BOOK OF ABSTRACTS

1. SESSION DESCRIPTION

ID: S5

Title of session:

Decision-support to incorporate ecosystem services into the Water Security agenda

Hosts:

	Title	Name	Organisation	E-mail
Host:	Dr.	Derek Vollmer	Conservation International	dvollmer@conservation.org
Host:	Dr.	Nidhi Nagabhatla	UNU-INWEH	Nidhi.Nagabhatla@unu.edu

Session description:

Fresh water is foundational to human well-being, yet the ecosystems that underpin human freshwater needs are disproportionately impacted by unsustainable human activity. Common underlying drivers include the chronic undervaluing of water-related ecosystems, the spatial and power asymmetries that exist between service supply and demand, and the fragmented interests among stakeholders in freshwater basins. A recent synthesis report by UN-Water (2013) 'Water Security and the Global Water Agenda' provides a conceptual framework that connects these various aspects of managing water resources, embedding aspects viz., transboundary cooperation, financing, peace & political stability, good governance, safe accessible water, ecosystems, water-related hazards &

climate change and economic activities & development. The ecosystem services paradigm offers an opportunity to further link these aspects, by engaging natural resource management and planning, integrating social and cultural values of ecosystems, leveraging indigenous and other knowledge systems, and addressing other complexities of water resources governance.

With the aim to synthesize how the water security agenda can benefit from the ecosystem services focused solutions, this session will bring together researchers and practitioners who are working to address these challenges through the application of decision-support tools. Invited presenters will speak about projects designed to synthesize information on ecosystem services and frame that information for specific decision contexts within the multi-dimensionality of aquatic ecosystems and beneficiary populations. Examples include indicator development, hydrologic and ecosystem service modelling, valuation frameworks, scenario building, and trade-off assessments, and all will have an applied research component demonstrated by close involvement of decision-makers or end-users.

Goals and objectives of the session:

- To invite perceptions of experts and thought leaders on policy options and concrete activities for implementing ecosystem-based approaches in support of the Water Security agenda
- To share experiences from applications of decision-support tools for ecosystem-based water resource management
- Launch of a book on the role of natural and constructed wetlands in pollution abatement

Planned output / Deliverables:

- Formation of a group of authors to produce a working paper on the topic of decision-support for incorporating ES into water resource management
- Development of a special issue proposal soliciting papers on the topic of ES in water management and water security
- The outcomes will also feed into a Global Scale Water Security curriculum currently under development

Related to ESP Working Group or National Network:

SWG 5 – ES in Water management

2. SESSION PROGRAM

Date of session: 12 December 2017
Time of session: 10:30 – 12:30

Timetable speakers

Time	First name	Name	Organization	Title of presentation
10:30	Derek	Vollmer	Conservation International	Welcome and objectives for session
10:36	Nidhi	Nagabhatla	United Nations University- Institute for Water, Environment and Health (UNU-INWEH)	Water security, a new paradigm to sustainable water management- Commentary on capacity building, Nature based Solutions (NbS) and community resilience
10:48	Clarita	Bustamante Zamudio	Ministerio de ambiente y Desarrollo sostenible e Instituto Humboldt	The analysis of risk of loss of ecosystem services as a tool for the generation of policy guidelines and integral management of water resources in Colombian Orinoquia
11:00	Nicholas	Souter	Conservation International	Applying the freshwater health index to Southeast Asia's transboundary 3S River basin

Time	First name	Name	Organization	Title of presentation
11:12	Alex	Marsh	South African National Biodiversity Institute	Safeguarding Ecological Infrastructure in strategic catchments through strengthened governance: a case study from South Africa
11:24	Abdullahi	Umar	Federal University, Birnin Kebbi	An appraisal of integrating productive ecosystem-based watershed management in Nigeria's water resources' legal, institutional and policy frameworks / documents
11:36	Yu	Wang	Center for Chinese Public Administration Research, School of Government, Sun Yat-sen University	Probing the micro-processes of water eco-compensation in the Dongjiang River, China: state policies, local agenda and rural development

Time	First name	Name	Organization	Title of presentation
11:48	Kremena	Burkhard	Institute of Environmental Planning, Leibniz Universität Hannover	Water takes the shape of its container – a better understanding of water flows and ecosystem services trade-offs for governance
12:00	Derek	Vollmer	Conservation International	Moderated discussion on linking ecosystem services to water security
12:25	Nidhi	Nagabhatla	UNU INWEH	Closing Remarks and follow up plans

3. ABSTRACTS

Type of submission: *Abstract*

S. Sectoral Working Group sessions: S5 Decision-support to incorporate ecosystem services into the Water Security agenda

Water takes the shape of its container – a better understanding of water flows and ecosystem services trade-offs for governance

Author(s): Kremena Burkhard

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The understanding of water flows have recently been through a crucial transformation that supports the better understanding of resource appropriation from local to global scales. Concepts as virtual water, water and ecological footprint, ecological backpack and environmental accounting conceptualize the perceptions of water flows and provide

tools to support sustainable water and resource management. Water transforms and "takes the shape of its container" – the T-shirts we wear, the apple we eat, the bread we bake, are few simple examples of commodities that require significant amounts of water for their production. Therefore their global trade creates invisible water flows that are presently not trackable and do not account for sustainable water use in production.

Within the Virtual Water Values (ViWA) project we investigate the sustainability of agricultural water use around the globe taking into account the possibilities for adaptation of production to water availability and the impacts of agricultural water use on other ecosystems and drinking water supply. Through the identification of Hot-Spots (areas of unsustainable water use) and Cold-Spots (abundance areas with sustainable water use) the directions of flows can be regulated (from Cold to Hot) and negative impact minimized or eliminated. The flow of water-intensive agricultural products from water-rich to water-poor areas guarantees the more sustainable water use in both areas and creates sustainable ecosystem services trade-off dynamics for water and agricultural products in support of the United Nation's (UN) Sustainable Development Goals (SDGs). In this

presentation we focus on the inventory of existing tools for investigation of (virtual) water flows, discuss their potential to inform and imply solutions for sustainable water flows and governance, and assess the relevance and impact of such approach for agricultural production, trade and resource justice.

Keywords: virtual water flows, sustainable water use, agriculture, governance, sustainable development goals

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Shenzhen, China 11-15 Dec 2017
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Restoring connections between people & landscapes through nature-based solutions

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S. Sectoral Working Group sessions: S5 Decision-support to incorporate ecosystem services into the Water Security agenda

The analysis of risk of loss of ecosystem services as a tool for the generation of policy guidelines and integral management of water resources in Colombian Orinoquia

Author(s): Clarita Bustamante Zamudio, Guillermo Rueda

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Other author(s): William López, Lyda Amparo Cruz, Alexander Perdomo, Omar Gaitán,Jorge Armando Cuartas, Camilo Torres, Adriana Melendro, Juan Fernando Tobón, Erika del Pilar Murillo, Natalí Acosta, Dolly Ruiz,María Teresa Palacios Lozano, Héctor Arsenio Tavera Escobar

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The Ministry of Environment and Sustainable Development of Colombia proposes, through the National Policy for

Integral Management of Water Resources and for its first level of management, the definition of strategic guidelines that allow the conservation of ecosystems and hydrological processes on which the country's water supply depends upon. This way, both the capacity to provide ecosystemic services related to water in the different hydrographic subzones of the Orinoco macro-basin in Colombia as well as the loss trend of these, associated the systematic transformations of ground coverage and land use generated by engines of change present in it. The ecosystemic services analyzed were: maintenance of aquatic habitats, maintenance of ecological processes, water storage capacity, flow regulation of surface waters, surface water supply, supply of hydrobiological resources and navigability; following this, the risk of loss of these ecosystemic Services was measured using analysis of probability of threat given by the transformation of the ecosystems directly associated with the water resources, in relation to the vulnerability given by the probability of change in Service offer. The strategic guidelines, which form the management basis towards conservation or improvement of the current status of these ecosystemic services, are handled through the creation of participation

and regional and local governance forums, in which decision makers of regional and local politics and representatives of the society create technical commitments based on use and financial goals.

Keywords: water resources, integrated management, risk, ecosystem services

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Safeguarding Ecological Infrastructure in strategic catchments through strengthened governance: a case study from South Africa

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South Africa is considered one of the most biologically diverse countries in the world due to its species diversity and endemism as well as its diversity of ecosystems. Much of this biodiversity underpins the delivery of ecosystem services and enhances the resilience of natural systems. The effective management of ecological infrastructure across landscapes – particularly within catchments that form part of strategic water source areas – is crucial in

order to ensure that biodiversity is able to deliver benefits to communities, contribute to rural livelihoods, and support sustainable development. We use the term ecological infrastructure to mean healthy or intact natural ecosystems that deliver valuable services to people.

The effective management of ecological infrastructure requires creative, collaborative and coordinated approaches involving the public, private and civil society sectors. Enabling good policy decisions requires a transdisciplinary and integrated governance practice, a suite of tools and vibrant Communities of Practice. The South African National Biodiversity Institute (SANBI) works nationally and across catchments, particularly in areas that are important for water security, to strengthen the research, policy and implementation interface in order to enable improved governance of ecological infrastructure.

This presentation will focus on the innovative platforms through which SANBI convenes and works with partners in order to facilitate interventions, such as involving landowners, various governmental sectors, and non-governmental organisations in improved management and targeted restoration efforts that strengthen the resilience

of landscapes that deliver ecosystem services. It will also explain the mechanisms, such as Research, Development and Innovation Platforms and Ecological Infrastructure Partnerships through which SANBI enables a feedback loop between research needs, implementation challenges and decision making processes. Key lessons, success factors and challenges will be drawn out and the next steps identified – such as the policy interventions planed through the GEF funded Biodiversity and Water Security Project – will be addressed.

Keywords: ecological infrastructure, governance, resilience, water security

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Water security, a new paradigm to sustainable water management- Commentary on capacity building, Nature based Solutions (NbS) and community resilience

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UN-Water (2013) synthesis report* 'Water Security and the Global Water Agenda' provides a conceptual framework and a 'shared approach' that connects diverse aspects and offers an opportunity to explore interconnectivity in the large thematic spread of water related issues. In doing so,

the framework combines resource management and planning, social and cultural values, indigenous and other knowledge systems, and targets wide-ranging complexities of sustainably managing water resources. With the goal to synthesize 'how the water security agenda can benefit from the innovative thinking and novel ideas', this paper will bring together three different aspects that are crucial to discuss existing water crisis. The first section of the paper will showcase a global capacity exercise (10 module online training program) executed jointly with expert and institutions to strengthen capacity on present-day challenges in water management by deploying a water security conceptual thinking. The second section of the paper will explain the response mechanisms many communities around the globe need to adopt/adapt to deal with water insecurity related problems viz., flood, drought and others, as water-related disasters worsens. The last section of the paper will present a brief summary of 'Multifunctional Wetlands-Pollution Abatement and Other Ecological Services from Natural and Constructed Wetlands' a monograph that collectively delivers a comprehensive synthesis of opportunities and the challenges associated with using water and wetlands ecosystems as Nature based

Solutions (NbS). Noting that addressing the need of capacity, innovation and participation is a complex task and often requires a case specific approach. The sections: education and capacity building; technology and ecosystems based approach to water and wetland management, and resilience, all of which are intended to discuss gaps in water security will be reflected. We attempt to sum information and knowledge to present a preview of selected interventions that UNU INWEH is undertaking towards its vision of a water secure world and implementation planning of the Sustainable Development Goals, mainly SDG 6.

Keywords: water security, sustainable development goals, capacity building, Nature based Solutions (NbS), community resilience

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Applying the freshwater health index to Southeast Asia's transboundary 3S River basin

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Southeast Asia's 3S river basin, which comprises the Sesan, Srepok and Sekong rivers, is one of the most important tributary basins of the Mekong River. The 3S rivers rise in Lao PDR and Vietnam and flow through Cambodia where they join before discharging to the Mekong. We assessed the status of the 3S river basin using the Freshwater Health Index (FHI), which measures a range of ecological health,

ecosystem service delivery and resource governance metrics. Using a combination of real and modeled data and stakeholder surveys, we assessed the basin's capacity to sustainably provide ecosystem services. Ecosystem Vitality and Ecosystem Services achieved scores of 66 and 79 respectively out of a possible 100, whilst Governance & Stakeholders scored 43. Thus, the 3S provides the desired ecosystem services, but there are signs of ecological and hydrological stress, and weak capacity to cope with rapid change. Stakeholder engagement is an important component of completing and FHI assessment and we engaged with the IUCN's 3S Bridge stakeholders group which comprises government officials, academics and NGO representatives from the three countries. By focusing on a common indicator framework this multinational stakeholder group was gained an appreciation of the 3S's current health and future management challenges. The FHI assisted the group identify data deficiencies and made the 3S's ecosystem-human-water dynamics more understandable. By establishing a common indicator framework we now hope to use the results to engage stakeholders in further exploring the FHI metrics and using them to develop a series of water resource management

thresholds.

Keywords: freshwater health index, hydropower, lower Mekong, water governance

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An appraisal of integrating productive ecosystem-based watershed management in Nigeria's water resources' legal, institutional and policy frameworks / documents

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Modernized efforts for harnessing Nigeria's abundant water resources for domestic water supply; irrigation and power generation commenced around 1923 when the first earth dam was constructed and subsequently many more dams were constructed in the 1970s during the oil boom and presently more dams are built in a pattern described as a form of top down approach intervention or

maladjustment that lacked proper planning; community participation that not only hinder optimal and efficient utilization of resources but threaten sustainability of the projects. Legal, institutional and policy framework / documents that evolved over time to create access, set standards and enforce regulations such as; the (Nigeria)Waterworks Act of 1915, the River Basin Development Authority (RBDA) Decree 25 of 1976 (1979 and987), the National Water Resources Master Plan, 1995, the National Water Policy 2004, National Irrigation Policy and Strategy for Nigeria of 2005 and the National Water Resources Master Plan 2013 among other legal/institutional and policy frameworks expounded on and intended to address challenges of water resources development and management in the Country. The aim of this paper is to present an appraisal of these policy and institutional framework in integrating or mainstreaming ecosystem based watershed management. We conduct a review of these frameworks. Our findings reveal that there is a paradigm shift from structural (engineering or hardware) approach to an integrated approach to water resources management that emphasized Productive Ecosystem-Based Watershed Management. The most recent

of these frameworks underlined the cross-cutting nature of water resources management and calls for synergy and collaboration, involving users, planners and policy-makers at all levels through participation, and with coordination and technical competence of specialised basin entities or Ministries, Department and Agencies (MDAs) as well as research institutions, donor and development partners. The recommendations are geared towards improving cooperation and complementing efforts and commitments of MDAs.

Keywords: integrated water resources management, ecosystem-based-watershed- management, institutional and policy framework

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S. Sectoral Working Group sessions: S5 Decision-support to incorporate ecosystem services into the Water Security agenda

Probing the micro-processes of water eco-compensation in the Dongjiang River, China: state policies, local agenda and rural development

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The notion of 'eco-compensation mechanisms' (ECM) is often labelled as a Chinese version of payments for ecosystem/environmental services (PES) in the existing English language literature. However, water ECM has demonstrated distinctive characteristics which are embedded in hierarchical bureaucracy and fragmented authoritarianism rather than in market-

based governance instruments. Moreover, the majority of the existing literature of water ECM focuses on its rationale, necessity and paradigmatic reform during policy-making process; whereas relatively few studies examine the processes and outcomes of policy implementation. This overemphasis on state primacy and institutional setting often neglects the importance of non-state actors and complex local conditions at the micro-level. This paper probes into the interface between the water ECM and its implementation in a rural context. It reveals that divergent pursuit of interests and internal conflicts exist among different types of upstream stakeholders who have jointly advocated water ECM. These internal conflicts and heterogeneities emerge as the approved eco-compensation scheme is incorporated into local agenda for economic development, poverty alleviation and ecological conservation. As a result, water ECM which intended to address inter-jurisdictional water conflicts and inequalities have been re-packaged, reshaped and re-organized by local corporate state and rural micro-politics, leading to an outcome that may deviate from its original intention. We argue that

the complexities nested in the implementation of water ECM, and ecosystem services oriented governance approaches in general, call for an alternative analytical framework which is sensitive to China's local politics in the fragmented authoritarian context, and for a more comprehensive perspective on the full policy circle of ecological conservation policies.

Keywords: water governance, policy implementation, local corporate state, fragmented authoritarianism, rural development