

Synthesis Report

Economically Water Insecure Regions

Outcome and follow up from the Regional Sessions

(7th World Water Forum, 13-15 April 2015)

Table of Contents

- 1 Introduction and background
- 2 Understanding economically water insecure regions
- 3 Key outputs and implementation strategies
- 4 Future activities
- 5 Conclusions

Annexes

- 1 Summary of the EWI Sessions
- 2 Economic Water Scarcity in Latin America: from plenty to insecurity.
- 3 Addressing Economic Water Insecurity - An African Perspective

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1 Introduction and background

As part of the Regional Process of the 7th World Water Forum in Gyeongju, a series of five sessions were held with a focus on Economically Water Insecure (EWI) regions. This was the first time in the Forum that cross-regional sessions were included and thus an experimental approach for the Forum. The EWI sessions brought together participants from four regions to share experiences and lessons from countries/regions facing similar water and economic constraints - without being constrained by traditional regional geographical boundaries.

The sessions included inputs from Africa, Asia, the Americas and Europe. The sessions were organised by a Design Group partnership of Global Water Partnership (GWP) and K-Water (co-ordinators), the African Development Bank, the Asian Development Bank and the Development Bank of Latin America (CAF). Each organisation was responsible for preparing one session. The sessions are described in Annexes 1 to 5 which include the schedules and a brief outline of each session.

A key aim of the session was to improve global understanding of economically water insecure regions and how they impact in different areas. One aim was to define a common understanding of what we mean by the term “economically water insecure regions” and whether it is useful in helping to advance water security and sustainable development. The WWF7 sessions aimed to:

- refine understanding of the characteristics, themes and issues of economically water insecure regions;
- facilitate information sharing, knowledge generation, and collaboration across stakeholders from different continents;
- share cross-sectoral solutions and best practices;
- inspire enhanced action in these vulnerable regions.

The term “economically water insecure regions” refers to regions that face similar conditions with both economic and water insecurity. We did not seek to interrogate or define this term in-depth and do not present it as a new paradigm. Essentially the regions are those that are most disadvantaged and it can be said that about 90% of economically water insecure regions are also those in the lowest income category (i.e. eligible for World Bank IDA funding). Wealthy countries also face water insecurity in some regions and population growth and industrialisation can change a region from water secure to insecure. In essence, it is about how to achieve water security in those regions that face the most demanding economic situations and to make a case for prioritising investments even in the face of competing and limited resources.

It is increasingly apparent, from a growing body of experience and evidence, that there are many cross-regional commonalities with respect to shared conditions, thematic realities, and potential solutions. Therefore, the cross-regional process provided an opportunity to exchange knowledge, encourage dialogue, and share solutions for economically water insecure regions.

2 Understanding economically water insecure regions

There is a dual relationship between water resources and economic growth. On the one hand, water can stall and reverse economic growth through the destructive power of floods, droughts

and pollution; on the other hand it can drive production and economic growth across key sectors, including agriculture, energy, and industry. It is also the engine of social development through domestic service provisions, waste and pollution management as well as ensuring environmental integrity. This complex picture has been combined in the concept of “Water Security”, a widely accepted concept that encapsulates the relationship between water and economic growth. A useful contemporary summary of this link is provided in the recent publication: “Water Security and Economic Development”¹ and evidence based research is provided in the GWP-OECD commissioned report by a task force of eminent economists that was launched at the WWF7².

The notion of water security is increasingly being used to present a holistic approach that includes physical, social, economic and environmental factors. UN-Water defines water security as follows:

“Water security is the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.”

A key aim was to be practical and examine ways to achieve water security in areas that face special difficulties. The Sessions looked beyond the traditional water lens (i.e. on physical water scarcity/stress) in order to account for economic factors where human, institutional, and financial capital limit both management water resources and provision of water services even though water in nature may be available locally to meet human demands.

A previous attempt to use an economic lens, rather than a traditional water lens, was led by IWMI in their Comprehensive Assessment³. They highlighted the notion of economic water scarcity, and proposed a differentiation between the physical and economic limitations of water resources. There is a high degree of correlation between water stress and water scarcity, both physical and economic. Economic water scarcity may be the result of poor management of available water resources and symptoms could include a lack of infrastructure or weak planning. However, while the IWMI work was a significant and helpful contribution at a global level it was mainly related to agriculture (the major water user) and was focused on scarcity. The WWF7 discussions were significantly broader in scope.

Often the economic focus in water security is the level of investment in water services whilst the institutions, information, and infrastructure required to manage water resources, or the economic cost of water-related disasters, or the economic valuation of broader ecosystem benefits of good water management are neglected. Yet, it is also widely recognised that policy and market failures can exacerbate water insecurity. Similarly, sectoral policies and investments around

¹ Water Security and Economic Development, Evidence on Demand, May 2014

² Sadoff et al, (2015), Securing water, sustaining growth” A report of the GWP/OECD Tack Force, Oxford University Press.

³ IWMI, (2007), Comprehensive Assessment of water management in agriculture,

energy or agriculture are often made without regard to the secure and sustainable availability of water resources.

Given this dynamic interconnection between water security and economic growth there is now widespread recognition that many of the problems facing water come from outside the boundary of what is commonly considered to be 'the water sector'. This has led to calls to think 'outside the box' when formulating solutions. Against this background there is a need to focus on the condition of lacking water security due to both economic factors and water resources constraints.

For the purposes of this report we describe economic water insecure regions as those with the condition of lacking water security due to economic factors (e.g. lack of investment in water infrastructure, water data monitoring and/or water management). This framing adds focus on the most vulnerable regions and countries and those least likely to achieve water security recognising they may vary geographically, temporally and affect different segments of society.

3 Key outputs and implementation strategies

As well as framing the key issues, the five WWF7 sessions covered the water-food-energy nexus, water governance and water infrastructure as well as giving a specific perspective from Korea - a country that has experience of overcoming economic water insecurity. Key points from each session are given in Annex 1.

Each member of the Design Group will lobby for the adoption of a dedicated SDG on water as part of the post-2015 Development Agenda to be agreed by Heads of State at the UN General Assembly in September 2015. They will further promote water as a key element in the climate negotiations, COP21, in Paris in November 2015. Each organisation will develop strategies to support economically water insecure countries to achieve water security and support governments to achieve the proposed Sustainable Development Goal 6.

4 Future activities

All future actions have to be taken by governments and we can only respond to demand. So in the short term the key is to help EWI regions to set out their plans and actions to meet the SDGs.

The five members of the Design Group (ADB, AfDB, CAF, GWP and K-Water) will make their own plans for taking action following the WWF7. Each organisation will hold internal consultations and share the lessons learned from the Forum sessions. In principle the key action will be to determine the specific measures needed for those countries or regions facing economic water insecurity. This will ensure such countries are not left behind when implementing the post-2015 Development Agenda. This will require building human and institutional capacities, identifying investment projects, formulating financing packages and supporting countries to find development pathways that take account of local water and economic constraints.

Building on the global framework set out in the proposed Sustainable Development Goals, countries will take the lead in planning their post-2015 development agenda. The role of five Design Group members will be to help countries in this process, in particular with the following support:

1. **Provide the foundation for action:** share knowledge and information and apply it in practice; invest in governance reforms and institutional capacities that ease access to finance and ensure long term sustainability and benefits for all; facilitate and make best use of partnerships that work across sectors and scales including mechanisms to ensure inclusiveness and resilience of eco-systems.
2. **Invest in water security:** including water security initiatives as an integral part of national economic development efforts; prioritising investments that enhance an economy's resilience to water insecurity; blending a wide range of financial sources into packages that assist economically water insecure regions that would otherwise fall outside of conventional financial support.
3. **Set sustainable pathways and manage risks:** clarify risks and incorporate risk management strategies (such as risk sharing, reduction etc) into economic development and investment planning taking account future scenarios to avoid unsustainable development pathways; ensure water security efforts adapt to climate change as well as socio-economic changes.

As part of its support for water infrastructure investments and related governance reforms, the AfDB will encourage and support African countries to reinforce the focus on the economic and financial aspects of water management. It will support them in their journey to develop their own capacities to reduce the cost of achieving water security goals, allocate available financial resources better, and mobilise additional public financial resources. Specific activities may focus on developing capacities in the water sector for economic analysis, public financial management, project preparation, monitoring and evaluation, and inter-institutional coordination. Efforts may also be made to produce tailored analytical briefs that may be used at country level to make better case for investing in the sector to achieve water security. The AfDB will look to address this innovative agenda by working with other partners, and whenever possible in the context of country-led sector wide approaches.

The Global Water Partnership will seek funding to help countries, particularly those with economically water insecure regions, to make a rapid start to the implementation of the water goal, including: raising awareness at country level; planning and project preparation for institutional reforms and for identifying priorities for infrastructure; building capacities and sharing knowledge to enable countries to set out and carry out their own development paths.

5 Conclusions

The five cross-regional sessions were a new approach for the Forum Regional process and added value by bringing together people from diverse geographical locations that face similar problems. A range of excellent presentations from Asia, Africa, the Americas and Europe gave a wide view of EWI issues. These cannot be detailed here but are discussed in Annex 1 below.

The GWP presented an overview of economically water insecure regions: essentially a group of countries or regions that face both economic and water insecurity and are thus doubly constrained in their efforts to achieve water security and economic growth. A key finding was that whilst one region of a country may be water secure another may not (e.g. Peru, where 85% of people live in an area with 15% of water resources) and thus national policies need to take account of local differences.

A majority of countries facing water insecurity coincide with those eligible for grant funding, placing them in the poorest income category: the water security-economic development link is thus clear. Countries are trapped by low growth and water resources limitations and cannot easily escape this trap. It is important that the international community provide support, both expertise, experience and funding to help these countries. However, many more developed countries also experience some degree of water insecurity and face economic constraints to overcome such water insecurity.

A better understanding is needed of the water-related risks on investment and growth (and vice versa). It is also important to understand that the “E” of EWI refers not just to economics but also to the political economy of a country -- its governance regime, institutional culture and human capacities.

Water insecurity is costing the earth (literally and metaphorically). A recent study⁴ indicates that water insecurity is a drag on global growth in the order of US\$ 500 billion per year (excluding non-monetised impacts). The EWI countries are more fragile and suffer greater impacts and risks, including from climate change.

We heard from the ADB how water insecurity is about much more than domestic water supplies (the usual focus of the water “sector”). Water brings much wider benefits to society through the food and energy production that people and economies depend on. The session highlighted the dynamic relationship and how the necessary trade-offs between water users and getting the balance between the three nodes of the Water-Food-Energy nexus will be much tougher to find in EWI regions.

From the Americas we learned how urbanisation and weak governance can even shift regions from water security to water insecurity and the urban footprint can extend hundreds of kilometres beyond city boundaries. Rapid urbanisation happens despite water resources limitations, which are not factored into spatial planning. Moreover, asymmetric distribution of water resources and populations in some countries means that national statistics for water resources are not always helpful in policy making. In addition, water quality has to be factored into the water security mix and the old fashioned approach of developed countries: “grow now, clean-up later” is not viable. EWI countries need to be “smart” and adopt new technologies and ideas. Moreover, once achieved, maintaining water security is an on-going process as new challenges constantly arise.

The CAF highlighted the importance of building effective governance regimes; which takes time and evolves with political change. A political crisis (e.g. flood/drought) can be harnessed to bring about rapid change that in normal circumstances would be politically impossible e.g. as recently in Brazil - so don't waste a crisis. Governance reform is however one piece of the puzzle and cannot be achieved in isolation. In China institutional reform and science and technology are proceeding hand-in-hand to balance scarcity and growth.

The AfDB, as documented in its background perspectives paper, highlighted that overcoming economic water insecurity in Africa is a major challenge, but there is scope for radically reduc-

⁴ Sadoff C et al (2013), *Securing water, Securing growth*, Report of the GWP/OECD Task Force on Water Security and Sustainable Growth, Oxford University Press. www.gwp.org/water and www.oecd.org/water.

ing it. At the sector level, implementation strategies need to focus on re-making the water sector as a highly-effective value-for-money sector-- through smart packages involving both infrastructure policies and governance arrangements. At the national level, implementation strategies need to focus on adopting a whole-of-government approach to achieving water security. More public financial resources need to be allocated to build a water security platform as one of the pillars supporting the sustainable economic growth that African countries are looking for.

EWI areas face similar but more severe challenges with fewer options so they need to follow different development pathways and avoid being locked in to inflexible solutions. There is a strong dynamic relationship between water security and sustainable economic growth and the proposed SDGs provide an opportunity to help EWI regions to escape the trap of water and economic insecurity, if and only if national governments, and international support, find the right development pathway and avoid past mistakes. We were cautioned that whilst the proposed SDGs include the wider water issues we cannot be complacent: the forthcoming Financing for Development conference and COP21 negotiations still do not take account of water. On the other hand the business community at the 2015 World Economic Forum identified water as the biggest risk facing business.

The new cross-regional process introduced at the WWF7 has been a positive learning experience of sharing across geographic divides and should be followed at future Forums.

Annex 1: Summary of the EWI Sessions

Session 1 Framing the Issue

Session overview: Framing the issue - the water security paradigm (Mohamed Ait Kadi, GWP)

- EWI and water-food-energy nexus (Tom Panella, ADB).
- EWI and governance (Abel Mejia, CAF).
- EWI and infrastructure (Oswald Chanda, AfDB)
- A Korean perspective on EWI (K-Water)

The session provided an overall picture of the issue under discussion and introduced the other EWI sessions. Key points include:

Water is a global concern due to inter-connectivity of risks and globalisation. Water Security requires harnessing productive forces and mitigating negative forces. EWI is a drag on economic growth and government policy makers need to understand this and take a leadership role. A series of sequenced projects are needed covering infrastructure, institutions and information tailored to fit local circumstances with credit-worthy financial packages.

In Asia 75% of the countries are water insecure. We need a combination of process based IWRM interventions (what society can do for water) and outcome based water security interventions (what water can do for society). These should cover the five dimensions of WASH, Economics, urban, environmental and resilience. Wealth is not a sufficient measure for water security as governance, institutions, human capacities etc are critical - need to take a political economy approach

In Africa the cost of water insecurity is very high and weak governance and lack of finance (highly linked) are at the core. Huge investment is needed for infrastructure with public finance taking the lead. Africa has recently shown significant economic growth but water insecurity is changing faster with increased risks from climate change.

In the Americas there is a risk of moving from plenty to insecurity, with perceptions and evidence of water insecurity affecting people and economic output. Key concern is rapid urbanisation with cities having a vast catchment area extending beyond hydraulic boundaries. Water resources are poorly distributed with urban growth in dry areas leading to local EWI areas. There is a lack of flexibility to move water to where it is needed. Moreover, water quality is becoming more of an issue than quantity. Smaller urban areas are fragmented with no economies of scale and highly politicised. Ancient system of water rights a constraint and water security requires reform and bridging political divides - we need to stop talking to the converted.

The Korea example showed how a water short country has overcome water insecurity through a major government initiative and public-led financing. Issues to address include technical capacity, operating costs, high subsidies and poor links between water demand and water resources.

Session 2 Water, Food, Energy nexus

Setting the scene:

- The nexus in EWI areas and the food and energy challenges they face (GWP)
- Land, efficiency/productivity/trade: Understanding the nexus and future implications (IIASA) The information level is decreasing (less measuring gauges), the level of uncertainty is rising, data is a constraint on management of water resources.
- Moderated Panel based on 5 case studies
 - GWP-East Africa: nexus in Rural Africa: the case of Bugesera communities
 - FAO: Prices and subsidies and the Nexus: some questions Asia
 - CAF: OLMOS Multipurpose project
 - WRI: Public-Private Partnership in China's Sludge Management
 - Indonesia/Bappenas: nexus in Indonesia

The water food and energy nexus is an interesting approach to foster resource recovery and efficiency gains that will ultimately improve water security. The approach requires to be both clearly defined and operationalized through pilot testing at various scales and in various contexts.

The water food and energy nexus approach is still about integration and coordination. In many EWI political economies, finding a player which is powerful enough to apply the nexus as a planning tool, and impose optimal tradeoffs between the three nexus nodes may not be easy at all. There is some concern with the term "nexus", which should be treated carefully. There are many nexus and they are location specific.

Outcomes

1. The E of EWI means more than economics: The political economy (policy and institutions) matters - Water remains political, especially when it is scarce. EWI regions may be water insecure not only/or not because of their economic weakness. The countries and regions have to deal with political economies which prevent adoptions of adequate policies and institutional reform to support effective Water Resources Management, e.g. in India.
2. EWI regions are more susceptible to climate change impacts and their situation may strongly deteriorate over the next decades with climate change. Their vulnerability increases costs and warrants urgent action.
3. The nexus is a useful approach to understand the interrelation between 3 essential inputs for development of economies (Water, Food, Energy) The nexus as an integral approach enables water sector representatives to balance these three important sectors for economic development. Aims are resource recovery and efficiency gains, reduce water use as much as possible. Nevertheless, it is important to know how to integrate without making a complex problem more complex.
4. The nexus, like IWRM, is about integration but it takes the debate outside the basin boundaries and outside the water sector: the nexus concept may facilitate dialogue with politicians and finance ministries who have a wider perspective. The "nexus" may thus resonate more than IWRM with key decision-makers as it brings water outside the water sector and relates it to production and economic growth.
5. There are many ways to interpret the nexus concept and several levels at which it has been pilot tested (communities, basin, project, national, regional). However there may

be a need for consensus building on the concept definition and relevant level of application. Case studies reveal a broad range of interpretation of the nexus and suggest the concept is relevant at all levels but we must avoid creating confusion.

Session 3 Governance

Welcome and key messages José Carrera, Vice-president, CAF

- Large cities facing EWI head on in real time: how the Sao Paulo metropolitan region is managing a severe drought. (Ben Braga, Secretary of water and sanitation, State of Sao Paulo, Brazil)
- Long-term strategy implementation to address EWI: the case of Beijing and the Hai river basin. (Liping Jiang, Senior Water Resources Specialist, World Bank, Beijing, China).
- The Sahel fighting water scarcity: policy and institutional lessons. Status to date. (Tamsir Ndiaye, Directeur Général de la SOGED / OMVS Nouakchott- Mauritania).
- Governance to end EWI: reflections from a hundred-year journey in Spain. (Roberto Martín-Hurtado, Spain).

Discussion and closing remarks: Alan Hall, EWI Initiative, GWP.

Governance has been a major issue at the Forum and is a cross-cutting issue. It is not just about government but about systems - how things operate, the rules of the game. The presentations provided case studies from different regions covering a large city, a large basin region, a trans-boundary region and a country.

Rapid urbanisation and weak governance in Sao Paulo, Brazil has led to high service coverage but poor standards, low efficiency, poor cost recovery and stress on surrounding water resources, e.g. a 1-2% GDP loss due to environmental degradation. Need to upgrade technologies for more efficient use of water as well as more treatment of waste (only 20% treated in Sao Paulo). A lack of strong institutions and poor policy framework is restricting access to finance. International agricultural trade has been a major driver of water use.

A vicious cycle of initial abundance of water leading to low value, weak policy, overuse, waste, weak agencies and low quality infrastructure, means fast growing cities can shift quickly from water security to insecurity.

In the semi-arid Hai basin, China, the government has set out on a long term - 20 years - reform process to address increasing water insecurity due to rapid economic growth. Environmental degradation and water constraints are a brake on socio-economic development. A shift to resource efficiency in all water using sectors is introduced based on science (Evapotranspiration-based water balance, remote sensing etc) and governance (allocation, trade-offs, enforced regulatory system, etc). Also, participation with farmers based on incentive schemes for improved income from increased water use efficiency. A science plus governance approach.

The well known case of the OMVS on Senegal river illustrated a cascade of institutional arrangements has brought trust and sharing of water resources for the benefit of three neighbouring countries. Putting in place legal, regulatory and institutional systems and robust funding mechanisms (including for O & M), over a period of 40 years has led to a tripling of agriculture output and providing 100% domestic water services.

The example from Spain showed how water insecurity has had different characteristics and degrees of intensity across the country over the last 100 years. Water insecurity issues have evolved, due to economic, demographic and political changes. Economic growth and water investment reinforced mutually. As Spain "supply augmentation policies" seemed to be reaching their limits and the country grew out of being an agrarian economy, the central government tried to develop a new, mixed model, with a major emphasis on planning. But poor water governance has failed the country - indeed, water insecurity has been a driver of political and social conflict between the Spanish regions. EU membership imposed new goals for water policy, while

making available new financial resources that were not always wisely used. Despite being a high-income country, Spain faces economic challenges in achieving water security because it has not yet completed the transition to a modern approach and continued investing in infrastructure solutions that were not economically justified.

The four cases showed how developing governance systems takes time and as demonstrated by the example of Spain is an ongoing process rather than a short term 'project'. However, they also showed that a crisis can accelerate reforms (never waste a crisis) that would normally be politically impossible.

Session 4 Infrastructure

Introductions and plan for the session, Mike Muller, Consultant AfDB (Facilitator). Sharing and learning from the regional status, experiences and plans:

- Lessons from the region of Bilbao, Spain (R Martin-Hurtado).
- Sustainable infrastructure to end EWI in the Americas, (Abel Meija, CAF)
- Sustainable infrastructure to end EWI in Africa, (Oswald Chanda, AfDB)
- Panel Discussion and reactions on regional perspectives on EWI with a specific focus on what needs to change and how: Moderated by Prof. Muller.

A Perspectives Paper was prepared by the AfDB in advance of the WWF7 and the Executive Summary is attached as Annex 3. The session showed that achieving water security is a challenge for richer countries that also face economic constraints. It requires a differentiated approach for small, medium and large population centres. It is a long term evolutionary process that requires infrastructure but also in parallel the mobilisation of financial resources from water users and improved governance. In Spain, Water insecurity priority challenges have evolved from securing drinking water supply to de-pollution of the Nervion river, to addressing the risk of catastrophic floods. The evolution of water governance is not independent of the evolution of local government governance. As the local economy developed and grew, users were able to afford repeated increases in tariffs to face the increasingly complex water insecurity challenges through infrastructure solutions. Governance solutions can help address some economic constraints on infrastructure solutions - such as by getting municipalities together to reach economies of scale and unlock solidarity mechanisms that alleviate the burden for the smaller municipalities. Water institutions have to be fit for purpose and fit to finance. This requires robust economic analysis and sustainable financing models.

In many EWI regions in Africa there is significant hydrologic variability compared with more benign hydrologies as well as weak capacities and a high demand for infrastructure. Investment in infrastructure must therefore be strategic and based on sound information, exploit economies of scale, adopt low cost and smart technologies and take measures to reduce costs through better governance. Governments must commit long term public finance in order to attract other forms of finance. There is a dynamic relationship between economic growth and water security and they cannot be achieved sequentially.

Session 5 Sustainable Development post-2015

Welcome and opening. Lee Haksoo (Vice president, K-water)

- MDGs in the EWI regions, (KEI)
 - Introduction on Water Resources Project in Africa and Policy Implications for Post-Development, (KOICA)
 - Sustainable Financing System with a Korean Case, (K-water)
 - A case study in Africa, (AfDB)
 - SDGs in water sector, (Sunmoon University)
 - Panel Discussion: Moderator: Kim, Jeongin (ChungAng university) Panelists from GWP, Seoul National University, K-water, and Deltares (NL)
- Concluding remarks and summary of the five EWI sessions: Alan Hall, GWP

The session highlighted how Korea had moved from a war-torn country in the 1960s to a modern state and member of the OECD. Korea was water insecure but has developed its water infrastructure, its institutions and human capacities to achieve water security. It has also become a donor country supporting provision of water services in many countries. Korea has been a supporter of a dedicated water goal in the post-2015 development agenda.

In the panel debate it was stressed that although a SDG on water has been proposed and is well supported we should not be complacent and much remains to be done. For example, water is missing from the COP21 negotiations which continue to focus on energy and the Financing for Development conference in Addis also does not focus on water. Many water using sectors, such as energy and agriculture or industrial supplies do not give attention to their impacts on water resources. On the other hand business, at the World Economic Forum, has recognised water as the major global risk and is calling for action.

ANNEX 2: Economic Water Scarcity in Latin America: from plenty to insecurity.

Report prepared for CAF by Maureen Ballesteros, Abel Mejía and Víctor Arroyo

Executive Summary

Water scarcity is among the main problems to be faced by many societies in the 21st century. Water use has been growing at more than twice the rate of population increase in the last century, and, although there is no global water scarcity as such, an increasing number of regions are chronically short of water.

Economic Water Scarcity (EWS) is a type of water scarcity where human, institutional and financial capital limit access to water even though water in nature is available locally to meet human demands. EWS could be the result of poor management of available water resources, and symptoms could include a lack of infrastructure, with people often having to fetch water from rivers or lakes for domestic and agricultural uses. This document addresses the challenges of economic water scarcity and insecurity in the Latin American (LA) region.

With a population of 610 million people (8.6% of World population) and an area of 20.063.062 Km², (15% of the World territory), the region of Latin America and the Caribbean (LAC) constitutes a mosaic of 31 countries of the American continent, with an important climatic and geographical variety, which translates into a diverse and contrasting water scenario, that varies from abundance, with the biggest river in the world in the Amazon basin, up to the extreme scarcity, in one of the most arid deserts of the world, the Atacama, passing through the water shortage of the Caribbean islands.

The Latin American countries have a relative abundance of renewable water resources, which altogether represents **33% world water capital**, and it has a high per capita endowment with a regional average of **22.929 m³/per/year** (almost 300% higher to the world average).

Notwithstanding its water abundance, as well as the significant infrastructure investments, strong macroeconomic policies and the presence of solid democracies, there is wide evidence that the water problems in LAC are affecting the daily lives of millions of people, which makes **scarcity a major political and social subject**.

The problems of economic water scarcity are more tangible and evident in urban areas, due to the absence or inadequate provision of water services, but also recognized that it is limiting irrigation agriculture in LAC, as well as the successful challenge of economic activities such as tourism, industry and mining, or even produces perverse problems amongst sectors.

The main driving force behind scarcity in the LAC region is **the combination of rapid urbanization and weak governance**. Since the relatively abundance of water and the existence of infrastructure that explains high service coverage indicators for water and sanitation are frequently misleading; the proposition is that investments should look first into governance and infrastructure interventions that raise the efficiency in the use water and the performance of water services to the poorest population.

This strategic development priority is strongly supported by recent evaluations of the cost of **environmental degradation in the LAC countries** that have shown that the hidden economic cost of poor quality of water and sanitation services could be in the range of one to two percent of GDP. In the case of Colombia, for instance, a country with one of the highest coverage levels in the region, the economic cost of poor quality of water supply and sanitation was estimated in 1.04 percent of GDP⁵.

However, while urbanization and governance are the main drivers of economic scarcity, they are not the only ones. **The comparative advantage of the LAC region to compete in the global market (water and land)** is also a major driver to expand the agriculture frontier—mainly for exports of soy beans, sugar and

⁵ Ernesto Sanchez Triana.2007. *Environmental Priorities to Reduce Poverty in Colombia*. World Bank

meat. As global trade is rapidly transforming the regional landscape, it is increasing water demand in rural areas at the river basin scale. This is particularly relevant for Argentina, Paraguay, Bolivia and specially Brazil that have developed world class agriculture technologies and cropping practices that support high yields even in hot and humid climates. As a consequence, a substantial volume of water is exported in trade of food commodities (virtual water). Worldwide, virtual water trade of crops has been estimated at between 500 and 900 Km³ per year. An additional 130-150 Km³ is traded in livestock products. The virtual water exported by the LAC region is projected at about 190 Km³, or about 20 percent of the world estimate

The growing needs of water infrastructure require of investments that the countries in the LAC region have not historically performed. CAF has estimated that with regards to the APS sector, it is necessary to make an investment of at least a 0.3% GDP in the LAC countries. Likewise, it is necessary to improve the application of the resources through appropriate projects and technologies, and a better use since the existing water infrastructure is used inefficiently.

Water pollution is related to infrastructure and governance deficits in the water sector. Only 20 percent of wastewater is effectively treated in LAC, but there is infrastructure to treat about 35 percent. While large investments in wastewater treatment have been planned for Buenos Aires, Mexico City, Bogotá, Lima, and Sao Paulo, they have been delayed for many years because of the lack of strong institutions and policy frameworks that are hindering effective actions.

Low water productivity. When reviewing information about water productivity in the LAC countries (ANNEX #1) it is highlighted that the region has an average productivity of \$10 produced per m³ of the water used, less than the world average of \$10, but with countries with less than half the world average water productivity (Bolivia, Chile, Ecuador, Nicaragua, Paraguay and Uruguay). There might be several reasons for this, but it is evident, that in a hydrically abundant continent, this resource has not been seen as a scarce production factor, but on the contrary, an inefficient and non-sustainable culture of water use has been produced for the Latin American population. Which means that if the trend continues, the Latin American countries might move towards economic water scarcity.

Land use changes affect evapotranspiration, infiltration rates and runoff quantity and timing. It is particularly relevant to consider the reductions in the overall quantity of available runoff with some types of land cover change versus concentrated peaks of runoff associated with flooding under other land cover changes that can often be transferred downstream through river networks.

Lastly, **climate change** is another important driver of water scarcity in the medium to long term. Most global circulation models show that climate variability, intensification of extreme events and more frequent water-related natural disasters are enormously important for the LAC region. Projections derived from global circulation models point to changing precipitation patterns across the region, with increased winter rainfall in Tierra del Fuego, higher summer precipitation in southeaster South America, and drier conditions in Central America and the southern Andes⁶. The most relevant climate-driven effects in the region are expected to be: wholesale coral bleaching in the Caribbean, rapid retreat of tropical glaciers in the Andes, loss of density in the Amazon rainforest, coastal flooding, and increased frequency and intensity of hurricanes. For instance, the IPCC assessment and research from climate scientists have concluded that Mexico may experience significant decreases in runoffs, of the order of minus 10 to 20 percent nationally⁷. Ongoing studies show that a temperature increase of 4 degrees centigrade might lead to a collapse of the Amazon's rainforest ecosystem⁸. Water supply to cities will be affected—new water sources for Quito increases costs in 30 percent to replace the storage of shrinking glaciers.

In order to adapt to changing conditions, it is of the highest importance to have the **hydrometeorological information** necessary for decision-making. Even though there is base information in most of the LAC countries, some features must be deeply reviewed, such as the increase of coverage and the improvement of meteorological stations' locations and to reach the minimum recommended by the World Meteorological

⁶ De la Torre, et al. *Low-carbon Development. Latin America Responses to Climate Change*. World Bank 2010

⁷ P.C.D. Milly. et al. *Global pattern of stream flow and water availability in a changing climate*. Nature. 2005.

⁸ Levy et al. 2004

Organization (WMO). On the other hand, in order to improve the results of water balances, in the short term, it is recommended to use models including the use of soil and population and social variables, information that is not always available.

Using the broader definition of **EWI** suggested in this paper, priorities should account for deficits of water services that go beyond water availability, and include lack of infrastructure and inadequate governance systems (economic water scarcity).

Based on the analysis of data, regional reports and experience in development assistance, it is proposed that the priority water scarcity issue in the LAC region is in urban areas, in particular to improve governance of water utilities. Other priorities are to improve efficiency in irrigated areas and in rainfed agriculture; sustainable management of groundwater resources, actions to adapt to climate changes and to improve the pollution levels in surface water and the protection of aquifers.

ANNEX 3: Addressing Economic Water Insecurity - An African Perspective

Draft Perspectives Paper prepared for the AfDB by Roberto Martin-Hurtado, under the guidance of Maimuna Nalubega, Mohamed El-Azizi and Oswald Chanda of the AfDB. [Conference Edition for the 7th World Water Forum - not for citation].

Executive Summary

This paper is part of an inter-regional global effort to explore at the 7th World Water Forum the concept of economic water insecurity and how it can be addressed. The objective of this paper is to provide an African perspective on the concept of economic water insecurity (EWI) and how to use an “EWI lens” to inform water policies and interventions aimed at making Africa water-secure. This paper complements the Africa Synthesis Report for the 7th World Water Forum. The target audience of this paper includes: Senior water, economic development, finance and other key officials in Africa - to inform their strategic choices to achieve water security in Africa; The African water community (including all water users) - to seek their views on the relevance of the EWI concept for Africa and how it can influence current implementation of water sector strategies; The water community in other developing regions - to share some African experiences regarding economic aspects of water insecurity.

Development partners - to engage them in a discussion on how to improve existing partnerships to reduce water insecurity in Africa. Economic water insecurity is a novel concept. The EWI consortium has developed a working definition of economic water insecurity as “the condition of lacking water security due to economic factors - such as lack of investment in water infrastructure, water data monitoring and/or water management” (K-Water and GWP, 2014). The concept of EWI derives from the well-established concept of water security, which is a priority policy goal for Africa. UN-Water defines water security as “the capacity of population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and stability” (UN- Water, 2013).

Africa can benefit from looking at water insecurity through an “EWI lens”. Most, if not all, African countries suffer from some degree of economic water insecurity - whether related to water scarcity, water quality, water-related disasters, or drinking water supply and sanitation services. Overall, the continent has major water management needs, a low endowment of water infrastructure, and limited economic capacity to address the sources of water insecurity. This paper uses the metaphor of an “EWI lens” as a shorthand for looking at the challenge of water insecurity from an economic perspective. Using an “EWI lens” means trying to identify to what extent current water insecurity is due to economic factors, how the water sector should respond to tight economic constraints, and how to approach the financing of solutions (both infrastructure and governance) to achieve water security.

Economic capacity is a major constraint to reducing water insecurity. Africa’s water insecurity depends on multiple factors: physical, demographic, economic, insecurity, and climate change. In Africa, economic factors contributing to water insecurity are of the utmost importance- they include the level of exposure (how economic activities are exposed to water-related risks) and, most significantly, the lack of economic capacity to fund interventions that would reduce vulnerability and increase resilience. The most recent estimates put annual investment needs of the water sector in Africa at USD 50 billion for the period 2012-2020. This represents about 3% of regional GDP -- just slightly below the levels that OECD countries spend on all types of infrastructure (not just water related) and about one third of what emerging and developing countries spend on all types of infrastructure. Moreover, water infrastructure and governance has to

compete for scarce public financial resources with many other pressing needs, including for investments in infrastructure that is not water related.

There is scope for radically reducing EWI in Africa. While currently EWI metrics do not exist, it would seem that Africa's level of EWI is higher than in other developing regions. While African countries have generally limited economic capacity to address the sources of water insecurity, the continent has the potential to generate the economic resources to pay for the interventions needed to reduce EWI. But unlocking that potential and directing the financial resources to reduce water insecurity will not be easy. The same country (or region) that may be able to address water quantity issues because the services provided from water storage infrastructure generate revenues to pay for needed infrastructure solutions (such as multipurpose dams, with hydro-power financing the lion's share of infrastructure costs) may at the same time not be able to pay for other types of water security infrastructure - such as wastewater treatment plants.

Addressing EWI in Africa requires reform packages involving infrastructure policies and governance arrangements. The root cause of water insecurity in Africa is not the lack of water resources, but a combination of financial and institutional challenges. Most African countries are currently experiencing EWI through multiple components. Clearly, reducing overall EWI requires addressing those individual components through a mix of infrastructure and governance solutions focused on delivering water security services. At the same time, the continent is experiencing strong economic growth, population growth, urbanization, and climate change. Economic growth will increase the economic capacity of African countries to reduce water insecurity, but that set of trends creates new pressures on water resources and services. Anticipating and managing the impacts of those trends will also be crucial to ensure that EWI reduces overtime.

Adopting an EWI lens will reinforce the focus on the economic and financial dimension of water sector management. Africa needs to make the most of available financial resources for water. This requires (i) reducing the cost of achieving water security goals, (ii) allocating available financial resources better, and (iii) mobilising additional financial resources from the sectors that would benefit from enhanced water security services. The water sector needs to rebrand itself as a highly-effective value-for-money sector in order to gain credibility and attract financial resources from the public budgets, development partners, and financiers. It also needs to develop its capacities for economic analysis, public financial management, project preparation, monitoring and evaluation, and inter-institutional coordination.

Africa's tight economic constraints mean that minimizing the costs of delivering "water security services" deserves close attention. Key options include: reducing the need for infrastructure solutions, exploiting economies of scale and scope, adopting lower cost technical options, reducing the actual costs of chosen infrastructure solutions, and fighting corruption.

There is a strong case for allocating more public financial resources to address EWI. Many water infrastructure projects will never be "commercially bankable" in the sense of generating their own cash-flow to repay the loans used to finance them. But they will still be justified in economic terms (including social and environmental benefits by the "water security services" that they will provide to the concerned country as whole. When significant public financial resources are allocated to a right combination of water infrastructure projects and governance (a "water security platform"), the water security services provided by those projects will support economic growth and development, which will generate more domestic tax revenue, part of which can be used to pay for the cost of the "water security platform".

Addressing EWI would benefit from whole-of-government and sector-wide approaches. The responsibility for delivering water security goes beyond water sector institutions. Particularly in a context of very tight economic constraint, it would benefit from coordinated planning with beneficiary sectors and integrated investment programmes - for example with the agriculture sector to maximize the contribution to agricultural growth and food security. A whole-of-government approach should balance the short-term costs with the long-term benefits of investing in water security. But there is also scope to have a more coherent and integrated water sector response.

Some countries have developed sector-wide approaches for the drinking water supply and sanitation sub-sector, but such approaches are not yet common in terms of the water sector as a whole. This is needed to identify and take advantage of opportunities to channel scarce financial resources to their highest value uses.