing regulatory and legislative framework and IWRM mechanisms

Condition for success 1 – Good Governance

Synthesis report - Target 4

“IWRM through the lens of water security, adaptive water management and international legal instruments for good governance”

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By 2015, increase the number of country with water security diagnoses and governance tools, based on existing regulatory and legislative (local, national, international) frameworks and IWRM mechanism

This report has been prepared by the CS1 Target and Solution Group 4 coordinated by UNESCO-IHP. It was edited by Lucilla Minelli (L.minelli@unesco.org) and benefited from valuable feedbacks and contributions from the TSG partners, in particular IGRAC and the University of Arizona.



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I. Introduction

This target and solutions group (TSG) seeks to increase the number of countries with water security diagnoses and governance tools, based on existing regulatory and legislative (local, national, international) frameworks and IWRM mechanism by 2015. The TSG will identify, share and promote those existing and innovative solutions that are assumed to successfully lead to an increased implementation of regulations and legislation at various scales and IWRM practices that improve water security and governance aspects of integrated water resources management.

This target will look into definitions of water governance with a critical eye starting from the assumption that there is no one-size fits-all definition for all water problems; several factors (economic, social, environmental, technological, and scientific, etc.) contribute to a variegated overview of challenges and solutions according to different regional contexts in the world. A particular attention will be given to the different characteristics of surface and groundwater. Among others: the Ostrom’s principles, UN Conventions (i.e. UNECE Helsinki Convention, UNCCD, UNFCCC, etc.), Regional instruments such as the European Water Framework Directive and the SADC Water Act., and other non-binding global instruments such as the 1992 Rio Declaration, the UNGA Resolutions (2008 and 2011) on the “Law on Transboundary Aquifers”, etc.

This target will review governance tools in countries that have been successful in implementing innovative and effective mechanisms. A series of concrete experiences and case studies will be presented and illustrated.



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II. Background and rationale of the target

The rationale behind this target starts with the acknowledgement that water resources management is increasingly becoming a complex and an even wicked problem (Pahl-Wost, 2007). Recently, various scholars addressed this complexity and mentioned various underlying factors (Allan, 2003). Some of the more determining factors are that the increasing population size and economic development (with its corresponding consumption patterns) lead to increasingly competing demands for scarce water resources. Because of the size of economies and modern technologies, human activities have increasing negative impacts on natural systems on which ecosystem services humankind and nature depend. The complexity is strongly related with the increased scale at which changes and issues manifest themselves (Hoff, 2009). Increasingly, consequences of human decisions cross boundaries and cover multiple jurisdictions making it more difficult to define and implement sustainable and agreeable solutions. The complexity is also strongly related with the unpredictability of how natural systems like rivers, lakes, aquifers and marine ecosystems are going to behave now that climate change becomes manifest (tipping points, threshold values, domino effect patterns). This complexity (including unpredictability) is affecting people's water security.

During the 2nd World Water Forum in The Hague, the concept of water security was introduced. *Water security involves the sustainable use and protection of water systems, the protection against water related hazards (floods and droughts), the sustainable development of water resources and the safeguarding of (access to) water functions and services for humans and the environment*". The Ministerial Declaration of the WWF₂, entitled 'Water Security in the 21st Century', listed 7 'main challenges' to achieving water security: 1) meeting basic needs; 2) securing food supply; 3) protecting ecosystems; 4) sharing water resources; 5) managing risks; 6) valuing water and 7) governing water wisely. Water security arises at 2 interconnected levels: local/national and regional/international. At the local/national level, the security of access to the resource is the crucial problem. At the regional/international level, the primary concern is about potential international conflicts and tensions resulting from traditional national security approaches with a focus on hydro-sovereignty. Good water governance is pivotal to achieve water security

Water security diagnoses include programs that assess the state and evolution of these 7 main challenges. Such analysis should identify vulnerabilities of users, sectors, geographical areas, and reveal causal relationships between human and non-human drivers and water-related consequences. Such information is a prerequisite for any of the priority actions leading to integrating the three E's (equity, economy and environmental sustainability) in water management. It is obvious that to solve water issues that are so strongly related to the



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allocation (and provision) of scarce water resources and that are so inter-dependent on various scales and between sectors, one needs integrated and holistic approaches. Solutions for such wicked issues rely heavily on smart integration and coordination. IWRM, with its aim to integrate various physical systems and physical systems with social systems, together with Governance, with its aim to integrate decision-making processes across scales and levels in an transparent and inclusive way, appear to be the right combination to tackle these issues.

Recently a number of programs started to have a specific look in the governance aspects of water resources management worldwide. For instance, UNESCO-IHP, FAO, IAH and the World Bank have joined forces and in 2011 initiated a GEF-funded project on Groundwater Governance. Through regional consultations the project aims at preparing a Global Diagnostic on groundwater governance and a Global Framework for Action with clear recommendations that will help countries setting up and implementing good governance tools. Currently all large water events include sessions on the aspect of governance in water resources management.

Governance is assumed to contribute to develop, implement and enforce equitable, efficient and sustainable solutions for allocation, provision and coordination problems. Good governance is assumed to include notions of demand-responsiveness and anticipation, consensus-based, social inclusiveness, effectiveness and efficiency, participation, transparency and accountability and rule of law (OECD, 2011; IMF 2005; UNEP 1997). **This Target aims at specifically addressing the Rule of Law notions of governance.** With *rule of law* is generally meant that independent, efficient, and accessible judicial and legal systems are in place, with a government that applies fair and equitable laws equally, consistently, coherently, and prospectively to all its people.

This TSG addresses legislation and regulations that foster and provide the legal basis for applying water security diagnoses, implementing IWRM-based water management practices as well as various notions of good governance in water resources management. We realize that the set of existing water related regulations and legislation is enormous. Basically it includes all defined, negotiated and agreed upon set of rules that enforce, forbid or permit water activities for various kinds of actors under various conditions and which further specify what happens when people do not comply with those rules. Different rules cover different scales and can be valid only within a small geographical jurisdiction like a state or municipality or for the territory of nation states in case of international agreements. Rules can be informal as it is the case in many collective actions mechanism in isolated communities or formal and codified as with National Legislation. Rules can be binding like the European Water Framework Directive and the SADC Water Act or serve as guiding principles as in the case of the UN-convention of non-navigational uses of international water courses and the Draft Articles on the Law on Transboundary aquifers.

One governance issue related to legislation is its performance. For example, the mere existence of an international agreement between two nation states does not actually ensure that water is allocated consistently with the provisions foresee within the agreement. This



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depends on how the people determining the water demand living in both countries are willing to adhere to it. In this respect it comes down to a coherent relationship between the nested set of rules (Ostrom, 2005) that work on a meta-constitutional level (e.g., the international agreement between states), the constitutional level (e.g. the decision by a governmental agency to designate zones around groundwater dependent ecosystems forbidding groundwater pumping within a country), the collective-choice level (e.g. the decision by a water users association to provide financial incentives for farmers applying water saving techniques) and finally on the operational level (e.g. the decision between two neighboring farmers to share an well).

Two other governance aspects have raised clear attention recently and relate to water use rights and the allocation of water resources at different scales. First, in some countries globalization transferred public water services and water (and land property) rights to foreign state-controlled companies within investment protection systems or special conflict resolution regimes (Solanes and Jouravlev, 2007). These agreements (sometimes deliberately) override national laws and practice and tend to ignore the existence of local customary rights. It restricts the power of governments to act in the public interest and in that of local communities to claim their water rights with their governments. Secondly, it is recognized that besides international lakes and rivers, many (more than 270) aquifers are underlying more than one nation. In order to be able to equitably and sustainably manage these international groundwater resources, international cooperation between countries needs to be encouraged. The International Shared Aquifer Resources Management Initiative initiated by UNESCO-IHP and the IAH with a number of relevant partners is trying to do this explicitly by targeting the issue of international legislation.

This TSG is addressing IWRM which introduced the holistic systems approach integrating various water types together and linking land use to water management. **The water governance consequence of the IWRM concept is that ideally one should have one integrated water law and policy that integrates the various water types and water users. Moreover, national water policies should link with national policies on food security, energy security and climate change adaptation. Additionally, water responsibilities and task should ideally not be fragmented over separated, functional departments and agencies.** To avoid this so-called problem of lateral institutional interplay, at least mechanisms should be in place that allows for interacting between these departments.

A second water governance consequence of IWRM relates to its promotion of the subsidiary principle. This principle states that management of a water resources system should ideally be done at the lowest scale possible. This allows for the generation and implementation of more context-specific solutions supported by local stakeholders. The institutional consequence of this principle is decentralization and devolution of water responsibilities from central governmental authorities to lower order institutions (also non-governmental ones such as NGOs and water users associations). Additionally, IWRM promotes the participation of local stakeholders and specifically encourages the increasing role of women



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in water related decision-making processes. **Mechanisms and rules have to be in place that enable this decentralization to avoid the problem of vertical institutional interplay and that foster public participation especially of women.**

This TSG is also addressing adaptive water management (AWM). AWM builds on IWRM but explicitly takes into account the uncertainty of the future. In order to keep water policies, legislation and proposed water management measures fitted to possibly future changed conditions, constant monitoring and updating is needed. This has consequences for the Rule of Law notion of Water Governance which include detailed rules that refer to very specific and precise and ideally unchanging situations. **Mechanisms need to be in place to allow for constant updating of regulations and legislation when external conditions change.**



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III. Target action plan

CS1 Good Governance - Target 4: "By 2015, increase the number of countries with water security diagnoses and governance tools, based on existing regulatory and legislative (local, national, international) frameworks and IWRM mechanisms"			
TIMEFRAME	IMPLEMENTATION OF THE TARGET Expected results & Indicators of Success	PRACTICAL STEPS Activities to be done	RESPONSIBLE PARTIES
Milestone 1: Assessment of current status, review of existing governance tools and best practices that are based on regulations/legislation and IWRM-principles			



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<p>August 2011- December 2011</p>	<ul style="list-style-type: none"> ▪ Design and validate target + action plan ▪ Present the target to potential interested contributors ▪ meet with the TSG members to discuss further steps ▪ prepare a list of international events where to best outreach our messages and share our recommendations for improving water governance tools by developing, adopting and implementing regulations/legislation and IWRM-principles ▪ collect case studies showcasing best examples ▪ discuss and prepare a list of benefits that derive from good water governance 	<p>IWRA Suez-Environment World Bank's GW-MATE OECD Water Governance Center (WGC) - Netherlands IGRAC Udall Center for Studies in Public Policy - University of Arizona University of Dundee University of Ulster Complutense University of Madrid INBO FAO IAH UNCCD GWP Central America El Colegio de Mexico Organization of American States U.S. Geological Survey GWP Women for Water Partnership GEF AFD IGAD-ISARM IMDEA IUCN Environmental Law Programme Agência Nacional de Águas-ANA, Brazil Water Observatory-Botin Foundation, Spain University of Arizona, USA Governmental Authority for Water and Sewage, Israel Agence de l'eau Loire Bretagne Norway Association for the Development of Micro-La Poza, El Salvador CONAGUA, Mexico Syndicat du Bassin du Lez / Autorité Locale du Département de l'Hérault</p>
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		IUCN IUCN CONAGUA, México GWP Palestinian Water Authority Sri Lanka Water Partnership, Grupo Nova Cartographia, Spain
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Milestone 2 (Two-folded)

- 1 - inputs collected are digested, organized and selected;**
- 2 - a series of best ways to implement best practices is identified**



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2012 - 2013

- identify countries that require more cooperation and are willing to implement good governance tools
- through a series of regional consultations, identify gaps and bottlenecks
- present findings of the work done so far and collect new suggestions and proposals
- Ascertain interest from potential mandated water organisations in various country to explore mechanisms for improving their water governance based upon regulations/legislation and IWRM principles
- Start a phase of outreach and information campaign to provide countries and decision-makers with the most accurate overview of virtuous mechanisms and best practices so to inspire and enable them to make an informed decision on which tools to adopts
- Facilitate the process of sharing knowledge and social learning between water organizations from countries with water governance tools based on regulations/legislation and IWRM with countries that would like to improve their water governance
- Channel the results of the discussions held at the World Water Forum
- Gather inputs on how to best incorporate regional differences into the analysis of governance systems
- Through regional consultations, gather information from the private sector on how to improve the interaction between the public/private and on how a joint effort can lead to good water governance

IGRAC
UNESCO-IHP
MIO-ESCDE
Veolia Environment
UNESCO-IHE
IWRA
Suez Environment
Foundation Chirac
OAS
AMCOW
INBO
OECD
FAO
IAH
UNCCD
UNECE
GWP
OSS
UNILC
Water Governance Center - The Netherlands
EU Commission, DG Environment
Multiple Universities
Multiple Geological Surveys Centers
Multiple Basin Organizations



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Milestone 3: By 2015 a relevant number of countries have been informed about efficient tools of good governance and decision makers are able to make "informed decisions". Also a relevant number of countries have put in place mechanisms that foresee the use of such tools

<p>2013-2015 *7th World Water Forum</p>	<ul style="list-style-type: none"> ▪ Largely disseminate the results of the work done ▪ Continue reaching out countries and decision makers to provide them with the necessary information on what are the best tools (according to each specific context) for sustainable water management 	<p>IGRAC UNESCO-IHP MIO-ESCDE Veolia Environment UNESCO-IHE IWRA Suez Environment Foundation Chirac OAS AMCOW INBO OECD FAO IAH UNCCD UNECE GWP OSS UNILC Water Governance Center - The Netherlands EU Commission, DG Environment Multiple Universities Multiple Geological Surveys Centers Multiple Basin Organizations</p>
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IV. Solutions

Justification for selection of solution for the session by the TSG

The method considered by the TSG for the selection of solutions to be presented and discussed in the session of Target 4 has resulted in the identification of eight prominent solutions that respond to general criterion of geographical representation, originality of solution and the success of their implementation (when applicable), among other factors.

These eight solutions will be briefly presented orally in the first part of the session in a panel format. A more interactive format has been chosen to present the remaining solutions in the second part of the session which will foresee roundtable discussions. Each table will discuss and debate one of the solutions proposed among the group and will afterwards report the recommendations or suggestions aroused in the discussions in an interactive manner. This format ensures the participation of all the Institutions that have contributed to the Target and submitted solutions.

The eight solutions identified for oral presentations are the following:

- Solution # 3: Water banking across regions over time (REGIONAL), University of Arizona, USA
- Solution # 5: Integrated Water Resources Management Approach in the Israeli National Water Policy (NATIONAL), Governmental Authority for Water and Sewage, Israel
- Solution # 15: Improving national and transboundary water governance capacity (GLOBAL), IUCN
- Solution # 23: Associativity for achievements in IWRM in the Rio Naranjo basin (LOCAL), GWP
- Solution # 26: ISARM: facilitating regional processes towards joint management of shared aquifer resources (REGIONAL), IGRAC
- Solution # 32: Global Framework of Action for Groundwater Governance (GLOBAL), Groundwater Governance Project (FAO – GEF IW – UNESCO-IHP - IAH – WB)
- Solution # 40: Guarani Aquifer System (GAS): from scientific knowledge to good governance, International Association of Hydrogeologists, Brazil
- USGS

Complete list of solutions submitted

Solution # 1 : The Highland Water Forum: a multi-stakeholder dialogue for sustainable groundwater management (NATIONAL)

The Ministry of Water and Irrigation, supported by The German-Jordanian Water Programme, has therefore established the Highland Water Forum, which seeks for strategic options a and



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partnerships to reduce agricultural water abstraction in the Highlands in a socially compatible way that avoids major losses for the agricultural sector, offers alternatives for the rural society, and, hence, prevents major differences with the affected farmers, workers, and landowners. The Ministry of Water and Irrigation aims to reach an action plan for sustainable management of groundwater, which complements the Jordanian Water Strategy 2008-2022. The Highland Water Forum consists of 60 stakeholders from the agricultural water users, government institutions and NGOs and research institutions. The Core Group has met 6 times and produced a recommendation paper about groundwater laws and regulations. The Secretariat consists of 5 staff members from different organizations working in the water sector; namely Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the J Jordan Hashemite Fund for Human Development (a local J Jordanian NGO) and the French Embassy in Jordan. The Steering Committee consists of 15 members from governmental organizations, the donor community, one Jordanian NGO, and a university and research center. The Highland Groundwater basins, particularly the Amman-Zarqa and the Azraq Basins, are heavily overused, exceeding the safe yield by 176% and 215% MCM (MWI, 2009).

Solution # 2: Groundwater accounting at a country level (NATIONAL)

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The study provides a comprehensive picture of groundwater uses and its economic value at a country level (over 700 groundwater bodies). It also shows the role of groundwater irrigation and its economic significant compared to surface irrigation. The analysis of the economic value of water is undertaken at a municipality level and over the period 2000-2008, thus allowing for spatial and temporal trends to be identified. This study is supported by an overview of the characteristics of the Spanish groundwater resources (available resources, and their qualitative and quantitative status), based on data collected by the River Basin Authorities as part of the water planning process undertaken under the European Water Framework Directive. The project was initiated by the Water Observatory of the Botin Foundation in collaboration with the Spanish Geological Service (IGME). Both organizations were involved since the onset of the project. The Water Observatory took care of the water accounting and estimation of the economic value of groundwater uses, while IGME was in charge of providing an overview of the available groundwater resources and their status, mainly using the information collected for the new Spanish River Basin Plans. This solution could be implemented for any country with a good level of groundwater-related data availability. The key outputs produced by this solution are data to inform decision-makers and scientists. A clear indicator of success would be the decision by the Spanish Ministry of Agriculture and Environment to elaborate a Groundwater White Book (the former one was published in 1995). Another indicator of success would be that the same Ministry decides to: revise and upgrade the existing databases about water sources and irrigated land at a country level, commit to keep the results of this solution updated and accessible to the public and to implement a centralized webpage where any citizen can access almost “real time” data about the status of groundwater.

Solution # 3: Water banking across regions over time (REGIONAL)

Sharon B. Megdal,



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The case study highlights collaborative sharing of river water through two different storage approaches: underground storage across states and surface storage across countries. Within the U.S. state of Arizona, a multitude of water using stakeholders, including cities and agricultural districts, initiated the Arizona water banking program. This program has been successfully in effect since 1996 and has allowed agriculture to use surface water instead of fossil groundwater supplies and storage of water for future municipal uses. This example shows how innovative statutory and regulatory programs can be developed to address water supply problems. The Arizona water banking was authorized by new state-level legislation and the formation of a water banking authority. Interstate banking was enabled by new federal regulations as well as agreements between water districts and across states. The U.S. government has adopted regulations allowing for these interstate cooperative agreements. These water banking examples demonstrate how the federal government, states and water districts have worked together to allow for the banking of surface water underground for later recovery, sometimes through agreements to forebear taking river deliveries in the future. Due to the April 2010 earthquake in Mexico, which destroyed infrastructure that delivers Colorado River water to Mexican farmers, the U.S. and Mexico agreed to allow Mexico to store water in Lake Mead for future delivery. This was accomplished through a Minute to a Treaty, which is something that is signed by the U.S. and Mexican Commissioners of the International Boundary and Water Commission (IBWC). The solution did not require approval of the two federal congresses. These solutions reflect collaborative problem solving and were enabled by a combination of modifications to laws, regulations, and historical practices.

Solution # 4: Policy dialogues and communities of practice (REGIONAL)

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This solution aims to establish a dialogue between scientists, stakeholders, and decision makers. These are known as communities of practice and can be created via development projects, research efforts, or issue-driven processes. The resulting dialogues include the full spectrum of water-related subjects--including data acquisition, processing, and access; scientific research; community input; institutional and decision maker involvement, and improved information flows to all parties. This solution is located in the arid Americas--i.e., parts of western Canada, the southwestern United States, Mexico, the Andean deserts of South America, and dry northeastern Brazil. The leading actors have been university researchers, government agency personnel, and community and NGO groups such as: The Inter-American Institute for Global Change Research (IAI), the University of Arizona, the Universidad Pontificia de Chile, the University of Buenos Aires, and other American universities. Funding from IAI, NOAA (U.S.), NSF (U.S.), Conycet (Chile), Conacyt (Mexico) and other organizations have kept the initiative alive. The initiative is being pursued via a virtual effort called Aquasec (Aquasec.org)



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Solution # 5: Integrated Water Resources Management Approach in the Israeli National Water Policy (NATIONAL)

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During the last decade the decision makers in Israel came to understanding that the only possible way to cope, on one hand, with the natural water shortage, and on the other, with growing population and quality of life standards, is to adopt and implement as the national policy the Integrated Water Resources Management approach. As a result of two years period legislation process, the Governmental Authority for Water and Sewage was established (1 January 2007), replacing the organ of Water Commission and gathering gradually all regulatory bodies acting in the water aspects under one roof. The main purpose of the reform was to enable the Authority implementing an integrative management of the whole "Water Chain" and to transfer authorities from the political level of several ministers to one professional Board. Today the Water Authority of Israel is in charge of management and regulation of the Water Sector in Israel, by implementation of the Water Law in all its aspects, such as:

- a. To allocate water resources, to ensure the optimal use and to fulfill the needs of the various sectors and to enable the further development of the country.
- b. To preserve and protect the existing natural water reserves, in quality and quantity.
- c. To plan and develop the National Water Sector.
- d. To set water tariffs and levies to all sectors: domestic consumers, urban uses, agriculture, industry and other.
- e. To set regulation norms and directives for water supply to end users, to municipal water companies and to "Mekorot" – Water National Company (Bulk Supplier).
- f. To ensure the reliable supply of all the potable water increasing needs, including through seawater desalination.
- g. To advance the sewage treatment up to the level adequate to unrestricted uses in agriculture; treating and using low quality water (brackish, flood water) for irrigation replacing potable water.
- h. To promote water saving policies and activities on a national scale.
- i. To strengthen cooperation between the water authorities in the region through formal and informal frameworks, including the multilateral water group of the Peace Process and bilateral venues. Advancing common solutions for water problems and sharing knowledge and training.

Solution # 7: Integrated Management Plan in the Arghane watershed. Taroudant province, Morocco (LOCAL)

As one of the most important regions of Morocco, the Souss Massa Drâa region has great agricultural, touristic and economic potential but one of its biggest constrain is water availability. The balance between supply and demand remains very fragile. The Souss Massa Drâa region established an Integrated Management Plan for the Arghane Basin (Schéma d'Aménagement et de Gestion Intégrée de l'Eau du Bassin Hydraulique d'Arghane - SAGIE) and promoted synergies between all stakeholders (public, private and civil society) from the



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creation process to the implementation. The SAGIE established water resources development scenarios and an implementation calendar for a Resources Development and Preservation Action Plan. The Action Plan was accompanied by necessary institutional engagements and measures for its effective implementation (particularly organizational aspects). This Souss Massa Drâa case study must become an example of governance and public participation good practice for Morocco and the rest of the world.

Solution # 8: Facilitating dialogue among stakeholders: The Interbasin Compact Committee in Colorado, USA (LOCAL)

While various administrations have sought to craft a state water plan, no attempt sought to take the best aspects of local control and charge the diverse interests themselves with the job of creating a statewide vision, until 2005, when Russ George, as Director of the Colorado Department of Natural Resources, with the Colorado General Assembly created the Interbasin Compact Committee (IBCC). A 27-member committee, the IBCC, was formally established by the Colorado Water for the 21st Century Act with the express goals of facilitating conversations and dialogue on water among stakeholder in each of Colorado's river basins, broadening the range of stakeholders actively participating in the state's water decisions, creating a locally driven process to address statewide water issues, and creating a statewide vision of how we could share our increasingly limited water resources. Beginning in 2007, Director Sherman and the members of IBCC began to explore developing a shared vision for Colorado's water future. The IBCC has been working to develop and understand the implications of different combinations of strategies or "portfolios" of water supply to meet future water needs. Over the past year, the IBCC has sought to agree upon one or two portfolios for the mid-demand/mid-supply scenario. They have also begun working to develop frameworks by which any particular portfolio would actually be implemented. Currently the portfolio and framework development are an iterative process.

Solution # 9: Public Participation in Water Management at Basin Level in France (LOCAL)

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Agence de l'eau Loire Bretagne

Within the framework of the development of the plan for water quality recovery on the Loire Brittany Basin, (River Basin Management Plan RBMP), the Basin Committee has been consulting the public on the important questions for water on two occasions: during the phase of inventory and on the RBMP itself, before final validation. The Loire Brittany Water Agency mobilizes a network of actors on its territory to inform and mobilize the public around this management plan. For all this, the Agency has been giving educational tools, has been animating a network of partners, has organized exchanges and a mutualisation of teaching practices, has financially supported pilot actions, and has created a website to sensitize the general public. The whole of the territory of the Loire-Brittany basin, 155,000



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km², 28% of the metropolitan French territory, 10 Regions, 36 departments and more than 7300 communes for 12 million inhabitants. The solution has been implemented for all of France. A new cycle of public information is under preparation.

Solution # 10: Bridging the gaps – holistic and local water governance (LOCAL)

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The Morsa catchment, 690 km², is located in the South-East of Norway between the Oslofjord and river Glomma dominated by agriculture and forest. It includes 8 municipalities, 2 counties and 40,000 inhabitants. The catchment is covered by marine sediments, has several lakes and a hydrology characterized by peak runoff events during autumn and winter periods. The Morsa cooperative work started in 1999 on an initiative from the four municipalities in the Vansjø water catchment, Våler, Moss, Rygge og Råde. In addition these municipalities managed to also include the four up-stream municipalities, regional authorities and the farmers unions in the two counties Østfold and Akershus for a joint effort for lake Vansjø which was in a poor condition. Vansjø is a unique recreational area and in addition drinking water reservoir for 60.000 people in the region of Moss as well as a reserve drinking water reservoir for the towns Sarpsborg and Fredrikstad. The Morsa River has in the past had a lack of a central management structure for the river basin. Morsa was the first type of cooperation in the river building on consensus and a common knowledge-based structure for decisions across sectors and across municipality and county borders. The water quality problems linked to lake Vansjø have been a major concern for decades. During Morsas 12 years, excessive mitigation actions have been implemented. Registration of 2300 households in rural areas showed that most of the wastewater treatment plants were insufficient. A program of upgrading was proposed and is now almost completed resulting in a reduction of 1.8 t of P to the lakes for a cost of NOK 400 mill. Earmarked grants from the Norwegian State Housing Bank have been important incitements. The Morsa model is being recommended as a good example on how to organize water management at local water catchment level in Norway.

Solution # 12: Promoting watershed preservation through community involvement: The case of the Micro-La Poza community (NATIONAL)

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This is a success story about community involvement in watershed preservation in the La Poza basin of El Salvador. In a region marked by deforestation, a local foundation provided outreach to the public and decision makers on the need to improve conservation of natural resources and demonstrated the value of investing in watersheds and the environmental



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services they provide. Other actions included community meetings, soil conservation projects and the establishment of a payment fund for environmental services.

Solution # 13: Irritila Project, Payment for Environmental Services with Action Involving (LOCAL)

Pedro Ulises Carranza González

CNA (National Water Commission) and CONAFOR (National Forest), Mexico

This case study describes how a group of people in Mexico's Laguna region created a financial mechanism – requesting voluntary payments from water users – to provide funds for the protection of forests and their inherent environmental services. Actors involved in this Project included users of local water resources, including surface water, groundwater and household drinking water.

Solution # 14: Global and Joint Management of Water on the Lez Watershed (LOCAL)

Geraldine VACQUIER and Serge MIQUEL

SYBLE (Syndicat du Bassin du Lez) and Autorité Locale du Département de l'Hérault

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This case study provides details on a comprehensive tool (known as SAGE) for surface and groundwater management based on the principles of balanced and collective water resources and aquatic environments. The tool conceived for use in France's Lez watershed, employs a cross-system approaches, including rivers, ponds, and marine environments and allows users to address the challenges of flooding, pollution and human pressures. Actors included SYBLE (Syndicat du Bassin du Lez), the local water commission of the SAGE-Lez-Mosson Palavas Ponds, water parliaments at the watershed level, elected officials, the French government, water users, and local associations.

Solution # 15: Improving national and transboundary water governance capacity (GLOBAL)

IUCN

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This case study provides an overview of the IUCN Water and Nature Initiative (WANI) and its work to establish political will and good governance in order to avoid and mitigate conflict and to build collaboration and consensus among all stakeholders on the basis of informed participation. The IUCN WANI sets up demonstrations sites in river basins all across the globe where nature conservation and integrated management of land and water resources has



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been combined with establishing the required institutional, legal and economic frameworks. Actors involved in these demonstration projects include governments, NGO's, civil society organizations, and local communities.

Solution # 16: River Basin Management Initiatives supported at Goascorán River (REGIONAL)

IUCN

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There is a Binational Management Committee in the Goascorán River that developed a management plan for the basin; however it hasn't reach its full potential because it focuses its work only at the local level. Therefore IUCN and Fundación Vida have been working with stakeholders in order to re activate and empower the binational committee as well as to update the management plan in order to achieve its implementation. The final objective of this solution is to see a beneficial process of sustainable development being applied in the basin by both countries. The Goascorán River Basin has a superficial extension of 2.345,5 Km² and it is shared by Honduras and El Salvador. Due to its location and natural resources, the river basin is an important territory in terms of environment, economics and geopolitics. This solution contribute to the target because the committee is an existing structure with a good local base, and it is being supported in order to involve stakeholders at all levels in the river basin management; therefore the actions taken by this Committee will have legitimacy and sustainability. It is comprehensible that the strengthening and empowerment of the Committee will open wide possibilities of having effective participation on the implementation of the watershed management plan.

Solution # 17: Shared water for all (LOCAL)

Jaime Alejandro Veces Mejía

CONAGUA, México

The solution adresses social management for conservation and water harvesting and watershed management in dry tropical indigenous communities in Mexico. Construction of a new model of organization at communities and regional level to strengthen local control, integrating technologies and generating a collective learning process that will guarantee the water supply in the region.

The proposal is a co-management scheme in which power and responsibility for the sustainable management and conservation of natural resources is shared among all stakeholders, but especially among the communities, different levels of government and the technical staff developer, in a lifelong learning process. Several concrete plans to manage micro basins have been prepared and implemented, showing the relevance and usefulness of the model.



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Solution # 18: Legislation on collective participation in water planning: basin councils and their subsidiary bodies, and strengthening of Technical Committees of Groundwater (COTAS) (NATIONAL)

Ulises Gonzalez Pedro Carranza
CONAGUA, Mexico

The solution chosen was the legal strengthening of local Basin Councils at a national scale in Mexico, through concurrent and coordinated participation of governmental (federal, state and municipal levels) and nongovernmental actors (in particular the local users) in these representative bodies, as well as the definition of relevant actions aiming a shared benefit for users of a basin.

Solution # 19: Systematization of municipal experiences of IWRM (LOCAL)

Fabiola Tábor Merlo
GWP

The solution addresses the strengthening of the MANCUERNA, a water management structure involving 8 municipalities located in the Upper Orange River Basin in western Guatemala. The solution is based on three strategic dimensions: management at basin and micro-basin level; municipal institutional strengthening and coordination and social participation. The users participation leads to a sustainable water and environment management and to a visible impact in living conditions of the local population.

Solution # 20: Case study of municipal experiences in integrated management of water resources: Municipality of Puerto Cortes, Honduras (LOCAL)

Fabiola Tábor Merlo
GWP

Through the consideration of Integrated Water Resources Management (IWRM) in the actions of the municipality of Puerto Cortes, Honduras its management became a model of decentralized water supply and sanitation services. It contributed to the reforms of drinking water and sanitation at national level and it has served as example to other national and regional initiatives.

Solution # 21: Costa Rica: Canon environmentally adjusted water use (LOCAL)

Fabiola Tábor Merlo
GWP

With support from various governmental, non-governmental and cooperation agencies, the Ministry in charge of water in Costa Rica (MINAET) took in 2006 the decision to increase the amount of water rate (water charge) to all user sectors through an economic instrument called “environmentally adjusted water use rate” (CAA). The generated financial resources are since then allocated to the actions needed to ensure water future availability. The use and implementation of the CAA in Costa Rica can be considered highly successful as a tool for water demand management, efficiency improvement, restoration of forest areas through financial contribution, as well as a mechanism for water sustainability involving different actors.



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Solution # 22: The creation of a binational management group for the preservation of the environment of the River Goascorán (REGIONAL)

Fabiola Tábor Merlo

GWP

The purpose of the initiative is to coordinate bi-national actions (between Honduras and El Salvador) to manage financial resources from national and international agencies, through the articulation and participation of different actors from both countries and the development of advocacy processes for the proper management of the basin.

Some of the tools used were the establishment of a transboundary organization for the management of natural resources, strengthening of the participatory capacity of civil society, elaboration of local policies / regulations and development of River Goascorán basin management plans. The Binational Management Group has five domains of action: advocacy, fund raising, education, communication and institutional strengthening.

Solution # 23: Associativity for achievements in IWRM in the Rio Naranjo basin (LOCAL)

Fabiola Tábor Merlo

GWP

Efforts to coordinate actions of the community associations and the eight municipalities involved have been promoted locally since a long time ago. They are aimed to ensure water resources sustainability and have relied on the implementation of participatory assessments as inputs to set guidelines for municipal water policies.

The objectives of cooperative efforts in the upper portion of the Naranjo River basin are to promote actions to implement water policies aims to reach agreements on waste management, water pollution, restoration of water recharge areas, promotion of productive and special water uses resources, through the dialogue between key stakeholders including authorities, civil society, associations, public institutions and cooperation agencies.

Solution # 24: State System of Water Resources Management in Ceará (LOCAL)

Francisco José Lobato da Costa

ANA, Brazil

The experience of the State of Ceará in the management of water resources is characterized by the search of a special model to semi-arid region.

The model is based on the performance of a single state agency - the Society of Water Resources Management (COGERH), build as a mixed economy society.

Allocation of water for multiple uses, backed by social decisions strategy is aimed at reconciling conflicts between different uses of water in semi-arid region, both between rural uses (farming family and irrigated crops) and the metropolitan region of Fortaleza (urban and industrial consumption).

As added value, mention should be the consistency of the data and inputs needed and the institutional space for negotiations that occur between uses and users for the purpose of (re) allocation of water for production systems that generate higher added value.



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Solution # 25: Management interface between regulators and service providers through enhancing performance indicators (LOCAL)

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The project falls under the Institutional category. The project plans to help the Palestinian Water Authority (PWA) in running its regulatory business on the service provider in Gaza by enhancing an effective management interface between PWA and the service providers in Gaza and the West Bank in the future.

This will be achieved by implementing a capacity building programme for PWA to carry out its regulatory and oversight functions through improvements in management procedures and systems, training measures, communications etc. In parallel; the Coastal Municipal Water Utility (CMWU) institutional and human resources capacity to be enhanced to cope with its role as a service provider satisfying the requirements of regulation. In addition to the capacity building, the management interface shall be enhanced by creating the methodology of performance measurements through a designed procedure and routine of reporting This process of performance measurement shall apply on the design phase of projects and shall continue for the implementation phase. In addition the provision of service shall be monitored by performance indicators taking in account the economical, environmental and technical aspects of the service The legal status of the service provider shall be reviewed in the light of the water law and accordingly, a legal establishment taking in consideration the revised mandate and statutes of the service provider shall be achieved. The solution has been designed for testing in Gaza strip, where it shall be expanded to the West Bank. Palestine in general is characterized with Mediterranean – tropical, semi – arid climate with an average rainfall of 320mm in Gaza, 650mm in the west Bank and suffers limited water resources. The Palestinian Water Authority, legally entrusted by the water law 3 /2002 to be the sector regulator has initiated this process. Implementation shall take place between PWA and the service providers in the water sector in coordination with other stakeholders. Hence, PWA shall report to the government on the service providers performance

Solution # 26: ISARM: facilitating regional processes towards joint management of shared aquifer resources (REGIONAL)

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The ISARM (International Shared Aquifer Resources Management) initiative is a UNESCO and IAH led multi-agency effort aimed at improving the management of transboundary groundwater resources. The international dimension of this type of management requires the application of Good Groundwater governance.

ISARM provides a neutral platform where countries can discuss and share experiences on management of shared aquifer resources without going directly into formal political positions and negotiations. ISARM initiated and facilitated regional processes such as ISARM-Americas, ISARM-SADC, ISARM-IGAD, ISARM West and Central Africa, ISARM Southeast Europe and ISARM Central and Eastern Asia. Furthermore, ISARM works on a global level by



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organizing scientific conferences on this topic. It initially focuses on fact-finding and information-sharing within communities of practice consisting of hydrogeologists, groundwater resource management, environmental social science, legal and institutional experts from the various countries. In a later process stage, policy-dialogues are added in the ISARM-framework. This contributes to building trust among the technical and policy-making entities from the neighboring countries and forms the base for more politically supported cooperation.

Solution # 27: Good governance of groundwater with particular focus on collective-choice level (LOCAL)

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Water Observatory website:

http://www.fundacionbotin.org/observatorio-del-agua_observatorio-de-tendencias.htm

Fieldwork photoalbum :

http://www.fundacionbotin.org/observatorio-del-agua_observatorio-de-tendencias.htm

The solution we are exploring is whether collective management of groundwater is a model that can meet good governance criteria, evaluating its process and its performance. In this study, following a Social Ecological Systems Approach and Institutional Analysis framework, we first identify the contextual and system characteristics, to then evaluate the resource governance according to a criteria. The objective is not only the governance analysis, but to test and create an adaptive criteria for a desired analysis. The focus on collective organizations for groundwater management can be explained by the ‘comparative advantage’ that local users can have over government in having the relevant information and potentially being able to control and monitor resource use, assuming they have an incentive to maintain the resource good status since costs can be potentially reduced when acting together, when often their (long term) livelihoods depend on groundwater. To determine the participation and power level and the incentives needed for a desired participation, an adaptation of Arnstein ‘participation scale’ is used as support. The objective of this assessment is to improve and empower collective action organizations, and to highlight the need of coordination with other actors such as Higher level authorities, scientists, policy maker for the good governance of groundwater resources. At least 19 GWUAs were identified in Spain. However, the research will focus on certain case studies (groundwater bodies): Campo de Dalías, Medio-Bajo Andarax and Campo de Níjar (Almería); Carbonatic aquifer in La Loma (Jaén); Alto Vinalopó (Alicante); Delta Llobregat, Cubeta Sant Andreu and Cubeta d’Abrera (Barcelona); Mancha occidental aquifer ; Mancha Oriental and Campo de Montiel.

Solution # 28: Role of community participation and partnerships in successful implementation of a water re-use scheme (LOCAL)

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Water Reticulation Services Virginia (<http://www.wrsv.com.au/index.htm>)

SA Water (<http://www.sawater.com.au/SAWater/Environment/>)



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Globally, rapid urbanisation and industrialisation has increased the pressure on existing fresh water resources. As a result, today fresh water has become a limiting factor and providing the water needed to feed a growing population and balancing this with all the other demands on water, is one of the great challenges of this century. Consequently, concepts such as water reclamation and recycling are considered as key components of water management systems around the world. Nevertheless, while developing successful and sustainable wastewater irrigation schemes, water managers, planners, and policymakers often encounter many challenges such as conflicting agendas among water agencies, addressing water rights issues, dealing with opponents to recycling/reuse; modifying existing regulations, and acquiring funding etc. Therefore, success and long-term sustainability of such irrigation schemes largely depend on the institutional organisation, enhanced community participation, and well-designed partnerships.

This case study illustrates how collective efforts and effectively designed partnerships between key stakeholders, backed up by effective regulatory and policy measures, has lead to development of a successful wastewater reuse scheme. The scheme ultimately has contributed towards sustainable development of the region. The reuse scheme discussed here is the Virginia Pipeline Scheme (VPS) which caters to the irrigation needs of the growers in the township of Virginia, Adelaide, South Australia. The region is described as South Australia's 'Veggie Bowl' because of its reputation to deliver high-quality horticultural produce to local and interstate markets.

Solution # 29: Natural Resource Management Levy (LOCAL)

Adelaide and Mount Lofty Ranges NRM Board on 8273 9100 or visit

<http://www.amlrnrm.sa.gov.au/>.

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In South Australia, at a fixed time interval every year four times a year, the NRM (Natural Resource Management) levy is imposed and presented to house owners in their council rates. The NRM levy is collected by councils and forwarded directly to the relevant NRM board rather than to the government treasury. The NRM levy is currently struck on the value of property/properties (NRM Act 2004, Section 95) and presented to the public as a separate line on their council rate notice, to help take care of local natural resources, such as water, soil, the marine environment, native plants and animals. Act, eight regional NRM boards were created across the State. Before 1 July 2006, Councils collected catchment levies in the former catchment water management board areas and paid these to the relevant regional Catchment Water Management boards. Likewise Councils contributed from general rate revenue for animal and plant control work and made these payments to relevant

regional Animal and Plant Control boards. Since 1 July 2006 the catchment levies and the contributions have been consolidated into a regional NRM levy. The NRM boards' activities are carried out in partnership with others, such as community groups, individual landholders, industry, local councils and government agencies.



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Solution # 30: Singapore International Water Week (GLOBAL)

PUB (Singapore's National Water Agency)

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The Singapore International Water Week was launched in 2008, with the aim of creating a platform for water professionals to debate and exchange practical solutions to key water solutions. Since then, the Singapore International Water Week has become a pinnacle event that brings together policymakers, industry leaders, experts and practitioners to discover opportunities, address challenges, showcase technologies and celebrate achievements in the water world. The event is organized by Singapore International Water Week Pte Ltd, a company set up by Singapore's Ministry of the Environment and Water Resources and PUB, Singapore's national water agency. The Strategic Partners are Asia Development Bank (ADB), International Desalination Association (IDA), International Water Association (IWA), Lee Kuan Yew School of Public Policy, Singapore Water Association. World Water Council has been the international supporting organization for Singapore International Water Week for 2010 and 2011.

Solution # 31: Horizontal Learning enables local governments to connect with each other to identify, share and replicate the good practices of their peers (LOCAL)

www.horizontallearning.net

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The Horizontal Learning Program is a Union Parishad led peer-to-peer learning initiative facilitated by the government of Bangladesh and supported by development partners. The HLP seeks to complement conventional efforts to strengthen the capacity of the UPs through a process of appreciative inquiry with peer-to-peer learning. The program is based on the assumption that capacities already exist and that networking peers around good practices can enable those practices to be identified and replicated to influence policies. While Bangladesh has significantly reduced the population without access to improved water supply and basic sanitation facilities, the achievement of the Millennium Development Goal (MDG) 7c is challenged primarily by the quality of service issues, and secondly, by access issues for the hard-to-reach people groups. In sanitation: use of a latrine is estimated at 93.5 percent; however, almost half of these latrines are either unsanitary or shared, according to UNICEF's Multiple Indicator Cluster Survey (MICS) 2009. In water supply: access to a protected drinking water source is almost universal (98 percent, MICS 2009); however, an estimated 12 percent of the population is still exposed to arsenic contaminated drinking water (MICS 2009), with an unknown percentage exposed to bacterial risks in drinking water supply chains. In this context, there is a need to promote the adoption of appropriate practices a) for the hard-to-reach groups and those affected by climate change; b) for ensuring the safety and sustainability of drinking water; and c) for improving market access to quality sanitation services. The Horizontal Learning Program (HLP) has demonstrated an ability to capture and replicate good practices (that is, arsenic mitigation, 100 percent sanitation, eco-friendly villages) that address the safety, reliability, affordability, and sustainability aspects of water supply and sanitation.



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Solution # 32: Global Framework of Action for Groundwater Governance (GLOBAL)

Groundwater Governance Project (FAO – GEF IW – UNESCO-IHP - IAH – WB)

The Groundwater Governance Project was launched in response to emerging global concerns over the increasingly unsustainable use of groundwater and the degradation of aquifers. The overall project objective is to raise awareness on the challenges and opportunities related to the management of groundwater resources with the aim of encouraging the inclusion of groundwater governance aspects on national, regional and international political agendas. The project will develop a global “Framework of Action”, consisting of a set of country-specific policies based on international best practices that would facilitate both the improved management and good governance of groundwater at local, national, regional and transboundary levels. The set of guidelines identified by the Framework of Action will encourage countries to adopt a broad range of policy, regulatory, institutional and economic reforms for the proper and sustainable management of groundwater resources. Stakeholders from all sectors (governmental, non-governmental, civil society, users, private sector, etc) are involved. A series of Regional Consultations in five regions of the world will play a crucial role in achieving a shared vision based on specific needs and true expectations in the different regions and countries.

Solution # 33: Governance and public participation in the Ebro River Basin organization, Spain (LOCAL)

Spanish basin organizations, called Hydrographical Confederations, are instrumental bodies with legal status, by mean of functional decentralization, dependent on the current Ministry and Rural and Marine Affairs. The history of basin organizations in Spain is firmly wedded to participation, since the creation of the Ebro Hydrographic Confederation (Ebro River Basin Organization) in 1926. The formal organization of the Confederations nowadays comes from the 1985 Water Act, and it includes several organs of different nature:

- Two organs of governance: the administrative Governing Board and the President appointed by the National Council of Ministers. The Governing Board: This is the main collegiate governing organ. Its role is to propose the Action Plan for approval by the President, to formulate budgets, to agree any necessary credit operations, and others. It is formed by representatives from the National Government and the Basin Organization, the Autonomous Communities (regions), and water users (at least 1/3 of the total). The President is the legal representative of the Basin Organization and presides over the collegiate organs. The administrative structure of the Basin Organization includes the Water Commissariat, the Technical Direction, the General Secretary and the Water Planning Office.
- Four participatory management organs: the Users’ Assembly, the Water Discharge Commission, the Operational Boards and the Boards of Works. They are at the core and basis upon which the user’s participation is built within the Basin organizations. The framework for users’ participation in the collegiate bodies is based on the Register of Waters in which all the rights for water use are listed. All users with listed rights form a census. Via an electoral process, several users are designated to become representatives in the Assembly of Water Users, and within this assembly are elected to integrate the different collegiate participatory bodies.
- One organ of participation and planning: the Water Council which is responsible for the discussion and final consultation of the Water District Management Plan. It is



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formed by representatives from the National Government and the Basin Organization, the Autonomous Communities (regions), the water users (at least 1/3 of the total), and representatives from stakeholders: environmentalists associations, trade unions, agrarian and business associations. During which meetings the National Government and the Autonomous Communities coordinate their planning strategies. Users have proportional representation within the water Council and it must be at least 1/3 of the Council's membership.

- One organ of cooperation: the Competent Authorities Committee where the National Government (the River Basin Organization) and the Autonomous Communities coordinate their planning strategies.

Solution # 34: Social capital for integrated water management in the Chili Basin, Peru (LOCAL)

In 2005, at the request of the Natural Resources Institute (INRENA) of Peru and supported by the Japan International Cooperation Agency (JICA), IMTA conducted a analysis consultancy of the organizational process to establish basin organizations in the Rio Chili, located in the southern region of Peru. It led to the creation of an innovative self-managed organization within which local authorities have played an important role. During the building process and subsequent consolidation, trust between users and water authorities was crucial, as were cooperation strategies between users and reciprocity of actions between social actors and institutions, proving that local social capital is necessary to consolidate and strengthen the basin self-managed organization.

Solution # 35 : Stratégie Nationale de l'Eau, Meilleure gouvernance, Unité de Gestion de Projet (NATIONAL)

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Pour renforcer le processus de planification et de gestion intégrées des ressources en eau et relever les défis majeurs liés à la raréfaction des ressources en eau impactée par les changements climatiques, à l'exploitation non durable des ressources en eau souterraines, à la faiblesse de la valorisation des ressources en eau mobilisées notamment dans le domaine agricole et à la détérioration de la qualité des ressources en eau à cause du retard dans l'assainissement et l'épuration des eaux usées, une nouvelle stratégie de l'eau établie pour un horizon de planification de long terme (20 ans), a été adoptée par le Maroc en 2010. Cette nouvelle stratégie de l'eau innovante et intégrée repose sur trois piliers à savoir (i) la gestion de la demande en eau et la valorisation de l'eau, (ii) le développement de l'offre à travers la mobilisation des ressources en eau conventionnelles et non conventionnelles et (iii) la préservation et la protection des ressources en eau, du milieu naturel et des zones fragiles (Assainissement et épuration des eaux usées, préservation des nappes d'eau souterraine, Préservation des zones humides, des oasis, des lacs naturels et du littoral). Il est important de signaler que cette stratégie nationale de l'eau a été élaborée en parfaite harmonie avec la Stratégie Méditerranéenne de l'Eau. La solution proposée concerne tout le territoire Marocain. La stratégie nationale de l'eau a été élaborée par le Secrétariat d'Etat chargé de



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l'Eau et de l'Environnement. Elle sera mise en oeuvre selon une démarche contractuelle territorialisée entre les agences de bassins hydrauliques et les régions et autorités territoriales.

Solution # 36: Integrated Water Resources Mangement (IWRM) only through an evolving integrated process (NATIONAL)

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Sri Lanka has 51 Acts over 40 Agencies dealing with water leading to duplication, confusion and inaction- fertile ground for corruption. Six ministries handle water functions leading to sectoral tensions and misallocation. An attempt a decade ago to establish a Comprehensive Water Policy and an Apex Body to regulate/allocate backstopped by an umbrella law could not carry with it public support or political commitment. The policy articulated was comprehensive assuming a one off and not as a dynamic or evolving. The Apex Body was to be in a “neutral” host viz the Finance Ministry, though not a water sector ministry had financial, economic return as priority. The Comprehensive Law drafted was another punitive and regulatory law that sought to “control” water allocation, regulation and management even at lower levels already covered and administered under existing laws and institutions. The process lacked support from the public who were not aware of the full implications and by agencies that saw usurping of their existing mandates. Sri Lanka. Applicable to South Asia / other region where irrigation sub sector is dominant and services free or highly subsidized , thus holding recipients to ransom, resulting in a agency/political nexus unwilling to change the status quo unless pressured by organized civil society /stakeholders.

Solution # 37: Integral system of drought control and inland quality water analysis by remote sensing (REGIONAL)

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The Project's main objective is to develop an integral system to analyse quality inland water and water resources from territories and to carry out a telematic dissemination of results to the stakeholders. Although the project was planned in the Mediterranean basin by providing the Valencia University satellite images, it can be done anywhere. The R&D company Grupo Nova Cartographia offered the idea to Dirección General del Agua de la Consellería de Agricultura, Pesca, Alimentación y Agua de la Comunidad de Valencia. Water Directorate of the Department of Agriculture, Fisheries, Food and Water in the Community of Valencia. Main water regional admistration of the Valencia Community (Spain)

Solution # 38: Community empowerment based approach of ensuring responsiveness and accountability of the Government Agencies to implement the water and sanitation commitments to the marginalized communities in India (NATIONAL)

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The solution is an over arching one that has legal, institutional, policy and communication dimensions. This solution has huge potential to address WASH sector governance problem which is the root cause and major source of various other problems deterring the progress on WATSAN goals. Those who are suffering for want of basic water and services must act in a smart and responsible way to make the mandated govt. agencies work effectively to cater to their needs. Establishing such a relationship between the citizens and state is very fundamental for not only achieving the goals of water and sanitation but also for the development in all other spheres. The core strength of this solution is the process of making citizens and state behave mutually in a more accountable, transparent and responsive manner. The solution is a systematic graduating process composed of five critical stages of progress sequentially linked. Firstly the communities are sensitized to demand for 100% WATSAN coverage. The next step is to educate the people about different WATSAN policies, laws and programmes of Govt. Further, to assess the actual implementation of the commitments the community organizations use tools of Right to Information Act, Social Audits & Public Meetings. After assessing the needs and gaps the CBOs are guided to represent their WATSAN issues to the concerned Govt. Agencies and also seek intervention of the local elected representatives. This is followed up with repeat visits and meetings. Such a systematic process compels the Govt. to initiate time bound action to meet the WATSAN demands of the community. The solution achieved through such people centered process guarantees its sustainability and replicability. 39,200 population from 10,440 households of 109 villages in Tadwai & Gudur Blocks of Warangal District in the State of AP, INDIA. This is predominantly Tribal area in-habited by Koya & Lambada communities characterized by Poverty, Marginalization and lack of access to basic WATSAN services.

Solution # 39: Innovative experiences of action research in the Garonne basin to anticipate global changes and prevent gaps between needs and supplies (LOCAL)

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One of the mission of the Adour-Garonne Water Agency is to improve the understanding of issues related to global change and to enhance stakeholders' awareness in the making process decision (including adaptation, prevention...). Thus, the Adour-Garonne Water Agency was involved recently in a national research project called IMAGINE2030 (Climate and water MAnagement: uncertainTies on water resources for the Garonne rivEr basin in 2030 ?). Forced by climate projections, two rainfall-runoff models calibrated under present climate conditions, provide for the future natural river flow for nine sub-basins. A warmer climate



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over the basin induces a decrease in mean annual runoff, a shift in snowmelt in mountainous areas and more severe low flows. Two models were developed to simulate the impact of a business-as-usual water management. The conclusions suggest more frequent drought and water crisis in the next decades. The Garonne Basin might experience major problems with water allocation among the multiple stakeholders.

Despite uncertainty regarding tools and assumptions considered within IMAGINE2030 project these first results were needed before discussing the possible strategies for adaptation. To adapt to global change may induce bifurcations rather than marginal adjustments, that only can be identify through a comprehensive forward-looking approach involving the water users and their ability/needs to face adaptation. To adapt to climate change as well as to warrantee good ecological status imposed by the European Water Framework Directive put the Water French Agencies in an unusual position: to be the driving force in the debate around water and its uses and to organize the discussion to help in the emergence of a collective strategy in water management at basin scale.

The Adour Garonne Water Agency has decided to continue the reflection initiated by the project IMAGINE2030 focused on the hydro-climatic aspects by a foresight analysis involving stakeholders, water users and decision makers through the Garonne2050 project. The objective is not to provide a detailed vision of the future. Garonne2050 is the first step towards the building of this future, by nature uncertain, to identify the degrees of freedom for the solutions. Based on methods of consultation and participation Garonne2050 will define the priorities for water management. The approach involves the elaboration of qualitative and narrative base scenarios and their assessment of their impact on water resources through hydrological models, socio-economic factors. The increase in our knowledge, even under large uncertainty, is major to answer more and more complex and inter-related issues. The elaborated and maybe rough scenarios at the first glance provide a knowledge base to consider future plans for action. Involving scientific knowledge and foresight approach enables to prepare for facing changes and to draw more desirable options.

Solution # 40: Guarani Aquifer System (GAS): from scientific knowledge to good governance (REGIONAL)

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The Guarani Aquifer is one of the largest freshwater aquifers in the world, underlying northeastern Argentina, central-west Uruguay, the west-central and southeast regions of Brazil, and with portions extending into Paraguay. Its immense capacity to supply the region with water for both present and future generations depends upon the good governance that can consider conservation and protection of the aquifer system as important priorities. The experience of the Guarani Aquifer System laid more emphasis on finding a solution to a possible dispute through interdisciplinary stakeholders' dialogue and a participatory approach. The excellent quality of the Guarani water makes it prime for consumption, and it is a crucial opportunity to experiment with diverse responses in an attempt to find viable solutions on governance. Securing and maintaining the water resources of the aquifer is a priority for all riparians because sustainable water management can serve as a basis for social



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and economic growth and development for much of South America and the MERCOSUR Common Market. While no management framework currently exists, advocacy and support for increased understanding and scientific knowledge of the functioning of the system, cooperation and protection of the Guarani Aquifer continues to grow. Parallel advancements and progress in the development of a legal framework for the Guarani Aquifer, and transboundary groundwaters generally, would have a dynamic impact on the management of these sensitive resources.

V. Recommendations for follow-up

A closer and more frequent monitoring of policies will be required to cope with fast-paced global changes and legislation and regulation may need to be somewhat more flexible to deal with uncertainties.

VI. Conclusion

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