



## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Framework and Indicators

### Introduction

Water, poverty and environment are intrinsically connected. Areas of high biodiversity and richness are usually remote with low human density and, as a result, people living in close proximity to these areas tend to be impoverished with poor access to improved water sources and sanitation facilities. In the downstream reaches of rivers and lakes, acute water shortages are becoming the norm in some areas as the myriad of stakeholders take up or pollute water to meet their disparate needs e.g. heavy industry, irrigation for agriculture, fisheries, tourism, and municipal water and electricity utilities.

Water, sanitation, and hygiene (WASH) projects are a fundamental cornerstone for human development. Access to water can translate into increased economic productivity and healthier communities. Clean, fresh water is also critical for maintaining the hydrology and ecological diversity of a watershed, which determines the quantity, flow, and quality of water available. Increasing the well-being of a community through improved WASH can aid the development of a sense of stewardship to protect ecosystems and natural resources, particularly when integrated freshwater conservation and WASH programs increase people's understanding of the role that nature plays in sustaining the resources on which they depend.

The United States Agency for International Development (USAID) funded the Africa Biodiversity Collaborative Group <sup>1</sup>(ABCG) to produce an initial report titled, "[\*Linking Biodiversity Conservation and Water, Sanitation, and Hygiene: Experiences from sub-Saharan Africa\*](#)" (June 2012). The report found numerous projects in sub-Saharan Africa integrating *ad-hoc* WASH and biodiversity conservation on a disparate and disconnected basis. It called for guidance on how to integrate the two disciplines under different scenarios, ecoregions and climates. Building on the report, in 2013, ABCG members collaborated with a number of development organizations specializing in WASH to develop guidelines for the design and implementation of integrated projects to improve freshwater conservation and human well-being.



## AFRICA BIODIVERSITY COLLABORATIVE GROUP

<sup>1</sup> The Africa Biodiversity Collaborative Group (ABCG) is comprised of seven international conservation Non-Governmental Organizations (NGOs). Member organizations include the African Wildlife Foundation, Conservation International (CI), the Jane Goodall Institute, The Nature Conservancy (TNC), Wildlife Conservation Society, World Resources Institute, and World Wildlife Fund (WWF).

During the development of the ABCG "[Freshwater Conservation and WASH Integration Guidelines: A Framework for Implementation in sub-Saharan Africa](#)," published December 2013, monitoring and evaluation, indicators, and measuring results were themes that came up repeatedly as areas that were lacking research and guidance. Although biodiversity and WASH each have existing frameworks for evaluation, for example, the number of people impacted by a WASH project or hectares restored within a watershed, existing resources that evaluate the benefits of an integrated project were limited. USAID Associate Administrator, Bureau for Economic Growth, Education and the Environment, Christian Holmes cited that this gap is one of the major challenges the Agency has for the promotion and funding of these joint projects. We concluded it will take time to create a rigorous monitoring and evaluation framework for integrated projects, but there is an existing evidence base that can be drawn upon to make a meaningful contribution to this process by developing indicators, based on these experiences and lessons learned.

### **Purpose and process**

ABCG members, with support from the USAID Bureau for Africa, Office of Sustainable Development (AFR/SD), led a process to develop indicators that assess the outcomes of integrated WASH and freshwater conservation projects and to serve as a meaningful step towards developing monitoring and evaluation approaches for integrated human well-being and freshwater ecosystem conservation projects.

To progress toward this goal, a workshop was held in Nairobi, Kenya from July 15-17, 2014 for African conservation, health and development practitioners to design a Monitoring and Evaluation framework for projects that integrate WASH and freshwater conservation. It was co-hosted and facilitated by the African Wildlife Foundation (AWF), Conservation International (CI), and The Nature Conservancy (TNC).

The workshop was co-sponsored by the USAID AFR/SD and ABCG. Health, development and conservation experts from Kenya, Malawi, Rwanda, Tanzania and Uganda contributed technical advice and strategic inputs on a framework for how WASH and freshwater conservation projects can be measured in a more holistic, mutually-reinforcing manner.

Participants included representatives from AWF, Catholic Relief Services, CI, Jane Goodall Institute, Kenya Water Towers Agency, Kenya WASH Alliance, Millennium Water Alliance, Neighbours Initiative Alliance, Netherlands Development Organization (SNV), Total LandCare, TNC, Water for People, Water Aid East Africa, Water and Sanitation for the Urban Poor, Wetlands International, World Vision, and the ABCG program officer.

The group also developed an outreach plan for disseminating and validating the draft framework with donors, multi-sectoral partners and other conservation, health and development practitioners focused on sub-Saharan Africa. Contact, Colleen Sorto ([csorto@conservation.org](mailto:csorto@conservation.org)) with questions or comments about the M&E framework and indicators or the integrated project guidelines.

# GOAL: Improved human well-being and ecosystem health

## SO: Increase access to and use of WASH products and services integrated with the ability of an ecosystem to sustain these services

**IR 1** Increase first time and improved access to sustainable water supply

- 1.1** % of households (HH) with access to improved drinking water source
- 1.2** # of people with access to improved drinking water source
- 1.3** # of reported incidence of water borne diseases
- 1.4** # of water points with 0 fecal coliforms per 100/ml
- 1.5** # of village water user committee active at least 3 months after training

**IR 2** Increase first time and improved access to sanitation

- 2.1** # of people gaining access to improved sanitation facility
- 2.2 (a)** # of people practicing open defecation
- 2.2 (b)** # of open defecation areas in a village
- 2.3** # of communities certified as "open defecation-free" (ODF)
- 2.4** # of sanitation entrepreneurs
- 2.5** # of sanitation products and services available locally
- 2.6** % of population with improved access to sanitation products and services
- 2.7** # of people with improved sanitation products and services

**IR 3** Increase adoption of key hygiene behaviors

- 3.1 (a)** # of people practicing hand washing at critical times
- 3.1 (b)** # of functional hand washing facilities
- 3.2** % of HH with soap (or ash) and water at a hand washing facility commonly used by family members
- 3.3 (a)** # of liters of drinking water disinfected with point-of-use (POU) treatment products
- 3.3 (b)** % of HH that treat drinking water with POU treatment products
- 3.4** % of HH in target areas purchasing and correctly using recommended water treatment technologies
- 3.5 (a)** % of HH using safe handling practices
- 3.5 (b)** # of households storing their drinking water safely in clean containers
- 3.6** # of reported incidences of water borne diseases

**IR 4** Improved governance of water resources

See *value-added indicators below*

**IR 5** Improved freshwater ecosystem functionality, including water quality and natural flow regime

- 5.1 (a)** reduction of turbidity levels and total suspended solids (TSS) of water (where levels are impairing ecological function)
- 5.1 (b)** % difference between turbidity level and 5 or >5 NTUs
- 5.2** reduction in levels of phosphates and nitrates (in mg/L)
- 5.3 (a)** changes in the abundance and distribution of indicator species
- 5.3 (b)** # of E. coli and other fecal coliforms per 100 ml of water found at water source
- 5.4** natural variability of the system and continuous stream flow are maintained (including sedimentation patterns)
- 5.5** ratio of total renewable freshwater resources to freshwater withdrawal rate
- 5.6** % change in water flow/oxygenation rates/temperature regimes
- 5.7** % reduction in color (Pt-Co units. 'Platinum Cobalt' or Hazen units)
- 5.8** # of physical barriers obstructing migratory movements of species

**IR 6** Enhanced integrity of terrestrial and freshwater biodiversity

- 6.1** % of native vegetative cover
- 6.2** changes in the diversity index of native flora and fauna
- 6.3** distribution and abundance of invasive species

# VALUE-ADDED INDICATORS

GENDER	GOVERNANCE AND POLICY	COMMUNITY CAPACITY	PEACE + PROTECTION	YOUTH
<p>%/# of institutions with accessible sanitation facilities for both sexes (including disabled)</p>	<p># of people aware of WASH or freshwater conservation (FC) related-policies</p>	<p>% of community member groups involved in the management of freshwater resources</p>	<p># of water-related conflict incidences reported over time by the community</p>	<p>% of youth in decision-making in community-based WASH and FC structures</p>
<p># of laws, policies or procedures drafted, proposed or adopted by community to promote gender equality in integrated FW-WASH project participation and benefits</p>	<p># of forums carried out to engage the community to debate and influence WASH and FC policies</p> <p># of people satisfied with WASH/FC interventions being implemented</p> <p># of community managed institutions focusing on integrated WASH-FC</p> <p># of community level decision making bodies with progressive and transparent policy and budget processes</p> <p>% of representation by marginalized groups in community level decision making bodies related to WASH or FC</p>	<p>#/% of water management committees trained in management and maintenance of water and sanitation infrastructure/CBNRM</p> <p>% of community members understanding and acknowledging co-management roles, responsibilities and obligations for riparian catchment</p>	<p>% of community reported water-related conflicts incidents successfully resolved</p> <p>Ratio of new cases of community reported water-related conflict incidents to cases resolved in the previous three years (efficiency)</p>	<p>% of leadership positions held by youth in CBNRM and WASH committees</p> <p># of youth employment</p> <p>#/% of youth taking up WASH businesses</p>
<p>% of women in decision-making positions in community-based WASH and freshwater conservation</p>	<p># of people participating in accountability mechanism (define as level and quality) for integrated WASH-FC</p> <p># of changes or successful negotiations due to citizen participation</p> <p># of marginalized communities articulating and voicing demands for WASH and FC</p>	<p>#/% of communities able to renew, replace and rehabilitate their water infrastructure</p> <p>#/% of WMC/private operators functioning 3+ years after project completion</p>	<p># of available mechanisms to resolve disputes/% of population trained in conflict resolution</p> <p>% of watershed with clearly determined land rights title</p>	<p>% of youth trained in life-skills</p>
<p># of HH reached with WASH and conservation program intervention (sex disaggregated)</p>	<p># of spaces and mechanisms for institutionalized participation in policy formulation, planning and implementation</p> <p># and type of financial incentives designed to facilitate better (improved) access to WASH services and products</p>	<p># of water-based enterprises (related to WASH and FC)</p> <p>% of households accessing and utilizing water for production (e.g. crop, livestock)</p>	<p>% of people aware of individual water resource user rights</p> <p>% of community with equitable access to water</p>	
<p>%/# of women involved in the planning, design or implementation of integrated WASH-freshwater conservation interventions</p>	<p>% of water provision services provided by public authorities</p> <p>% of water provision services maintained by public authorities</p> <p># of community-based enforcement mechanisms or authorities established with the mandate to ensure water access rights and use in target regions (across a hierarchy of effectiveness)</p> <p>% of water points/water supply utility that is non-revenue</p>	<p>#/% households engaged in alternative livelihood activities</p> <p>Access to credit, diversity of income (varied units of measure applicable)</p>	<p># of community water users (proportion to available water sources)</p> <p><i>*Considering additional indicator to address resilience of water supply, systems, and management entities to extreme events</i></p>	

## **LIST OF ACRONYMS**

HH: households

WASH: water, sanitation and hygiene (WASH)

FC: freshwater conservation

CBNRM: community-based natural resource management

WMC: water management committee

NTU: nephelometric turbidity units

TSS: total suspended solids

## **CRITICAL ASSUMPTIONS**

Conservation/environment partnerships and alliances protect watersheds and sources.

Services include financing, access to products and services.

Sanitation services and products are supported by sewerage, water supply, manure pit, etc.

Biodiversity restoration or conservation efforts are attainable.

Project cycle is long enough to observe change.

Ecosystem function assumes pollution is reduced/water is managed well.

Sustainable land management practices are practiced.

Impacts from climate change in the project area do not dramatically alter the landscape.

Abstracted water is regulated.

Water sources with <5 or less NTUs have higher quality drinking water and also higher ecological function.

## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Indicators Table

Indicator	Rationale	Notes
<b>IR 1: Increase first time and improved access to sustainable water supply</b>		
1.1 % of Households (HH) with access to improved drinking water source	Standard indicators used to measure water coverage.	According to UNICEF, an improved water source is an infrastructure improvement to a water source, a distribution system, or a delivery point, which by the nature of its design and construction is likely to protect the water source from external contamination, in particular from fecal matter.
1.2 # of people with access to an improved drinking water source		
1.3 # of reported incidences of water borne diseases	Access to improved, sustainable water combined with improved hygiene behaviors should lead to a reduction in the reported incidences of water-borne diseases	
1.4 # of water points with 0 fecal coliforms per 100/ml	Standard indicator used to measure quality of water at a storage location prior to human consumption.	
1.5 # of village water user committees active at least 3 months after training	A longitudinal study is necessary to ensure that community members responsible for operation and maintenance of WASH facilities function over time.	Active is defined as water user committees with well defined roles, meets regularly, has a caretaker/maintenance person, and an active fee collection system (as needed).[USAID and OFDA]
<b>IR 2: Increase first time and improved access to sanitation</b>		
2.1 # of people gaining access to improved sanitation facility	Standard indicators that measure sanitation at the community-level.	
2.2 (a) # of people practicing open defecation		
2.2 (b) # of open defecation areas in a village		
2.3 # of communities certified as "open defecation-free" (ODF)		ODF status indicates that all households in a village have access to a sanitation products and services.

## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Indicators Table

2.4 # of sanitation entrepreneurs	This indicator is measuring the enabling environment for sanitation businesses and also based on the critical assumption that a dynamic private sector reflects demand and will contribute to decreasing the lack of sanitation.	
2.5 # of sanitation products and services available locally	WASH participants supported that there is a need to measure first if there are sanitation products and services available and then if they are being used.	
2.6 % of population with improved access to sanitation products and services		
2.7 # of people regularly using improved sanitation products and services		
<b>IR 3: Increased adoption of key hygiene behaviors</b>		
3.1 (a) # of people practicing hand washing at critical times	Standard indicator for measuring handwashing behavior	
3.1 (b) # of functional hand washing facilities	Base don the critical assumption that an important cause of non-compliance may be lack of functional facilities.	
3.2 % of HH with soap (or ash) and water at a hand washing facility commonly used by family members	Based on critical assumption that proximity of hand washing facilities with soap or ash will facilitate hand washing practices at critical times.	
3.3 (a) # of liters of drinking water disinfected with point-of-use (POU) treatment products	Standard indicator to measure treatment of water at household-level.	
3.3 (b) % of HH that treat drinking water with POU treatment products		
3.4 % of HH in target areas purchasing and correctly using recommended water treatment technologies	Standard indicator used to measure change practices at the household level	
3.5 (a) % of HH using safe water handling practices	Measure of adequate water handling practices to minimize contamination	

## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Indicators Table

3.5 (b) # of households storing their drinking water safely in clean containers	Necessary to separate household water treatment and safe storage because those who practice correct treatment may not store treated water properly and vice versa.	
3.6 # of reported incidences of water borne diseases	Access to improved, sustainable water combined with improved hygiene behaviors should lead to a reduction in the reported incidences of water-borne diseases	
<b>IR 4: Improved governance of water resources - VALUE ADDED INDICATORS</b>		
<i>Gender</i>		
%/# of institutions with accessible sanitation facilities for both sexes (including disabled)	This indicator is getting at the lack of clean and private sanitation facilities for women that allow for, among other things, menstrual hygiene. Cross-cutting because it is a factor for girls not attending school, etc.	
# of laws, policies or procedures drafted, proposed or adopted by community to promote gender equality in integrated FW-WASH project participation and benefits	Tracks the extent to which gender equality is addressed at the community-level.	
% of women in decision-making positions in community-based WASH and freshwater conservation	This indicator attempts to measure women's participation in decision-making around freshwater conservation and WASH.	for example - in water resource user associations (WRUAs)
# of HH reached with WASH and conservation program intervention (sex disaggregated)	This indicator differentiates female-headed households (FHHs) to ensure interventions are reaching this target population, based on critical assumption that FHHs have greater vulnerability.	
%/# of women involved in the planning, design or implementation of integrated WASH-freshwater conservation interventions	This indicator measures women's participation in the planning, design and implementation of interventions.	
<i>Governance and Policy</i>		
# of people aware of WASH or freshwater conservation(FC) related-policies	Tracks opportunities for targeted communities to receive information and engage on dialogue related to WASH/FC related-policies.	



## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Indicators Table

# of forums carried out to engage the community to debate and influence WASH and FC policies		
# of people satisfied with WASH/FC interventions being implemented	Tracks community awareness of the connection between FW/WASH interventions and perceived level of satisfaction	Household Surveys
# of community managed institutions focusing on integrated WASH-FC	Tracks if community-level decision making institutions that enable freshwater resource and WASH considerations to be made together and the inclusiveness, effectiveness and transparency of these processes	
# of community level decision making bodies with progressive and transparent policy and budget processes		
% of representation by marginalized groups in community level decision making bodies related to WASH or FC		additional indicators to consider instead (or with): # of new or improved laws that facilitate affirmative action for marginalized groups; # of legislative and policy changes enhancing rights of marginalized groups and promoting conservation of freshwater sources
# of people participating in accountability mechanism (define as level and quality) for integrated WASH-FC		
# of changes or successful negotiations due to citizen participation		
# of marginalized communities articulating and voicing demands for WASH and FC		
# of spaces and mechanisms for institutionalized participation in policy formulation, planning and implementation	Measures the opportunities available for decisions made (at the community level or other) to be brought to government processes	
# and type of financial incentives designed to facilitate better (improved) access to WASH services and products	Measures the available types of financing to enable WASH service implementation and long-term adoption- missing linkage to FW conservation aspect	
% of water provision services provided by public authorities	Tracks the connections between the functions of governance systems related to WASH-FC and on-the-ground WASH services	
% of water provision services maintained by public authorities		

## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Indicators Table

# of community-based enforcement mechanisms or authorities established with the mandate to ensure water access rights and use in target regions (across a hierarchy of effectiveness)	Tracks if there are mechanisms in place to ensure equitable access to WASH-FC services	
% of water points/water supply utility that is non-revenue	Tracks the proportion of non-revenue water to metered/tariff-based water sources as an indicator for service delivery for need-based populations	
<i>Community Capacity</i>		
% of community member groups involved in the management of freshwater resources	Measures community capacity to participate in WASH-FC management - ranging from awareness, to involvement, training and technical knowledge	
#/% of water management committees trained in management and maintenance of water and sanitation infrastructure/CBNRM		
% of community members understanding and acknowledging co-management roles, responsibilities and obligations for riparian catchment		
#/% of communities able to renew, replace and rehabilitate their water infrastructure		
#/% of WMC/private operators functioning 3+ years after project completion	Tracks the opportunities for community members to use WASH-FC conservation to develop sustainable income-generating opportunities	
# of water-based enterprises (related to WASH and FC)		
% of households accessing and utilizing water for production (e.g. crop, livestock)	Measures community capacity to generate income from improves access to water for production, alternative livelihood opportunities, or other finance options due to WASH-FC interventions	
#/% households engaged in alternative livelihood activities		
Access to credit, diversity of income (varied units of measure applicable)		

## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Indicators Table

<i>Peace + Protection</i>		
# of water-related conflict incidences reported over time by the community	Measures capacity of communities to monitor, report and manage conflict.	
% of community reported water-related conflicts incidents successfully resolved		
Ratio of new cases of community reported water-related conflict incidents to cases resolved in the previous three years (efficiency)		
# of available mechanisms to resolve disputes/% of population trained in conflict resolution		
% of watershed with clearly determined land rights title	Access to water is clearly linked to land tenure. Conflict over land is far more likely to escalate and become violent when land tenure and resource rights are weak or insecure.	
% of people aware of individual water resource user rights	Measures that people are able to articulate their individual rights related to the use of water	
% of community with equitable access to water	Based on critical assumption that competition over limited and changing water resources is an acute source of conflict.	
# of community water users (proportion to available water sources)		
<i>*Considering additional indicator to address resilience of water supply, systems, and management entities to extreme events</i>		resilience to floods, droughts, political instability, etc..
<i>Youth</i>		
% of youth in decision-making positions in community-based WASH and FC structures	These indicators measure youth's participation in decision-making and leadership.	Importance here is how we define youth (e.g. all persons between the age of 15 to 24)
% of leadership positions held by youth in CBNRM and WASH committees		
# of youth employment	These indicators gets at widespread youth unemployment, and the opportunity for WASH to provide opportunities.	
#/% of youth taking up WASH businesses		
% of youth trained in life-skills	This indicator is a measure of progress in implementing life-skills based education through FW/WASH interventions.	

## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Indicators Table

IR 5: Improved freshwater ecosystem functionality, including water quality and natural flow regime		
5.1 (a) reduction of turbidity levels and total suspended solids (TSS) of water (where levels are impairing ecological function)	Turbidity and TSS most visible indicators of water quality.	
5.1 (b) % difference between turbidity level and 5 or >5 NTUs	WHO/UNICEF drinking water standard	nephelometric turbidity units (NTU) - critical assumption: water sources with <5 or less NTUs have higher quality drinking water and also higher ecological function
5.2 reduction in level of phosphates and nitrates (in mg/L)	Nitrogen and phosphorous in excess amounts can cause significant water quality problems, this indicator is measuring for acceptable levels.	research needed to determine standard
5.3 (a) changes in the abundance and distribution of indicator species	The level of pollution in water can be indicated by the species living there.	
5.3 (b) # of E. coli and other fecal coliforms per 100 ml of water found at water source	Used as indicators of possible sewage contamination because they are commonly found in human and animal feces.	
5.4 natural variability of the system and continuous stream flow are maintained (including sedimentation patterns)	This indicator is looking at stream flow trends over time to measure change and climate variability.	<ul style="list-style-type: none"> <li>- Magnitude: the volumetric flow rate or level; for example, 100 cubic meters per second</li> <li>- Timing: the time of year during which a flow event occurs; for example, August</li> <li>- Duration: how long an event lasts; for example, 3 weeks</li> <li>- Frequency: how often the event occurs; for example, every 2–3 years</li> <li>- Rate of change: the rate at which flows or levels increase or decrease in magnitude over time; for example, a 0.2 meter-per-day flood recession rate</li> </ul>
5.5 ratio of total renewable fresh water resources to fresh water withdrawal rate	Measuring human-derived pressures on freshwater systems (surface and groundwater).	Freshwater withdrawals refer to total water withdrawals, not counting evaporation losses from storage basins.

## ABCG Freshwater Conservation and WASH Monitoring and Evaluation Indicators Table

5.6 % change in water flow oxygenation rates/temperature regimes	Standard indicator for water quality -- dissolved oxygen is essential for survival of all aquatic organisms.	
5.7 % reduction in color (Pt-Co units. 'Platinum Cobalt' or Hazen units)	Visual comparison method to characterize a natural water's organic content.	
5.8 # of physical barriers obstructing migratory movements of species	Indicators of habitat connectivity and fragmentation	
<b>IR 6: Enhanced integrity of terrestrial and freshwater biodiversity</b>		
6.1 % of native vegetative cover	Focus on extent and change in extent of native vegetative cover which contributes to deeper root systems and groundwater, better protection for surface water, more secure habitat for biodiversity, etc.	
6.2 changes in the diversity index of native flora and fauna	Standard biodiversity indicators.	abundance, distribution, richness, and composition) higher relative abundance, distribution, richness and composition of flora and fauna
6.3 distribution and abundance of invasive species	Indicator measuring trends in number of invasive alien species which constitute a leading threat to freshwater and terrestrial biodiversity.	