



WASH and Water Security

Integration and the role of civil society

Watershed
empowering citizens



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Colofon

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Executive Summary

The need for sustainable WASH services to include water security issues is becoming increasingly accepted. WASH requires water abstraction from the hydrological cycle while climate change and growing competition are changing the availability of water in many areas in the world. Where WASH systems are not well managed, untreated human waste is often disposed of directly into water bodies, thereby degrading ambient water quality, and increasing the costs of providing clean drinking water later and elsewhere. Such adverse environmental impacts may also negatively affect the functioning of (especially) aquatic ecosystems such as wetlands and the potential to provide services and goods.

Sustainable Development Goal 6 acknowledges these linkages and promotes integrated approaches to address sustainable WASH services delivery in an increasingly water insecure world. Integrated approaches which may include water quality control, ecosystem management/restoration, and IWRM are imperative for ensuring the sustainability of WASH as expressed in the SDG6 targets.

Although WASH is a minor water user in general, WASH is fundamentally different from other water uses, as drinking water availability is continuous and requires high-quality water. Wastewater treatment and the protection of water quality seem to be the least developed parts of WASH and IWRM in many countries. 80% of discharged wastewater is still untreated and severe pathogen pollution already affects around one-third of all river stretches in Latin America, Africa and Asia. In order to better manage the sharing of scarce water resources, and avoid the degradation of water and land, many countries have tried to institutionalise the IWRM principles and Action Agenda. In practice, this varies from centralised and sometimes highly politicised plan and control institutions to participatory mechanisms that put peoples water needs first. Increasingly the importance of healthy ecosystems in supporting livelihoods and development is fully acknowledged. Nature-based solutions to water challenges, including the provision of water and sanitation, are gaining popularity.

Water crises like limited access to water and sanitation are increasingly viewed as water governance crises. Acknowledging that water issues are linked in the biophysical system, it is clear that water secure (and climate resilient) WASH services delivery requires a closer connection between those entities that are trying to solve “adjacent” issues. Integration in the sense of new institutional arrangements, new framings of water issues at stake and new partnerships with all relevant actors are needed to solve these crises. However, this is simpler said than done. Real integration requires people and organisations to redefine

the spaces they normally operate in (sectoral silos), or at least to cross boundaries between those spaces. This is challenging in practice as world views, normative frameworks, targets, interests and institutional operation mechanisms including funding differ across spaces.

Integration can take place in many forms and shapes and covers a spectrum. In its fullest and widest form, integration requires full-fledged, joint planning across the themes of WASH, water quality, water resources management and ecosystems, based on a joint vision. However, integration does not necessarily mean merging sectors and may pragmatically only mean occasional coordination between individuals, programmes and organisations. Various sets of guiding principles exist upon which the most appropriate form and level of integration for a particular WASH, IWRM or freshwater conservation cause can be based. A list of 24 examples integrating WASH, water quality control issues, IWRM and ecosystem management is presented in this report. The examples address integration at different water governance levels – from the global to very local – and across different fields like frameworks, policies and institutional setups, financing and programming.

Civil society organisations have a pivotal role to play in achieving the desired level of integration by virtue of the many roles they play in addressing societal issues, such as: catalyst, capacity-builder, citizen representative, service provider and information broker. CSOs are often well equipped to be so-called boundary organisations, helping others to cross boundaries between spaces and building new forms of collaboration, integrating WASH, water quality control, IWRM and ecosystem management issues. The purpose of this report is to provide knowledge for CSOs concerned with sustainable WASH services delivery and water security to influence policies and to advocate for the required integration to happen.

Abbreviation

| | |
|----------|--|
| ABCG | Africa Biodiversity Collaborative group |
| CSO | Civil Society Organisation |
| GWP | Global Water Partnership |
| HCES | Household Centred Environmental Sanitation |
| HRWS | Human Right to Water and Sanitation |
| ICDP | Integrated Conservation and Development Project |
| IWRM | Integrated Water Resources Management |
| MDG | Millennium Development Goals |
| MUS | Multiple Use Systems |
| NGO | Non-Governmental Organisation |
| NRDC | Natural Resources Defence Council |
| OECD | Organisation for Economic Co-operation and Development |
| PHE | Population, Health and Environment |
| SDG | Sustainable Development Goal |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environmental Programme |
| UNESCAP | United Nations Economic and Social Commission for Asia and the Pacific |
| UNICEF | United Nations Children's Fund |
| UN-Water | United Nations Cross-entity Overall Water Programme |
| WASH | Water, Sanitation and Hygiene |
| WEHAB | Water, Environment, Health, Agriculture and Biodiversity |
| WGF | Water Governance Facility |

Chapter 1

Introduction

1.1 WASH and Water Security

Increasingly it is understood that provisioning of sustainable WASH services should consider water security issues. WASH requires water to be abstracted from the hydrological cycle. Climate change and increasing competition for water resources changes the availability of these water resources in many areas in the world. Hence availability of water for WASH services can be taken for granted. Likewise, where WASH systems are not managed well, untreated human waste may be disposed of into water resources, thereby degrading ambient water quality, increasing the costs of providing clean drinking water later and elsewhere. Such adverse environmental impacts may also negatively affect the functioning of (especially) aquatic ecosystems such as wetlands, upon which people may depend for their livelihoods.

The water security discourse addresses the complexity of water use, linking various parts of biophysical systems to uses, and users to health, livelihoods, economic development and healthy ecosystems. Clearly, this discourse formed an important basis for the formulation of Sustainable Development Goal 6 (SDG6) which embraces the same complexity and promotes integrated approaches to address sustainable WASH services delivery in an increasingly water insecure world.

Better integrated approaches towards WASH services delivery, which includes ecosystem management and restoration and IWRM, are a key element to ensure its sustainability. Understanding the need to put WASH services delivery in the wider water security context now raises the next question of who should make this possible. It may be that different people, organisations and sectors who worked more independently now need to cooperate – and that such cooperation needs to be done

in a good water governance way. It starts with the “customers” of WASH services needing to be able to trust that there are adequate long-term water resources for the WASH services to function. It requires that other users of water resources and ecosystems need to understand how their levels of water security are affected by WASH development. These different users need to be able to discuss and negotiate water security, often at a catchment scale. Different types of CSOs have an important stake in the integration between WASH and water security and may play an important role in safeguarding the good governance. For this to happen, CSOs should have an understanding of the hydrological cycle, current patterns of water availability and use, and the implications of future changes. In that way, they can hold accountable the government agencies responsible for water resources management and influence decision making.

Drinking water availability, everywhere, for everyone and all the time. Water is essential to life but its provisioning faces growing challenges due increasing competition for freshwater, the impacts of climate change and water quality degradation taking place in many river basins across the world. (Photo: Creative Commons CC0).

1.2 The role of SDG6

The Sustainable Development Goals form the current global framework governing development. The 17 goals cover a broad range of sustainable development issues, including ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change, and protecting oceans and forests. SDG6, ensuring the availability and sustainable management of water and sanitation for all, is obviously most pertinent to the issue of WASH and water security. SDG6 includes several targets that contribute to the overall goal.

Water security

Water security can be defined as 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 (UN-Water, 2013). A summary of core elements necessary to achieve and maintain water security, as found in a broad range of published definitions are:

- Access to safe and sufficient drinking water at an affordable cost in order to meet basic needs, which includes sanitation and hygiene (cf. United Nations General Assembly, 2010), and the safeguarding of health and well-being;
- Protection of livelihoods, human rights, and cultural and recreational values;
- Preservation and protection of ecosystems in water allocation and management systems to maintain their ability to deliver and sustain the functioning of essential ecosystem services;
- Water supplies for socio-economic development and activities (such as energy, transport, industry, tourism);
- Collection and treatment of used water to protect human life and the environment from pollution;



Drinking water availability, everywhere, everybody and all the time. Essential to life but not as obvious as one might think with increase competition for fresh-water, climate change effects and water quality degradation taking place in many river basins across the world. Photo by Creative Commons CC0

The first two targets are about achieving universal access to safely-managed water and sanitation services. The third target aims to increase wastewater treatment, thereby supporting WASH but also other human and ecological functions that rely on clean water, as targets are set for levels of wastewater treatment and ambient water quality. The fourth target clearly recognises the role of IWRM as a means to achieve sustainable and equitable water use. The fifth target addresses transboundary aspects of

water management. The sixth target acknowledges the intricate linkage between water resources, water quality, the functioning of ecosystems and the benefits people may derive from healthy landscapes. Two additional cross-cutting targets stress the need to invest and build capacity within the international cooperation sphere and the importance of local stakeholder engagement.

SDG 6: Ensure availability and sustainable management of water and sanitation for all

- 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all
- 6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
- 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
- 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
- 6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate
- 6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes
- 6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies
- 6.b Support and strengthen the participation of local communities in improving water and sanitation management

Important differences between the earlier MDGs and SDGs for water and sanitation are that:

- The focus is no longer on access to WASH, but on WASH services delivery, reflected in indicators for water quality, availability and accessibility, and management of faecal waste.
- WASH services delivery is explicitly linked to the sustainability of water resources, reflected in the various targets on ambient water quality, IWRM and ecosystem management (in spite the title being focused on water and sanitation).

1.3 Purpose and audience of report

Among NGOs and that CSOs working in the field of WASH, water and other natural resources management, there is a diverse understanding of WASH and water security relationships and how elements of ecosystem management and IWRM play a role. This report consolidates current knowledge and experiences on:

1. Why it is important to see WASH in a wider water security context, and;
2. how elements like water quality, water use, ecosystem management and IWRM are linked and need to be considered together;

3. how people and organisations connect across boundaries and why integration is needed to make this happen;
4. and the role CSOs can and should play in creating the right level of integration.

It is assumed that CSOs concerned with sustainable WASH services delivery and water security can use the knowledge from this report to influence WASH and water security related policies and advocate for integration to happen.



The Sustainable Development Goals cover a broad range of sustainable development issues, including ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change, and protecting oceans and forests across the globe. Photo by Silicon Peace



WASH water use is fundamentally different from other uses in the sense that it requires continuous high-quality water availability everywhere where there are people in order to meet health standards. Photo by Alkvo under Creative Commons license

Chapter 2

WASH and the SDG6 targets

This report addresses WASH services delivery in the wider context of water security. This section describes how various SDG6 targets are linked to WASH, and how integrating a WASH sector that traditionally deals with the other targets may lead to more water secure WASH services delivery.

2.1 WASH (targets 6.1 and 6.2)

WASH is the collective term of three core issues of Water, Sanitation and Hygiene, which due to their interdependent nature are grouped together to represent a sector (UNICEF, 2016). Several international development agencies have identified WASH as an area with significant potential to improve health, life expectancy, student learning, gender equality, and other important issues of international development (Kooy and Harris, 2012).

From a water resources management point of view, the WASH sector is a small user. Worldwide, the domestic sector uses about 10% of the appropriated water resources while agriculture (irrigation) and industry use 70 and 20% of that. However, these are global averages. Across the world there are many contexts where domestic water use is proportionally much higher (in the absence of other water using sectors). And even in the absence of these water guzzling sectors, domestic water demand can already exceed water availability, putting people in a situation of water stress. Additionally, WASH water use is fundamentally different from the other uses in the sense that it requires continuous high-quality water availability for people in order to meet health standards.

WASH, seen from the donor perspective, often appears to be driven by agendas/policies that aim to improve health and basic development, while reducing poverty. However, in WASH

Case study: The importance of upstream Atewa forest for WASH services provisioning in Accra, Ghana

The case of the Atewa forest nicely illustrates how WASH services provisioning is linked to water and land resources management. The forest forms the so-called water tower for three key Ghanaian rivers: the Ayensu, Densu and Birim. The mountainous area of Atewa receives a large amount of precipitation. The combination of the creek system and lush vegetation creates a spongy function resulting in steady flow of rather high-quality water into these river systems. More than five million people, including most of the inhabitants of Accra, as well as industrial and agricultural activities depend on this steady freshwater supply.

The area is also rich in mineral resources like bauxite and gold. In its quest for building a stronger and diverse Ghanaian economy, the government of Ghana is exploring the potential for intensive mining to generate increased foreign exchange and revenue. In addition to this plan for mining, other ongoing human activities are taking place in the Atewa forest like illegal artisanal mining, farm encroachment and logging.

It is thought that this combination of pressures will lead to a wide level of deforestation, soil erosion, loss of local biodiversity and ecosystems services. With a loss of forest cover, the Atewa region will be unable to form the spongy buffer to provide a continuous flow of freshwater. Instead, downstream areas would need to adapt to high discharges in the rainy season while expecting low flows during the dry season. The increase in soil erosion would silt up downstream reservoirs and be abrasive to water infrastructure. If the planned mining activities do not strictly follow environmental safeguards, it is expected that chemical pollution of the river would become a fact. Under such a scenario, it is not hard to imagine that drinking water provisioning will become technically more difficult to achieve and probably more expensive.

Increasingly, the people of Ghana are concerned about the sustainability of planned development in the Atewa forest, and how costs and benefits will be distributed over different groups. CSOs representing local communities (who are depending on the forest's ecosystem services) but also representing WASH customers downstream have mobilised themselves in networks trying to influence the policies. They have commissioned studies assessing the impacts of the mining. A recent cost benefit analysis that explicitly factors in the values of ecosystem services found that conserving the forest and its watersheds will provide higher long-term benefits compared to exploitation of the area for mineral resources.

The case of Atewa includes almost all the SDG6 elements. It relates the drinking water provision downstream to water quality aspects and the wise use of water resources upstream. It illustrates how healthy ecosystems are essential in freshwater development and how IWRM-like approaches are needed to find optimal trade-offs between upstream activities and downstream impacts.



Wastewater treatment: improving water quality helps to sustain downstream communities and ecosystems. Photos by Creative Commons CC0

implementing countries this does not necessarily mean that it is placed in the Ministry that is responsible for those issues. From our experiences WASH may fall under:

- Ministries of Health – though by now in most countries water has moved out of health, but sanitation may still fall under health
- Ministries of Environment, e.g. in Uganda
- Ministries of Water (i.e. Ministries looking at all water uses)
- Ministries of Housing – as WASH is also related to development of human settlements
- And in some instances the Ministry of Public Works – but then it tends to have a very strong engineering and development focus.

Dedicated ministries for drinking water and sanitation and health are rare (with India being an exception). Often various aspects of WASH are covered by different ministries, where sometimes sanitation is covered by a different ministry than the one governing drinking water (this is the case in Mali where drinking water is within the Ministry of Energy and Water and Sanitation is in the Ministry of Environment, Sanitation and Sustainable Development). It is rarely the case that all WASH activities are governed within the same ministry that also deals with IWRM and environmental issues.

Because of its essential importance for the survival for people, WASH is supported by the Human Right to Water and Sanitation (HRWS) and recognised as a human right by the United Nations (UN) General Assembly on 28 July 2010. This rights-based

approach provides hooks to connect WASH to proper IWRM and water quality management as it also comes with duties for governments to respect, protect and fulfil of these rights. This includes the protection of water sources from pollution by third parties (e.g. industries) by means of appropriate legislation controlling waste emissions.

The roles and particular positions of women and girls related to WASH cannot be overlooked and has been extensively described by the WASH sector. IWRM (see section 2.4) also acknowledges the gender importance of water resources management (CAP-NET, GWA 2014).

2.2 Water quality aspects of water security (target 6.3)

Wastewater treatment and the protection of water quality seem to be the least developed parts of WASH and IWRM in many countries. UNEP (2006) concludes that severe pathogen pollution already affects around one-third of all river stretches in Latin America, Africa and Asia, putting hundreds of millions of people (especially rural) at risk on these continents. The immediate cause of increasing water pollution is the increase in wastewater loading to rivers, lakes, wetlands and groundwater systems, from sources such as sewerage hook-ups with no or a low-level of treatment. 80% of global wastewater is still untreated before it enters water or land systems (Corcoran et al., 2010). CAP-NET (2005) concludes that, "Past sanitation systems often focused on removing the waste problem from the areas of human occupation, thus keeping the human territories clean and healthy,

but merely replacing the waste problem, with often detrimental environmental effects elsewhere...Pollution of sources from which domestic supplies are derived is a critical issue, leading in the worst case to serious health problems and in the best to increased water treatment costs...The fact that the water supply sector is itself most often responsible for polluting drinking water sources, especially for downstream users, highlights an internal management problem or discontinuity in management structures."

The Lancet Commission on Pollution and Health (2017) reported that next to air pollution, pollution of water, often with sewage, causes the second highest number of pollution deaths (1.8 million deaths per year as a result of gastrointestinal diseases and parasitic infections). The total number of pollution-related deaths is estimated at 9 million per year, exceeding deaths caused by smoking, natural hazards, wars and conflicts, and diseases like malaria, HIV and cancer. 92% of all pollution-related mortality is seen in low and middle-income countries, with the greatest number of deaths from pollution-related disease occurring in rapidly developing and industrialising lower middle income countries. The researchers estimated the welfare losses from pollution at 4.6 trillion USD a year, equivalent to more than 6% of global GDP.

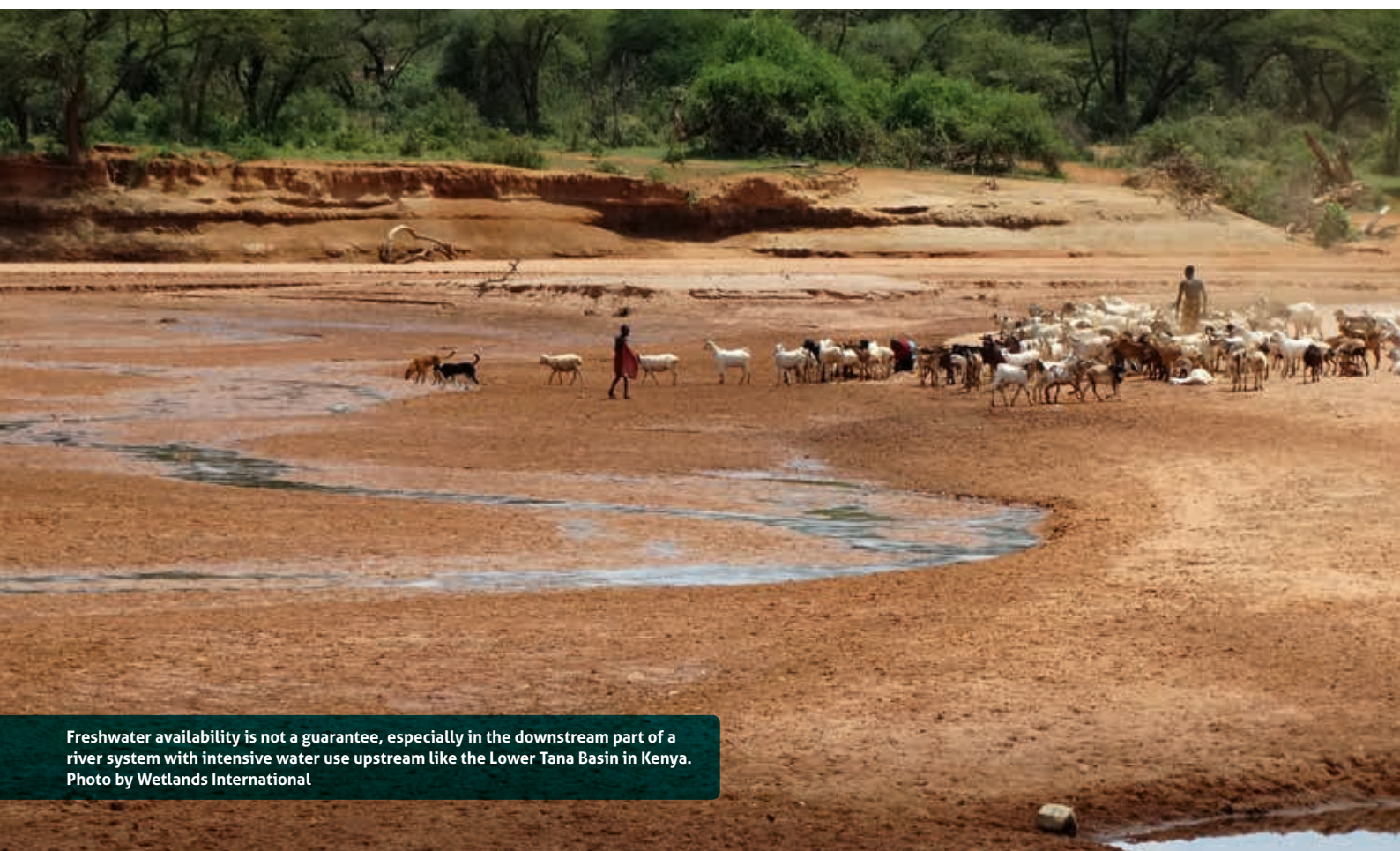
In van Vliet et al. (2017), the authors argue that a shift is needed towards the availability of water of acceptable quality for use in each sector rather than looking merely at water quantity. For example, they found that including just water temperature in

assessments of water scarcity leads to an increase in percentage of the world's population under severe water scarcity from 34% to 37%, compared to assessments of only water quantity. There are obviously more quality parameters critical for different water uses like salinity, nutrients, organic pollutants, pathogens, and other pollutants that would increase the water scarcity percentage much more – especially when look at drinking water use which needs high quality water.

Another WASH aspect which could benefit from a stronger linkage to IWRM is dealing with water-related and vector-borne diseases. Water-related vector borne diseases (like schistosomiasis and malaria) are often related to stagnant water bodies and poor water quality. Both stagnancy and water quality are often related to human activities mostly external to the institutes that deal with WASH itself. Hence connecting WASH with the wider IWRM sector that e.g. can make decisions on minimal flows that reduce the prevalence of stagnant water and flush out pollution will help to reach WASH targets.

2.3 Water use aspects of water security (target 6.4)

One of the criticisms of conventional WASH is that it is focused on the provisioning of sufficient water for drinking and other domestic uses, but does not cover additional water demands people have to improve their livelihoods. According to van Koppen, et al. (2009), such single-use approaches to water



Freshwater availability is not a guarantee, especially in the downstream part of a river system with intensive water use upstream like the Lower Tana Basin in Kenya. Photo by Wetlands International

development and management do not reflect the realities of poor people's water use. People use domestic water supply for activities such as irrigating backyard gardens, keeping livestock, fishing, processing crops and running small-scale enterprises (IWRM, 2006). At the same time, when domestic water delivery is insufficient, people will resort to water use that was originally developed for other uses such as irrigation. This multiple use of water is currently better recognised in the WASH sector and has formed a clear link with IWRM.

The WASH sector has recognised possible climate change impacts on services delivery like increased demand, migration and hence water demand patterns, changes in water availability due to changes in precipitation and temperature patterns. Johannessen et al (2014) identify strategies for investments by public and private partnerships (PPPs) based on an enhanced understanding of how the resilience of WASH systems to water-related hazards (e.g. floods and water scarcity) can be improved. Batchelor et al. (2011) state that there is however a tendency for politicians and also WASH professionals to blame the problems of WASH services delivery on climate change, often with no clear justification. Similarly, climate change has also become a convenient "scapegoat" for WASH services providers in explaining poor services delivery. Moreover, the climate change agenda tends to take hostage the entire water security agenda, marginalising the non-climate change related causes of water availability and quality, and extreme water events. The relative impact of climate change needs to be considered against the demands and threats to water resources from increasing wealth and consumption, and a growing population (Pittock et al., 2008).

2.4 IWRM as an approach to manage water security (target 6.5)

Integrated water resources management (IWRM) has been defined by the Global Water Partnership (GWP) as "a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems". IWRM should first of all be seen as a paradigm, an ecological critique to a too utilitarian focussed use of water supply and discharge (the so-called, hydraulic mission which started in the 1950's). IWRM can be traced back to UN's Mar del Plata conference of 1977, which reflected the sign of the times by raising concerns about environmental sustainability and introducing the principle of the 'carrying capacity' of the natural environment into the arena of water development. IWRM, in its most fundamental way, "just" consists of a set of principles (adopted in Dublin in preparation for the 1992 'Earth Summit' held in Rio de Janeiro):

The Dublin Principles, at that time, truly kick-started a new water movement and discourse on how to manage water resources. Unfortunately, the related Action Agenda is little-referenced, despite being rather visionary in linking issues like climate change, disaster risk reduction and urbanisation, and seeing the so-called enabling environment as a crucial part to address these concerns. More than ever, such an integrative approach appears salient and similar thinking has now been integrated into the

- Principle 1: Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment
- Principle 2: Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels
- Principle 3: Women play a central part in the provision, management and safeguarding of water
- Principle 4: Water has an economic value in all its competing uses and should be recognised as an economic good.

SDGs. While the Action Agenda explicitly identifies the reduction of poverty and disease (thereby strongly focusing on WASH) as the first key benefit of applying the Dublin principles, IWRM and WASH seem never to have been in a happy marriage. A further explanation of the Dublin principles and the related Action Agenda can be found in Annex 2.

Although IWRM should be seen merely as a paradigm, many countries have tried in the past decades to institutionalise IWRM in some way or another with policy development and institutional reform. A good example of how that worked out for South Africa is given by Movik et al. (2016). By now, one in three countries have implemented IWRM in some form (UN-Water 2012) and in those countries IWRM has often become a water (sub) sector in itself, consisting of professionals and organisations dedicated to establishing institutions for water resources management, working on approaches for allocating water between sectors, with dedicated line agencies responsible for this. Whereas there is strength in IWRM having people and organisations behind it, it also means that IWRM is not just a set of principles applicable to all water using sectors. And it also comes with the perception within those other sectors – such as WASH – that IWRM is something taken care of by others instead of something that needs to be incorporated in their own practices.

Shah and van Koppen (2006) argue that in countries with mainly informal economies like India and South Africa, the normal IWRM package of basin-level management, property rights reform, water pricing, and the development of catchment management agencies is unlikely to stick. Copying IWRM, which can be found in highly organised countries in Western Europe with sufficient public funding to finance expensive monitoring schemes and research as well as management agencies full of highly trained experts, will likely fail in countries without such capacities. Shah and Van Koppen also argue that IWRM has concentrated on demand management and better sharing of the available resources, while further water resources development on the supply side is still feasible and necessary in many parts of sub-Saharan Africa. Hence the environmental sustainability agenda that was established at IWRM's birth seems to sometimes view people more as possible environmental perpetrators instead of people in need for water resources. In the past, water problems were dealt with in isolation and the human dimension was taken into account as an 'external' boundary condition – traditional water management can be characterised as a 'command and control' approach (Pahl-Wostl and Sendzimir, 2005).



Irrigation is often essential for food production but sometimes competes for scarce water resources, resulting in dried-up shallow drinking water wells. Irrigation returns flows loaded with excess fertilizer and pesticides which may create serious water quality threats necessitating costly extra water treatment steps. Photo by Creative Commons CC0

While IWRM promotes the so-called subsidiarity principle of putting the management of water resources at the lowest level possible, it is often perceived (Allouche, 2016; Butherworth et al., 2010) to work mostly at higher levels of scale, on policy and legislation reforms at national level, and on the establishment of river basin organisations. It is thought that the optimal balance of centralised “planned and command” versus organically grown bottom-up approaches needs to be found for each of the contexts where IWRM is being used. Centralised IWRM approaches may be able to deal with externalities better while localised approaches may provide robust solutions that fit the local realities. Bottom-up approaches may also come with their limitations, such as capture by local elites that complicates the desired level of equity, narrow visioning and goal setting, and difficulty establishing effective participatory approaches between local level governmental entities and civil society. Moriarty (2004) puts IWRM as a way of thinking (or a paradigm), where instead of attempting to control all aspects of water management through one system, the task is to help many different water managers to understand and take account of the wider implications of their actions and to collaborate more effectively.

Target 6.4 also promotes transboundary water management. Some contexts merit a transboundary approach to safeguard WASH services delivery in catchments and river basins. Water pollution caused by accidental or intentional spills of contaminating chemicals can easily travel hundreds of kilometres downstream. Upstream water storage and diversion may result in low flow conditions and resulting pockets of stagnant

water bodies. The impacts of the Farakka barrage in India on downstream Bangladesh have been extensively studied among others by Kawser and Samad (2016) and clearly illustrate the transboundary scale of water issues. Reduced river discharges due to the upstream diversion from this barrage and other water infrastructure in the Ganges, contribute to increased salinization of water bodies in the deltaic coast of Bangladesh. Other river basins across the globe manifest similar issues. Transboundary water management between countries, and also between federal states or other lower-scale governmental entities is increasingly needed to secure downstream WASH services delivery.

2.5 Ecosystem Management (target 6.5)

Earlier approaches towards the management of water and land resources tended to follow instrumental, predict and control processes dominated with often technical, end-of pipe, solutions. Although this approach contributed much to development, it also resulted in highly modified ecosystems which are unable to absorb uncertainties resulting from climate change (Pahl-Wostl et al., 2008). In the water security discourse, the importance of healthy ecosystems in supporting livelihoods and development is now fully acknowledged. The discourse explicitly recognises the links between ecosystems and the way society uses and manages water resources. UNEP (2009) highlighted various ecosystem services and goods people can benefit from when living in healthy landscapes and ecosystems. The Nature Conservancy report, “Beyond the source” (Abell et al., 2017) considers healthy source watersheds as a vital infrastructure that store and filter

water and provide benefits for biodiversity conservation, climate change adaptation and mitigation, food security, and human health and well-being for an estimated 1.7 billion people living in the world's largest cities.

Herrera et al. (2017) argue that based on statistical relationships between health, socioeconomic factors, climate, and watershed condition of 293,362 children in 35 countries that higher upstream tree cover in a catchment is associated with lower probability of diarrheal disease downstream in rural areas. They conclude that maintaining natural capital within watersheds can be an important public health investment, especially for populations with low levels of built capital. Bauch et al., (2015) combined municipal-level panel data on diseases, public health services, climatic factors, demographics, conservation policies, and other drivers of land-use change in the Brazilian Amazon. They found that malaria, acute respiratory infection, and diarrhoea incidence are significantly and negatively correlated with the area under strict environmental protection.

Wetlands are one of the ecosystems in watersheds that particularly play a role in sustaining water security. Besides providing fish, water and fibres, wetlands tend to provide additional services which create favourable conditions for sustainable WASH services delivery. For example, wetlands tend to dampen flood waves propagated through river floodplains after heavy precipitation of wet monsoons which reduces downstream flood risks. Coastal wetlands like mangroves can significantly reduce wave force and negative impacts from disasters like typhoons, sea surges and even tsunamis. Some wetlands act like sponges in the landscape taking up large volumes of water during the wet season and slowly releasing it again during the dry season, delivering a minimal baseflow in river systems needed for ecosystem survival. The linkages between wetlands and WASH have extensively been described by Wetlands International (2010):

1. For some communities living adjacent to wetlands, the wetlands may be the sole source for drinking water and an essential natural unit in WASH provisioning.
2. Wetlands have the possibility to regulate hydrological flows and store large amounts of freshwater that can be used for human consumption and other activities. In this aspect, the wetlands function as a natural reservoir.
3. Wetlands have a natural attenuation potential to purify water and treat various kinds of waste(water). In that aspect wetlands form an essential natural infrastructure for waste treatment in WASH. Increasingly, the natural attenuation capacity of wetlands ecosystems is being incorporated in engineered wastewater treatment systems. Increasingly, artificial wetlands are being constructed with the purpose of wastewater treatment and/or combined with engineered and more conventional treatment.
4. Wetlands have the ability to absorb floods and may help reduce their natural hazard potential, increasing the resilience of people and systems in the wetlands and downstream.
5. Additionally, wetlands provide various kinds of provisional services such as fish, fodder and fibres that help people build sustainable livelihoods.

NRDC (2014) states that "WASH, fresh water conservation, and climate are inextricably linked. Many fresh water ecosystems that provide the water needed for WASH are at risk due to pressure from land-use change, population growth, and climate change. Improper disposal of human waste is also deteriorating fresh water ecosystems, meaning that WASH is important for the environment". USAID also acknowledges that freshwater ecosystems and climate resilience are critical for the long-term sustainability of WASH projects, and that water is one of the key resources that will be affected by climate change. The Africa Biodiversity Collaborative group (ABCG, 2013) say that "long-term sustainability of WASH services depends on the conservation and protection of the broader watershed and the wise management of built infrastructure. It also requires that such infrastructure is resilient to future changes in water use and climate patterns".

The Wetlands International report clearly warns for negative linkages. Still, too often wetlands are considered to be possible waste sinks for disposal of domestic (and other types of) untreated waste. People's reasoning is that when the waste is being dumped away from their living area it may not cause harm anymore. In water bodies with large flows, waste gets transported downstream (out of sight) and /or diluted, reducing health hazards (at least from the point where it was introduced into the waters system. However, overloading of wetland systems with pollutants can result in high toxicity leading to enormous human health hazards, even further downstream. It can also negatively affect the ecological functioning of wetlands, creating toxic environments for organisms or changing ecological balances resulting in poorer ecosystem service delivery.

Leendertse et al. (2008) looked into how IWRM has helped to improve environmental management. According to their study covering various case studies across the world, IWRM has certainly helped to bring environmental management more to the forefront. This was especially the case where IWRM was developed in a bottom-up process and the natural environment was a concern to local people. In cases where IWRM was developed more top-down, and it had narrowed itself down to sectorial negotiations on water allocation, environmental issues were often only weakly represented. Adoption of relatively new concepts such ecosystem services and natural accounting would support a more sustainable and environmentally aware type of IWRM.



Ecosystems provide services to people like fish, navigation, a place to live, wastewater collection and possibly even freshwater such as this wetland in Laos. Photo by Wetlands International

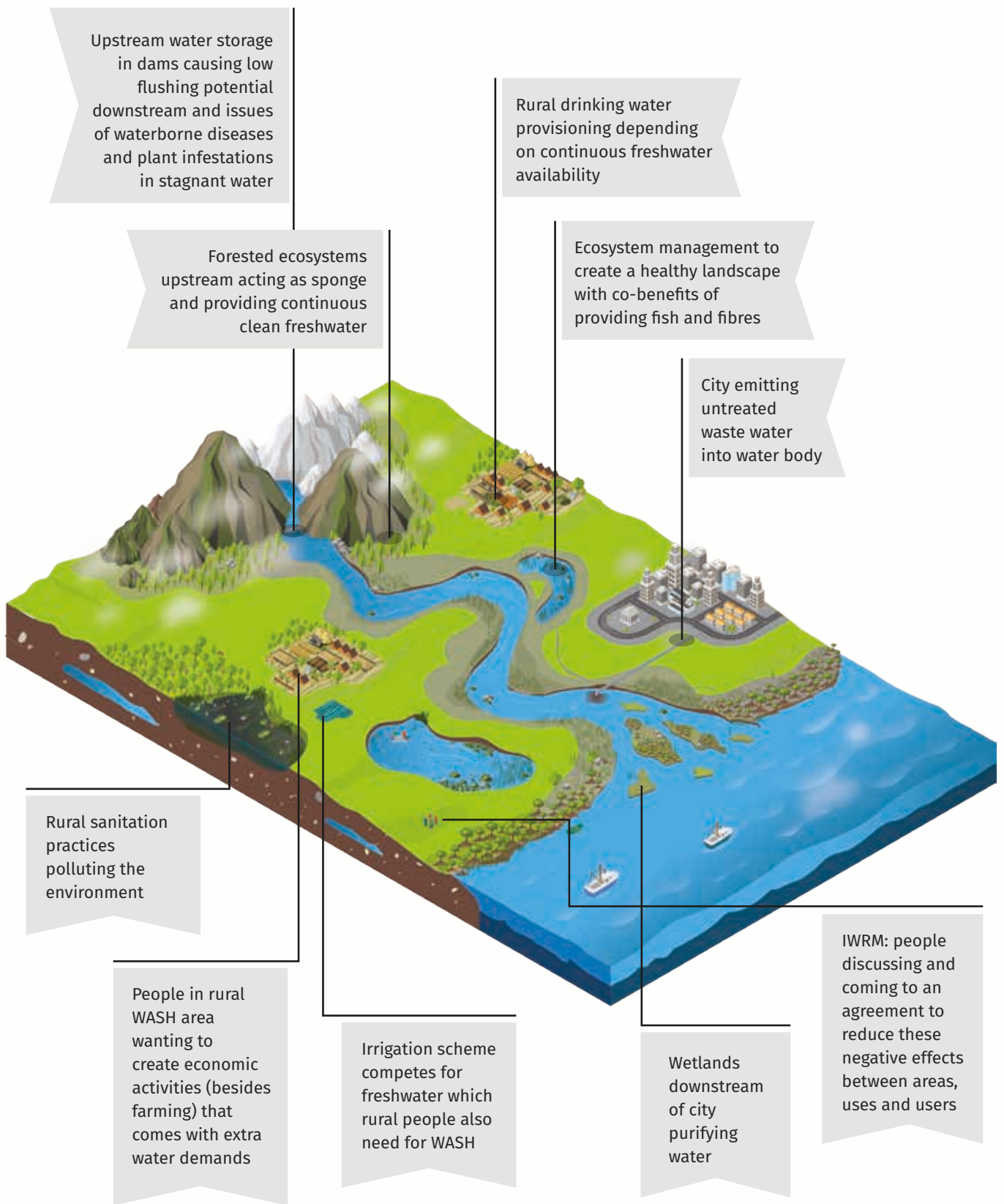
Case study: Rwambu forest and wetlands in Uganda

In the not so distant past, the people of Rwambu, a hilly, originally lushly vegetated region in Uganda, were up against a quickly shrinking water table. This was largely created by agricultural expansion on the steep hill slopes and bad management of the wetland. Water no longer sufficiently saturated the ground and erosion occurred all over. As a result, water supply, both for drinking and household needs, was in very short supply. Women and children were forced to walk two hours down the hillsides to the wetland in the valley to access water. Poor sanitation practices led to waterborne diseases such as dysentery and typhoid fever. The community was not organised and their plight seemed hopeless to some. Community engagement was not prioritised by the district authorities, nor was the wetland incorporated into environmental management plans.

From 2012 to 2015 Wetlands International collaborated with the RAIN Foundation and a local NGO partner Joint Effort to Save the Environment (JESE) in the Rwambu catchment. The project started out by raising awareness on the role the Rwambu wetlands play in WASH service delivery, and how activities of both the local community and local authorities impact this. In just a few years, the community was trained and organised, and together with the district authorities, different ecosystem-based solutions were implemented to restore and sustainably manage the Rwambu wetland, relying on the labour and materials of the community.

Through this participatory approach, the district authorities not only recognised the value of the Rwambu wetlands, but also that communities are vital for innovation in planning and monitoring. Within the Rwambu catchment, this resulted in a mandatory involvement of communities in IWRM activities, and for the first time, the inclusion of a small budget at the district level for IWRM and WASH implementation. Also, upstream of Rwambu in the upper and mid-catchments, district authorities have started to prioritise IWRM activities and are engaging local CSOs in the planning process.

Now Rwambu is used as an example in Uganda of how communities can engage with the government and manage their own water resources. Catchment planning with the engagement of communities is required at the national level (strongly promoted by GIZ, one of Uganda's key water and water governance donors), and both the approach and ecosystem-based solutions are being replicated in other catchments. Due to the success of Rwambu, JESE signed a Memorandum of Understanding with the Ugandan Ministry of Water and Environment, and advises the Ministry on how to engage communities in their IWRM activities and how to streamline IWRM in Uganda. This collaboration has resulted in the inclusion of the Rwambu approach in several national guidelines on water resources management and WASH services delivery.



Linkages between access to drinking water, competition for freshwater between different users, possible pressures on water quality resulting from poor sanitation and wastewater management, and the role of ecosystems in a catchment landscape.

How to integrate WASH with water security issues

3.1 It's all about water governance

Acknowledging that water issues are linked in the biophysical system, it is clear that water secure (and climate resilient) WASH services delivery requires a closer connection between those entities that are trying to solve such “adjacent” issues. There is increasing consensus that water crises like limited access to water and sanitation are actually water governance crises. OECD (2015) argues it is mostly a lack of political will and policy continuity, and the inability to create connections to other possible solution providers which leaves the complex myriad of water challenges unsolved. According to UNDP-SIWI's Water Governance Facility (2014), the water and sanitation crisis is mainly rooted in poverty, power and inequality and not in physical availability. It is, first and foremost, a crisis of governance. Inadequate resources management, corruption, lack of appropriate institutions, bureaucratic inertia, insufficient capacity and a shortage of new investments undermines the effective governance of water and sanitation in many places around the world. Pahl-Wostl (2008) argues that dealing with sustainability is not a matter of better understanding how ecological and/or technical systems work. It is about understanding how governance and cultural systems are structured and managed and how they interact with these ecological and technical systems.

Water governance usually refers to “the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society” (Global Water Partnership, 2003). Edelenbos and van Meerkerk (2015) argue that in order to be able to find sustainable solutions for complex interrelated water issues (such as suggested by the SDG-thinking), new forms of water governance and partnerships are needed involving many more stakeholders and disciplines. They see such a more integrative approach as a shift from:

- A uni-sectoral, to holistic, multi-sectoral interdisciplinary approaches.
- Hierarchical government-centric approaches towards horizontal poly-centric approaches like co-management and co-development.
- Technocratic, expert-driven approaches to multi-knowledge approaches including local and stakeholders' knowledge.
- A fixed, goal-oriented prediction and control towards a more flexible design and process-based adaptive management.

3.2 Integration, a challenging endeavour

If water governance is the solution to address all the various water issues more holistically, and the way forward is to create sustainable, water secure WASH services, it does mean new institutional arrangements are needed, with new framings of the issues at stake and new partnerships with all relevant actors (Pahl-Wostl et al., 2008). This is simpler said than operationalised. Often, most people and organisations are organised and structured such that they operate within a certain space. Such a space can be simplistically mentioned a physical space like an office or a geographical location. More widely it can also be seen as the space where they have mandate to operate, and where they feel comfortable to operate with like-minded people having the same interest. Water governance now asks people and organisations to redefine those spaces or at least to cross boundaries between those spaces. Hence one could perceive integration as crossing these (perceived) boundaries. The following reasons have been mentioned in the various consulted literature as to why the “WASH sector” and “IWRM sector” find it so difficult to integrate. Some of these reasons are already briefly touched upon in the previous sections:

- WASH and IWRM tend to serve different dimensions of development where WASH uses more values like human rights, health and poverty eradication while IWRM uses values like equitable sharing of scarce resources and environmental sustainability.
- WASH services ideally reach individuals or at least households or communities and hence activities and interactions are reaching grassroots scales. IWRM and ecosystem management are normally not considered as a basic service that needs to be provided on an individual citizen level. Nor are appropriate IWRM and ecosystem management yet underpinned by some accepted human right framework (Tremblay 2011, WGF, 2012). IWRM tends to remain on a level of interactions between sectors and departments.
- Since both sectors are based on different core values, this may have resulted in both sectors having incorporated staff with different worldviews constraining the ability to understand each other.
- WASH often uses administrative units as target areas while IWRM often takes a catchment or river basin boundaries as the delineation for their target area. IWRM often tends to work over larger spatial scales than WASH (OECD, 2015b).
- IWRM often applies much longer time horizons than WASH (hundreds of years instead of tens of years, it takes much longer to restore a wetland than to build wells and latrines).
- Engineered infrastructure used in IWRM such as dams often

require preparation times of tens of years to ensure sound environmental governance, come to a political agreement of the changed water allocation and to coordinate donor activities. There is normally little objection and political resistance to improve the health status of people through WASH. Therefore IWRM may need a different sort of buy-in and embedding into the society than WASH programmes (although sometimes WASH access or more precisely the non-access can be the result of intentional political and ethnic marginalisation).

- Although the practices of WASH and IWRM are linked, they use different scientific methodologies and technologies. Both sectors need well trained and often specialist types of staff. Such staff is likely trained again using different worldviews, and language (not to speak of jargon with lots of technical terms). The required specialism tends to constrain integration as it requires people to get out of their comfort zone.
- Having different worldviews and being trained with different technical backgrounds reduces the ability of people to trust “the other”. This happens on both the individual and organisational level.
- Vested interests and the potential risk of losing power are often mentioned as reasons not to connect more to other parties.
- WASH and IWRM are often institutionalised in separate streams, with different departments and ministries dealing separately with the sectors, and also a division of NGOs supporting the sectors (Gyawali, 2015). Inter-ministerial

cooperation tends to be difficult and this does not limit itself to developing countries. This silo-thinking does not just happen between departments or ministries but also within. Also within the corporate sector, inter-departmental turf-wars provide a challenge, making companies less effective and competitive (Gleeson 2013).

- There is little experience yet to work in this water governance-like fashion. Traditionally, water service provision and water resources management was organised by separate but single entity actors like a ministry or a federal bureaucratic agency designated to manage the issue in accordance with a centric perspective and clear cut administrative and mandate boundaries (Sternlieb et al., 2013).
- WASH and IWRM often use different funding streams. This separation is found across the board from International Finance Institutes (IFIs) and ministries in donor countries, to ministries in recipient countries and across organisations that implement water resources management, ecosystem management and the provision of services.
- While service provision can be seen as a private or a public economic good, many of the activities within IWRM and ecosystem management are more in the realm of common property-type economic goods (Zetland, 2011; Kornfeld, 2012). Financing of WASH services provision, IWRM and ecosystem management may therefore follow completely different economic models.
- With separate programmes and separate funding implemented by separate organisations, it is very likely that

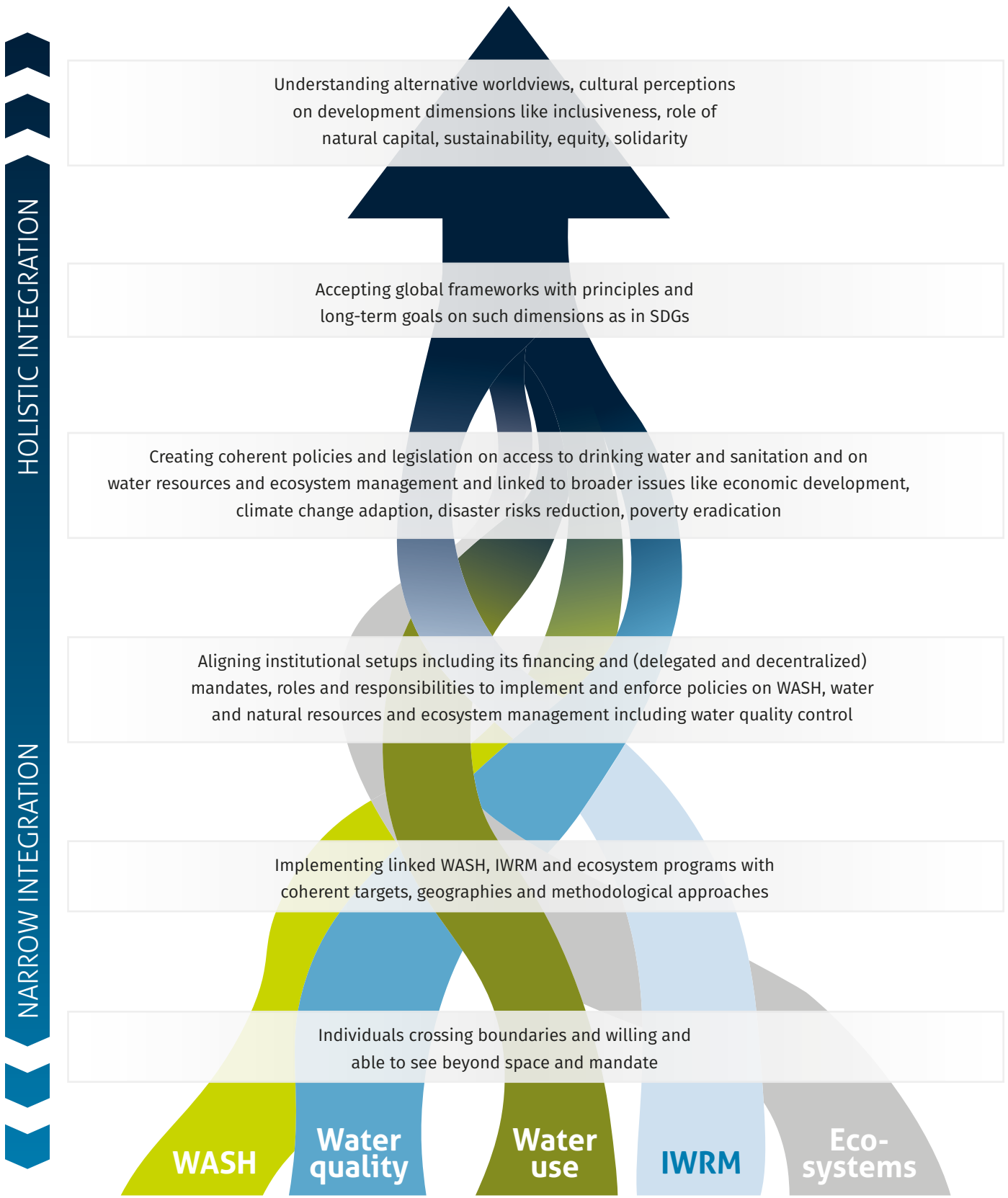
Case study: WASH and Water Security Integration in Dutch development cooperation

The Dutch government is a strong supporter of SDG6. Water is a key topic for the Dutch government, not only for water management in the Netherlands, but also in its foreign policies. In the area of international development cooperation, the Netherlands is a leading donor for programmes on water resources management and WASH. SDG6 requires alignment of WASH, water security and IWRM. But how are WASH and IWRM aligned in Dutch foreign policies and practices? What are obstacles and incentives for integration?

The Dutch Ministry of Foreign Affairs' policy on WASH connects WASH, the protection of ecosystems and water resources management, and recognises the need to consider links with water claims from other sectors such as agriculture and energy. It stipulates that investments in water supply and sanitation funded by the Ministry of Foreign Affairs will carry a 15-year sustainability clause, meaning that services are supposed to function for at least 15 years after construction or rehabilitation.

However, the practice seems more challenging than the theory and the foreseen integration is not yet much reflected on the ground. An evaluation from the Ministry's portfolio of WASH programmes found that only limited attention is paid to environmental issues and that they were only limitedly related to the contexts of water resources management and climate change. Lack of collaboration and lack of guidance are mentioned as key obstacles for alignment. Also, the Ministry is held accountable by the Dutch Parliament to deliver on WASH and water resources management as separate targets. Professionals and organisations working on WASH programmes are different from the ones working on water management and this complicates alignment. Government staff interviewed perceived the Dutch policies promoting holistic and integrative approaches as very abstract, not providing clear examples of how to reach an integrated state.

The Dutch Ministry of Foreign Affairs is taking steps towards reaching practical integration by e.g. dedicating internal team meetings to the issue of aligning WASH, water security and IWRM. And by developing an internal policy framework for improving the link between WASH and IWRM. Furthermore, it is building the capacity of Dutch embassies in developing countries to make this integration happen. A key success factor of these intermediate results is the personal commitment of the responsible WASH officer within the Ministry – a true boundary spanner.



Fully achieving the various linked sub-targets of SDGs would benefit from integration. This integration does not necessarily or immediately need to be a holistic sort of integration with coherent policies and merged institutions, but can start more narrowly with individuals willing and able to cross boundaries that normally demarcate the space in which they operate.

Case study: Health sector

WHO, 2017: "The factors that influence health outcomes are complex and extend well beyond the provision of health care services. Many also fall outside the authority of the health ministry. As a result, accountability for the progressive realisation of the right to health must be shared across government as a whole. Coordinated, intersectoral action to improve health, including between ministries, between various levels of government, and with stakeholders outside government, is necessary to address complex and persistent health challenges... There is no single blueprint for intersectoral action in health. Governments may choose to invest in several structures and processes that vary in scale and focus to address different goals and priorities... Intersectoral structures may also provide a solution when governments have already passed multiple pieces of legislation that overlap and share common goals, but which are administered across several ministries... Intersectoral initiatives may generate benefits that extend well beyond health. Public health leaders should consider how best to present the case for intersectoral action, remembering that collaboration with other sectors and ministries may be easier to achieve when initiatives are framed in terms of language, concepts, goals and values that are familiar or appropriate to that sector... A successful partnership across sectoral boundaries requires the active participation and goodwill of all partners. The political commitment of government to intersectoral action on health may be strengthened by formalising the partnership in a declaration, memorandum of understanding or another framework document. Such a commitment may even be formalised in the national constitution... Although helpful, declarations and statements of intent are not a substitute for action by governments. Governments must ensure that they take the concrete steps that are required to deliver on their promises, by enforcing public health laws, reforming and improving them and honouring human rights obligations. Governments should ensure that partnerships with the private sector, where appropriate, do not undermine their capacity to use legal and regulatory powers effectively to protect public health."

WHO (2017) identified a number of practical steps that may assist health ministries as they seek to realise the benefits of an intersectoral approach:

- Build understanding among health sector personnel of the need for an intersectoral approach to implement health priorities or to advance shared societal goals;
- Strengthen the capacity of health sector personnel to interact with and develop alliances with other Ministries;
- Use health impact assessment as a tool to identify how health department priorities will have an impact on the goals and interests of other ministries and their constituencies;
- Identify areas where interests are aligned, but be aware of areas where disagreements and rivalries could also arise. Create alliances where possible without undermining health goals;
- Identify existing structures and processes for cross-ministerial, intersectoral action and cooperation. Are these appropriate? Review existing laws and mandates for intersectoral action. Are they adequate? Identify new potential mechanisms for intersectoral cooperation. Seek high-level political support for these to be formalised and used;
- Be responsive to initiatives led by other sectors that provide opportunities for improving health and achieving health goals. For example, initiatives to improve food security, led by the agricultural sector, may also provide opportunities for improving diets, diversifying away from tobacco cultivation and supporting the cultivation of healthier oils;
- Choose the best method of collaboration for implementing each initiative, remembering that the most appropriate implementation strategies may vary according to the priority in question;
- Develop a strategy for engaging other sectors and ministries, and a common framework that assists all sectors and partners to understand the issues and the required actions;
- Support community participation in the development and implementation of health initiatives through public consultation, preparation of discussion papers, web-based tools and mass media;
- Look for ways to ensure political accountability through reporting requirements and access to information. Reporting mechanisms mandated by international agreements provide opportunities for reporting on government commitments and progress made in intersectoral activities;
- Monitor and evaluate the progress of intersectoral efforts to advance priority health goals, and identify and promote good practices.

monitoring frameworks for WASH, IWRM and ecosystem management use different sets of indicators.

Within the approach towards water governance, the capacity to connect to other domains, levels, scales, organisations and actors becomes crucial (Edelenbos and van Meerkerk, 2015). In the environmental governance literature, such boundary crossing is often called social learning. It is the learning that occurs when

people engage with each other, sharing diverse perspectives and experiences to develop a common framework of understanding and basis for joint action (Schusler et al 2003).

The transaction costs of integrating are perceived to be higher than the benefits which can be derived from it. A number of situations have triggered more integrative approaches towards WASH and water security:

- Hazardous events like droughts and floods.
- Policy windows of opportunity after the establishment of new constitutions (South Sudan in 2011, South Africa in 1966, new Water Law after Kenya's Constitution of 2010).

3.3 Integration comes in all shapes and forms

Integration may take place laterally across:

- Sectors resulting in inter-sectoral collaboration on WASH, IWRM and ecosystems management
- Aims and desired states (poverty reduction, health improvement, economic development, equitable sharing of resources, environmental sustainability, improving the good governance of resources use and decision-making that affect wealth distribution across regions, people and generations)
- Governments, NGOs, academia, the private sector (such as WASH technologies providers, competing water users, and investors) and civil society
- Target areas, programmes and practices

Integration can also take place vertically, both top down and bottom-up:

- From donors to recipient countries
- From agenda-setting platforms to grassroots-level initiatives
- From central to local government

Integration can take place in many forms and shapes and covers a spectrum. In its fullest and widest form integration is a full-fledged, joint planning across sectors starting with a joint vision (holistic view). However, integration does not necessarily mean merging sectors or one sector incorporating another sector completely, and may pragmatically only mean an occasional coordination (narrow view). Along the lines of Moriarty's definition

of IWRM (see section 2.4), integration starts with individuals understanding sectorial aims, strategies and practices, and about understanding each other's strengths and limitations. In this narrower view, it is more about a connective capacity.

The need for integration is not only limited to WASH and/or IWRM. The field of providing health services has for decades acknowledged that the health situation of people is dependent on many more factors than just the provisioning of health care services. Other social elements like poverty, employment, housing conditions and many others all contribute to the overall health situation and well-being of people. Therefore the health sector has been working on intersectoral cooperation. The guidance from the World Health Organisation in the case study below addresses these intersectoral initiatives and stresses the importance of the role of the government to direct this, as well as the need for regulations allowing this to happen, the importance of partnerships including NGOs and the private sector, and having a joint vision and goal.

Examples of integration for various development aims and hence sectors (going beyond just WASH-IWRM integration) can be found in the work of the African Biodiversity Conservation Group (2013). Their main concerns start with conserving biodiversity and the underlying ecosystems in remote areas of Africa. These are also the places where often people live that directly depend on the goods and services provided by these ecosystems. Often these communities living so remotely are the more marginalised and impoverished groups with poor access to adequate drinking water and sanitation. It makes sense to combine livelihood development by improving WASH services access with environmental management in these places.

Case study: Experiences from the African Biodiversity Conservation Group

Edmond et al., (2013) write that "At the World Summit on Sustainable Development in 2002, the WEHAB (water, environment, health, agriculture and biodiversity) concept was introduced, emphasising five priority pillars of sustainable development: water and sanitation, energy, health, agriculture and biodiversity (UNESCAP, 2004)...One such integrated approach is the concept of integrated water resource management (IWRM) whereby river basins/catchments are managed in a holistic manner. However, the IWRM approach does not have poverty alleviation as an explicit primary goal. Integrated Conservation and Development Projects (ICDPs) went a step in this direction to link conservation, not water resources specifically, with poverty alleviation under one banner. However, ICDPs were generally focused on single species or protected areas and did not take into full consideration the ecosystem at large. A new breed of integrated projects however was born out of the lessons learned during the ICDP era: population, health and environment (PHE) projects. PHE projects generally include a less complex and more targeted set of interventions than ICDPs, that include but are not limited to seeking synergistic outcomes in all three sectors through improving human health, ecosystem health and empowering women, often in partnerships between environmental and development or health organisations (Honzak, 2012). Donors find integrated PHE projects attractive as they can reach underserved populations in remote areas (regarding health programmes) and address long-term environmental threats, such as population growth. Population, Health and Environment (PHE) projects have been implemented over the last decade in order to meet the health and livelihood needs of remote or underserved communities while simultaneously ensuring the sustainability of the environment they are intrinsically dependent on. In many cases, conservation organisations integrate a health component into their programmes to simultaneously improve access to health services, especially family planning and reproductive health care (FP/RH), while also building community capacity to better manage natural resources. These integrated PHE approaches provide immediate and tangible results that will foster community goodwill and buy-in for the natural resource management components of the programme that tend to have long-term horizons".

3.4 Integration principles for making WASH more water secure

In the past decades, various organisations have developed criteria and guidelines which can facilitate integration between drinking water and sanitation services delivery and water resources management. Already in 1999, Visscher et al. developed working principles for IWRM and WASH based on IWRM's Dublin principles:

1. Catchment management and source protection are essential to ensuring sustainability of supply.
2. Water use efficiency and demand management must be addressed to minimise the need for new source development.
3. Multiple uses of water should be acknowledged and encouraged.
4. All stakeholders should be involved in decision making, but particular emphasis should be put on the active participation of users.
5. Gender and equity issues must be addressed throughout the project cycle.
6. Water provision should be priced so as to discourage wasteful use, while ensuring the right to access of a necessary minimum for all.

In 1998, The European Commission developed guidelines for use in planning, implementing and assessing water projects in the developing countries. In the heart of the tool is a series of detailed checklists that, for each stage of the project cycle, ensure that best IWRM practice is adopted. The Bellagio principles (SANDEC/WSSCC, 2000) and the Household Centred Environmental Sanitation (HCES) (Kalbermatten et al., 1999) approach can be seen as ways of applying IWRM principles to sanitation development.

Recognising the need to better link freshwater conservation and WASH initiatives, ABCG (Edmond et., 2013) developed criteria and guidelines with the purpose to provide guidance to health, development, and conservation professionals in sub-Saharan Africa on how to plan, coordinate, develop and achieve mutually supported WASH and freshwater conservation outcomes. ABCG's set of core guiding principles are included as critical elements to consider before developing and implementing integrated projects (See box).

The guidelines include the primary steps needed to design integrated WASH and freshwater conservation interventions, using the core principles as their foundation. The steps follow a common programme cycle approach and are:

1. Setting a common vision
2. Gathering information
3. Design
4. Implementation
5. Monitoring and evaluation

The Principles on Water Governance by OECD (2015) provide a menu of options, building on the diversity of legal, administrative and organisational systems within and across countries. They recognise that governance is highly contextual, that water policies need to be tailored to different water resources, uses, users and places, and that governance responses constantly need to adapt to changing circumstances. The principles are rooted in broader principles of good governance: legitimacy, transparency, accountability, human rights, rule of law and inclusiveness. As such, they consider water governance as a means to an end rather than an end in itself, i.e. the range of political, institutional and administrative rules, practices and processes (formal and informal) through which decisions are taken and implemented, stakeholders can articulate their interests and have their concerns considered, and decision-makers are held accountable for water management. The OECD principles can be found in Annex 2.

- a) WASH projects should protect or enhance ecosystem health and water-related ecosystem services, such as sustainable water quantity and quality.
- b) Conservation projects should incorporate/consider WASH goals that provide social/environmental benefits in conjunction with conservation goals.
- c) WASH and conservation programmes should promote resilience to future changes in water use, availability, and climate patterns through adaptive management of both natural and built infrastructure.
- d) Climate-smart siting, design and operation of built infrastructure should be utilised to conserve and protect the broader watershed for sustainable WASH services.
- e) Multi-level, multi-stakeholder engagement should be included for the adoption and long-term sustainable management of integrated WASH and conservation programmes.
- f) Stakeholder efforts to integrate freshwater conservation and improved WASH services should include gender sensitivity and a comprehensive approach to increase equitable access, participation and benefits among men and women, youth, elderly, and vulnerable groups.

Based on an assessment of 17 projects in the fields of community water, sanitation and hygiene and freshwater conservation within the Coca-Cola Waster Stewardship, 20 enabling conditions are distilled that are supposed to foster a more integrated approach. The conditions are grouped in the following categories and can be found in Annex 3:

- Local government relationships and involvement
- Legal Framework
- Cross-sector relationships
- Community involvement
- Supportive funding, timeframe and monitoring
- Implementing partner network to achieve integration
- Watershed visibility
- Demonstrated interdependency
- Watershed characteristics

What can CSOs do to achieve integration?

4.1 Roles of CSOs in society

The trend in many countries is for the delivery of WASH services and water resources management moving away from a government-centric, single knowledge, plan and control type of model towards a multi-knowledge, adaptive and flexible model involving many more stakeholders. Such a shift from a “water government” to water governance fits the current ideas about the importance of good governance to create inclusive and sustainable growth. It links to values where investments of the private sector such as water utilities and the decisions and operations of government entities such as the water ministry or river basin organisations or state-owned wastewater treatment plant should follow the rule of law, are demand-driven, inclusive and follow participatory approaches, are transparent and accountable and use resources like tax money effectively and efficiently. It is also about stakeholders crossing boundaries and integrating ideas, perceptions, goals and activities with those of other stakeholders.

Recognising that no one sector can solve the world’s major societal challenges like full WASH access and appropriate, equitable and sustainable sharing of scarce water resources alone, the spaces the governments, market and civil society traditionally occupy are getting more fluid. The boundaries between these spaces are getting blurred and the roles governments, the private sector and civil society play are getting more diverse. For example, private sector in some countries do not limit their role in providing particular commercial WASH services but additionally also invest in regional development next to the government and donors. Water Stewardship programs mix private funds with public funds to for example finance catchment management programs. Such private funding may serve various goals such as reducing water-related operational risks while at the same time creating goodwill and resilient clientele of services.

Following WEF’s categorisation of civil society roles this means that within the frame of WASH and water resources management, CSOs can be a:

- Watchdog: holding institutions to account, promoting transparency and accountability as in performing WASH budget tracking and organising satisfaction assessments among customers of sanitation services, or even bringing organisations to court when the rule of law is not followed.
- Advocate: raising awareness of societal issues and challenges and advocating for change such as the youth groups advocating for the conservation of the Atewa forest in Ghana for securing sustainable WASH services.

- Service provider: delivering services to meet societal needs such as the many groups implementing WASH programmes or performing operational management of IWRM infrastructure.
- Expert: bringing unique knowledge and novel technologies, such as nature-based solutions to water issues, to shape policy and strategy, and identifying and building solutions.
- Capacity builder: providing education, training and other capacity-building like building networks of CSOs that defend indigenous rights to water resources and use.
- Incubator: developing solutions that may require a long gestation or payback period like organisations promoting alternative ways of financing of WASH and water resources management.
- Representative: giving power to the voice of the marginalised or under-represented like all the work on gender-mainstreaming in WASH and the work on water access for pastoralists.
- Citizenship champion: encouraging citizen engagement and supporting the rights of citizens.
- Solidarity supporter: promoting fundamental and universal values such as those towards the Human Rights to Access Drinking Water and Sanitation.
- Definer of standards: creating norms and criteria that shape market and state activity, like the guidelines and criteria mentioned in section 3.4.

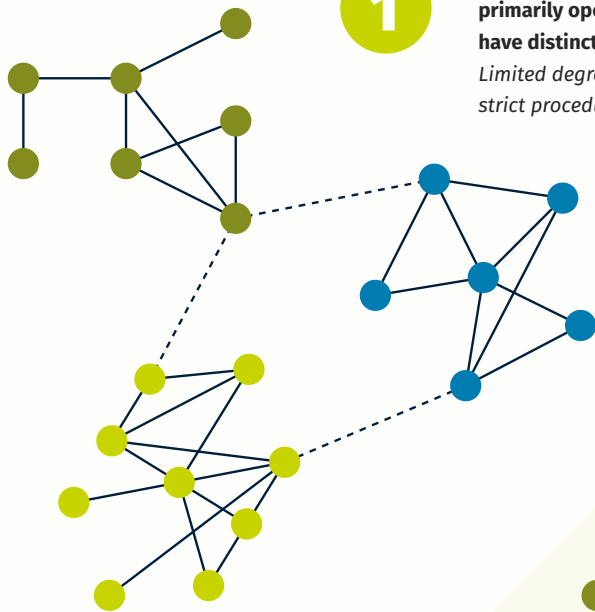
Water governance does not dismiss governments from their role and responsibility in delivering WASH services, and those services that guarantee healthy water resources and landscapes, including the sustainable and just allocation of scarce water resources. Ultimately governments remain the ultimate duty-bearer to create a safe and healthy landscape for people to thrive in. Political decision-making, developing and enforcing legislation around the topics of WASH and water security, the collection of taxes and public spending, as well as the implementation of policy instruments such as issuing abstraction and emission rights remains the sole mandate of the government. Water governance just means that all this is done in a more interactive fashion together with the private sector and civil society.

4.2 CSOs as boundary organisations

Another way of portraying the role of CSOs is seeing them as boundary organisations. As discussed earlier, integration is about connecting spaces or the blurring and crossing of boundaries between spaces that different stakeholders in the governance landscape of WASH and water resources management play. Boundary organisations are those organisations that perform tasks that are useful at both sides of a certain boundary

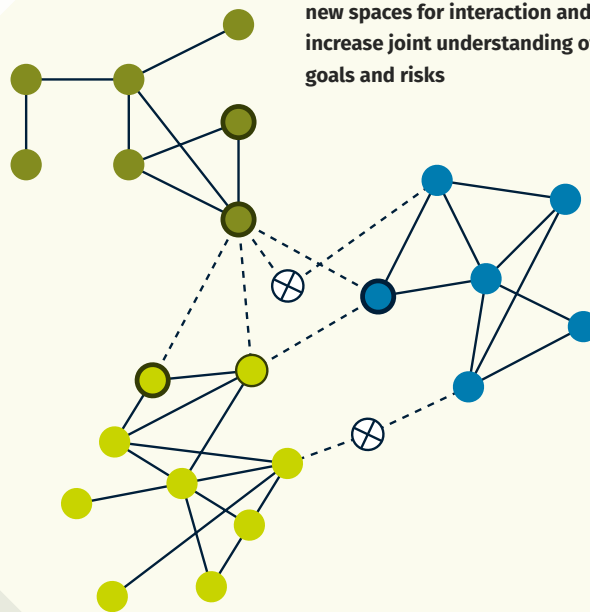
1

Government, private sector and CSOs primarily operate in own space and have distinct roles and responsibilities
Limited degree of interaction following strict procedures



2

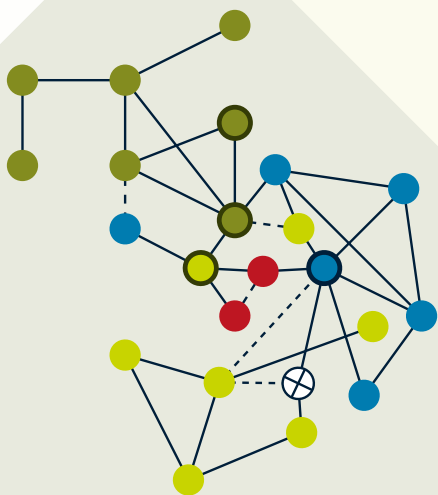
Boundary spanners and boundary organisations create new spaces for interaction and increase joint understanding of goals and risks



3

New framework of collaboration based on new intersections and trust

- *Blurring of roles*
- *New hybrid forms emerging (e.g. CSOs providing services and private sector helping to find solutions for societal issues such as WASH access)*
- *Greater capacity to address societal issues like WASH access and water security*



- Government
- Private sector
- CSO
- Boundary spanner
- ⊗ Boundary organisation
- New hybrid form

Adapted after WEF, 2013

Water governance: a transition from a situation in which governments, private sector and CSOs all work in their own spaces on WASH services delivery and on water resources and ecosystem management, towards a situation where these boundaries are crossed and roles get more diversified. Boundary organisations and spanners are crucial in creating the new interactions across boundaries.

and involve people from both spaces in their work, but play a distinctive role that would be difficult or impossible for organisations in either space to play (Guston, 2001).

Boundary organisations were often mentioned in the context of so-called science-policy interfacing. However, increasingly this term is used for those organisations that broker between science-policy-practice and investments. Such organisations are also sometimes called bridging organisations or intermediaries. Additionally, there are so-called boundary spanners within organisations. These are individual organisational members who are able to link the organisation they represent to its outer environment, that is to other stakeholders that operate at different levels, scales and in different spaces.

The key functions of such boundary organisations are:

- Linking people and their ideas, and interests from different spaces at both sides of a boundary like bringing district officers, WASH services providers and the beneficiaries together in lunch meetings;
- Selecting the relevant information that needs to be shared among them, like the quantified water needs of customers to the government or perceived under performance of WASH providers to the authorities;
- And translating the information to the other side of the boundary, like giving a simplified explanation of the duties and rights resulting from national water legislation so that citizens are informed and capacitated to make their own judgments.

CSOs are often well positioned and equipped to play such a boundary role. For example, they bring the interest and knowledge of citizens to the table with policymakers and translate that into policy-relevant options. Often this happens in informal spaces of interaction like workshops, or lunch meetings in which deliberation, social learning and innovation can take place. Moreover, boundary organisations play an important role in bridging between these informal places of interaction and formal decision-making structures. Or put differently, they bring the ideas that sprout from these informal water governance networks to formal structures in a legitimate way (Edelenbos and van Meerkerk, 2015).

The role of trust in social learning is important to mention in this respect. Trust is being able to predict what other people will do and what situations increase the probability that actors will invest their resources, such as money, knowledge, and so on, in collaborative and cross-domain and cross-disciplinary collaborative processes (Huntjes et al., 2011). In this way, trust stimulates learning and the exchange of information and knowledge among stakeholders, which is useful to develop better-tailored and integrated solutions. Interestingly, such trust seems to develop often in these informal spaces like workshops where CSOs bring together different stakeholders. It is especially in these environments where people, being outside of their box, and possibly free from control, open up to the ideas and interests of others. Hence CSOs may play an essential role in creating trust among partners which leads to more integrative approaches.

Additionally, CSOs would benefit from an increased trust invested into them, as not all governance environments are open to the role CSOs play in addressing societal issues. Numerous countries are restricting civil society space, particularly in the arena of advancing human rights or e.g. when addressing accountability of governmental water budget use. Steps to suppress or curb civil society freedoms include limiting access to national and foreign funding, erecting barriers to ICT communications, and deliberately complicating and delaying administrative registration processes (WEF, 2013).

4.3 The role of information

Bringing information from one space to the other is a key function of CSOs. Information (and the underlying data) forms an essential asset for any of the roles CSOs can play in society. By providing accessible information, bringing relevant actors together, and increasing collaboration, boundary organisations reduce the vulnerability created by a lack of information (or dissemination of misinformation) and non-cooperation between stakeholders. For example, in Bangkok CSOs brought local knowledge into DRR-thinking, greatly increasing the society's preparedness to deal with natural hazards (Bateman, 2013). Corfee-Morlot et al. (2011) argue that a good boundary organisation balances unspoken trade-offs by developing knowledge systems.

Another important function in creating good governance conditions is levelling the playing field by removing asymmetries in the access to information and understanding the knowledge. Not being able to appreciate information like policies or law text, or not being able to access information on policy-decisions taken or budget plans made, will put some parties at a bargaining power disadvantage. The key is then to create symmetric access to information and knowledge, and translate it such that it becomes comprehensible for all involved organisations. Creating a common language is part of this information brokering role. CSOs in the role as capacity builder will build capacities in all relevant stakeholder groups such that they are all equally able to understand the knowledge behind water issues and their proposed solutions.

Playing this role as an information and knowledge broker works best when the CSOs are seen as a trusted partner. To increase the appreciation and uptake of information generated and shared by them, it is important that it is perceived as credible, legitimate and salient (Posner et al., 2013):

- **Salience:** relevant and timely to the needs of the receiver.
- **Credibility:** the degree to which the information and knowledge arguments are trustworthy and based on agreed methods.
- **Legitimacy:** whether knowledge considers stakeholders' different points of view, as evidenced by the representation of diverse views in decision-making processes and whether the information is perceived as being fair and non-biased.



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The importance of having and using good information cannot be underestimated to be able to link WASH services delivery to wider water security issues. Photo by Akvo under Creative Commons license

WASH Integration Canvas

This section introduces the so-called WASH Integration Canvas. The canvas maps various examples of connecting stakeholders, departments, sectors, their interests, ideas, ways of working and resources in order to create a more integrative approach towards WASH and water security. It includes examples of integration which can be implemented at various governance levels and in different sub-fields of the enabling environment. Both holistic and narrower examples of integration are listed. Some of those integration solutions are straightforward and well-known, like breaking silos between ministries serving different sectors. Others are more novel and need to be experimented with, and are at this stage just food for thought.

It is assumed that CSOs may use the examples within this canvas to carry out policy influencing, advocacy and capacity building activities in the field of integrating WASH with the other SDG6 sub-targets. Depending on which role they normally play in addressing societal issues, and on which levels and enabling environment fields they operate, several of these integration examples may be of interest. Most CSOs in countries where WASH programmes are being implemented do not operate on international and worldwide scales. Therefore, examples of integration taking or needing to take place at the “higher” or beyond national governance levels are likely to be of lesser interest to CSOs.

The integration examples are intentionally described in a generic way in order to initially assume a wide applicability over a wide range of contexts. Some contexts favour a particular integration example more than others. It is up to the judgement of the reader whether a certain integration example may work for his or her context, or whether it needs contextualisation to become effective. Readers are encouraged to have this discussion with their peers.

5.1 The canvas

The canvas is a matrix with a vertical axis of different governance levels and a horizontal axis of different sub-fields of the enabling environment.

Vertical axis explanation

- The vertical axis starts with global organisations that can address issues on the global agendas and develop global frameworks and conventions. These are UN-like organisations such as UNICEF, UNEP, UNDP, UNISDR and UNESCO, as well as organisations like WaterAid, IWMI and the Ramsar Secretariat which are considered to be authoritative in the fields of WASH, IWRM and ecosystem management.
- The next level includes international donor organisations like the World Bank, and various regional development banks. It also includes the international aid departments in donor countries. A special reference is made to DGIS, Directorate-General for International Cooperation of the Dutch Ministry of Foreign affairs.
- A level lower includes national governments where national policies and budgets are made and decisions on lower-scale budget allocations and capacity building are being taken.
- District level governmental entities are key in operationalising the national policies and budget (also called service authorities). From a WASH implementation perspective, this is the most relevant governance level that WASH service providers will need to work with.
- WASH service providers are listed as a separate level. Depending on the context, WASH service providers are a mixture of governmental organisations, private sector parties like water utilities and NGOs (both local and international ones). IWRM and ecosystem management appears to still be more a governmental mandate, with fewer non-

governmental entities in this sector. However, in some local cases, traditional structures dealing with water and other natural resources do exist next to the governmental one. Where governmental capacity is truly lacking, sometimes NGOs step in for land and water management.

- CSOs play an important role in raising social and environmental issues to the level of political and investment discussions, and often play a role as boundary spanners and represent societal groups with limited voices.
- The users of WASH services or the beneficiaries of proper IWRM and ecosystem management at a community level are on the lowest governance level considered here. They are sometimes organised in so-called Water Resources Users Associations (promoted as a participatory mechanism in IWRM, they have different names in different countries) or Water Users’ Association (village-level management structure for operating, maintaining and managing WASH structures including fee collection). They are not considered to be CSOs as these are often government-driven and initiated entities that exist in order to manage grassroots level participation.

Horizontal axis explanation

The horizontal axis describes the degree of abstractness of the integration, going from frameworks and conventions to programmes and projects, and categorising different parts of the enabling environment.

- On the horizontal axis, global frameworks and conventions are the most abstract structures where integration can take place. The SDG framework is a clear example.
- At the next level are policies and legislation that govern WASH, water resources and ecosystem management. Such policies are present at various governance levels and are

often nested (national level policies directing lower scale policies at the district level). Policies could also be donor and private sector policies.

- Funding is an important part of the enabling environment and has a separate category.
- WASH programming is the most concrete field in which integration can take place.

5.2 Integration examples

Below is a list of examples for integrating WASH, IWRM and ecosystem management across various governance levels and in distinct parts of the enabling environment:

1) Obtain commitment at all governance levels towards SDGs

Ensure that SDGs (and particularly for WASH and Water Security SDG6) are fully accepted at all governance levels as they provide a holistic and integrated framework linking WASH issues to wider water security issues and ecosystem management. Ensure especially that the national government commits to it and that it monitors its progress in achieving the target using the right set of indicators.

2) Create support for developing human rights approach towards IWRM and ecosystem management

The national government commits itself to the human right to drinking water and acknowledges that defending such a right comes with the duty to protect water sources and hence with the duty to avoid water quality degradation. One could advocate to include into this right or add a new human right: the right for people to receive appropriate IWRM and ecosystem management; and to hold the government accountable for an equitable and sustainable sharing of water resources; and to keep landscapes healthy and people free of the risks of contamination; and ecosystems well-functioning so that they can continue to support livelihoods and economic development.

3) Reform curricula such that graduates know how to apply integrated approaches and to link with other sectors

National governments recognise that complex issues like providing sustainable WASH in water insecure and climate change affected areas requires a holistic approach implemented by a multidisciplinary or even interdisciplinary team. Curricula in the universities and training institutes should be developed such that the specialists at least start to have knowledge in a few neighbouring fields of work, and that besides specialists, generalists are also being trained. Context-specific tools, trainings and guidance should be developed such that they

address linkages between different parts of the biophysical and technical systems, the users and the way this is handled by governance.

4) Monitor and report on the (environmental) sustainability of WASH services

Those entities commissioning WASH services programmes create conditions that require monitoring and report on the environmental sustainability of WASH services. As an example, the Dutch Ministry of Foreign Affairs and UNICEF have started to include the so-called Sustainability Clause as a condition obliging programme implementers to sustain the delivery of WASH services for a number of years beyond infrastructure development (and project termination). Such a clause requires that WASH services implementers better anticipate water security issues when developing and implementing the programme.

5) Create integration by developing coherent policies and legislation

Donors and national governments should develop coherent policies that integrate various development issues as much as possible, and at least linking WASH, IWRM and ecosystem management. It could use the SDG framework but also other global frameworks such as those developed for climate change adaptation and disaster risk reduction as guidance. The policies should explicitly recognise the importance of healthy ecosystems and promote natural engineering (including ecosystem restoration) as workable solutions to deal with environmental issues. Coherent policies should come with indicators and a monitoring framework that can measure progress and the success of integration.

6) Develop the capacity to work more interactively through staff diversity

Recruit staff that is trained to work holistically and can work across different world views, normative frameworks, targets, interests and institutional operations related to WASH and water security. Recruiting a diverse staff helps to bring down boundaries within the organisation and often provides a wider solution space for complex issues. Having staff diversity also increases the possibility that an organisation is able to work with staff from other organisations with equivalent skills.

| | Conventions / Paradigm | Policy and institutions |
|--|---|--|
| Global platforms like UN | <ul style="list-style-type: none"> ✓ Obtain commitment at all governance levels towards SDG6 ✓ Create support for developing human rights approach towards IWRM and ecosystem management | <ul style="list-style-type: none"> ✓ Monitor and report on (environmental) sustainability of WASH services |
| Donors/DGIS | <ul style="list-style-type: none"> ✓ Obtain commitment at all governance levels towards SDG6 ✓ Create support for developing a human rights approach towards IWRM and ecosystem management | <ul style="list-style-type: none"> ✓ Reform curricula so that graduates know how to apply integrated approaches and to link with other sectors ✓ Monitor and report on the (environmental) sustainability of WASH services ✓ Create integration by developing coherent policies and legislation ✓ Develop the capacity to work more interactively through staff diversity |
| Central Government | <ul style="list-style-type: none"> ✓ Obtain commitment at all governance levels towards SDG6 ✓ Create support for developing a human rights approach towards IWRM and ecosystem management ✓ Stimulate curriculum reform | <ul style="list-style-type: none"> ✓ Reform curricula so that graduates know how to apply integrated approaches and to link with other sectors ✓ Monitor and report on (environmental) sustainability of WASH services ✓ Create integration by developing coherent policies and legislation ✓ Develop the capacity to work more interactively through staff diversity ✓ Form inter-ministerial and inter-departmental task forces ✓ Allow boundary organisations to glue and lubricate ✓ Ensure that all water policies have a priority allocation towards drinking water ✓ Secure WASH representation in IWRM relevant entities |
| District level | <ul style="list-style-type: none"> ✓ Obtain commitment at all governance levels towards SDG6 | <ul style="list-style-type: none"> ✓ Monitor and report on (environmental) sustainability of WASH services ✓ Develop the capacity to work more interactively through staff diversity ✓ Form inter-ministerial and inter-departmental task forces ✓ Secure WASH representation in IWRM relevant entities |
| WASH services providers and IWRM operations agencies | | <ul style="list-style-type: none"> ✓ Develop capacity to work more interactively by staff diversity ✓ Monitor and report on the (environmental) sustainability of WASH services ✓ Allow boundary organisations to glue and lubricate |
| CSOs | <ul style="list-style-type: none"> ✓ Obtain commitment at all governance levels towards SDG6 ✓ Create support for developing human rights approach towards IWRM and ecosystem management | <ul style="list-style-type: none"> ✓ Allow boundary organisations to glue and lubricate ✓ Create integration by developing coherent policies and legislation |
| Users organised at community level in WRUAs and WUAs | | <ul style="list-style-type: none"> ✓ Develop capacity to work more interactively by staff diversity ✓ Merge grassroot level entities that deal with WASH and water resources management |

Finance

WASH, water & ecosystem management programmes

- ✓ Allow programmers to combine WASH/IWRM funding

- ✓ Apply IWRM light
- ✓ Geographically Integrate WASH and catchment management
- ✓ Stimulate waste (water) management and recycling
- ✓ Apply Water Resources Audits when new WASH infrastructure is planned

- ✓ Allow programmers to combine WASH/IWRM funding
- ✓ Always check funding and investment coherence
- ✓ Experiment with Landscape financing
- ✓ Include environmental externalities in WASH tariffs

- ✓ Implement a water security and climate resilience certification system for WASH sector
- ✓ Apply IWRM light
- ✓ Geographically Integrate WASH and catchment management
- ✓ Stimulate waste (water) management and recycling
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- ✓ Stimulate MUS approaches
- ✓ Implement ecosystem-based solutions to WASH

- ✓ Always check funding and investment coherence
- ✓ Include environmental externalities in WASH tariffs

- ✓ Implement a water security and climate resilience certification system for the WASH sector
- ✓ Apply IWRM light
- ✓ Stimulate MUS approaches
- ✓ Use 3R and ecosan techniques to overcome water resources non-availability and reduce environmental pollution resulting from sanitation
- ✓ Make IWRM information available to WASH practitioners

- ✓ Always check funding and investment coherence

- ✓ Implement water security and climate resilience certification system for WASH sector
- ✓ Implement ecosystem-based solutions to WASH

- ✓ Stimulate MUS approaches
- ✓ Use 3R and ecosan techniques to overcome water resources non-availability and reduce environmental pollutions resulting from sanitation
- ✓ Implement ecosystem-based solutions to WASH

7) **Form inter-ministerial and inter-departmental task forces**

Develop technical committees, task forces and other structures where information is shared or decisions are taken in a joint fashion are useful. Allow such structures to operate with a sufficient mandate and resources. Staff teams in such a way that both specialists in knowledge, sectoral interest and approaches, and generalist and integrative approaches are well represented. In some cases, developmental issues that need a truly holistic approach involving multiple ministries are placed in the Office of the Prime Minister, or in the Office of the President to reduce ministerial power dynamics and capture.

8) **Allow boundary organisations to glue and lubricate**

Boundary organisations have the capacity and are given the credibility to form an integrative buffer between various sectors and between various types of organisations. They often are able to mediate between different interests and hence form a glue between sectors in the institutional landscape, while at the same time they are able to lubricate cooperation processes. Such organisations can help to develop a cross-sectoral partnerships between organisations that focus on WASH, IWRM and ecosystem conservation to engender joint ownership of the linkages.

9) **Ensure that all water policies have a priority allocation of water resources towards drinking water provisioning**

Ensure priority allocation for WASH in national IWRM policies and legislation that steers water allocation and in district allocation principles. Ensure that water demanding sectors and organisations (e.g. irrigation schemes, surface and groundwater utilising industries such as the extractive and energy sectors) understand the consequences of such priority allocation and are able to overcome periods of low water supply/availability towards them.

10) **Secure WASH representation in IWRM relevant entities**

Ensure adequate representation for the needs and voices of WASH in catchment management / river basin organisations and all other relevant agencies and organisations, that can have these IWRM functions. National governmental policies should be developed to ensure that such representation is followed.

11) **Merge grassroots-level entities that deal with WASH and water resources management**

Different sectors have organised “the last mile” to reach the many citizens in communities via village-based organisations. These organisations fulfil the participation agenda many sectors strive for and are often mandated to perform local management and operational tasks. WASH and IWRM tend to have their own village-based or community-based entities like Water User Associations, WUAs (for WASH) and Water Resources User Associations (WRUAs) for IWRM. These units are also known by other names. WUAs are often installed to operate and maintain WASH infrastructure and to manage it (such as fee collection). WRUAs are often used as a mechanism to organise citizen participation (see Dublin Principles). WRUAs have been installed and performed with various level of success. They are relatively weak organisations and it can be argued that they only function on lower levels of participation (as a mechanism to inform citizens rather than a co-production tool). With different development sectors working simultaneously in villages, often a multitude of such village-based organisations exist. Coordination between these organisations is not always strongly developed. Merging them is a possibility to create the needed integration.

12) **Implement a water security and climate resilience certification system for the WASH sector**

Design, implement and enforce a certification system for WASH services providers that ensures their commitment and ability to work towards water secure and climate resilient WASH. Such a commitment could include doing a water audit and sharing data with a central water database (see 20). It is underpinned by an enabling environment resulting from sector integration and policy coherence and supported by the priority allocation principle (9).

13) **Apply IWRM light**

Apply IWRM and ecosystem-based principles in development policies. Such an IWRM light approach (Butterworth et al., 2010) does not require heavy institutional development or reshuffling, nor strict administrative approaches. It just needs people aware of all the linkages and acknowledging that integrated approaches lead to better, more robust and cheaper solutions to developmental issues.

14) Allow programmers to combine WASH/IWRM funding

Donors should organise their administrative systems such that they can combine funding more easily across multiple targets or objectives and finance integrated programmes. For example DGIS (the Dutch International Cooperation of the Ministry of Foreign Affairs) has three key water targets (WASH, Water Productivity and IWRM) with each of them having a separate indicator to show progress and with separate budget lines connected to it. While such a separation of streams may improve accountability and transparency, it also appears to constrain the development of integrated programmes that both include WASH and IWRM. More flexible utilisation of budget streams should help civil servants and programme officers in donor organisations to develop more integrative programmes.

15) Always check funding and investment coherence

Like policy coherence, funding coherence is a minimal check to avoid sectors making investments that undermine investments in sustainable WASH services. Sometimes investments are made in a region to develop more sustainable WASH services while activities are also being financed that reduce the availability of clean water resources (e.g. because of intensive groundwater extraction for agriculture) or that pollute the environment in which people are trying to live and develop their landscape (e.g. by investing in industries without proper environmental protection checks). Investments are sometimes made in one sector but not in the other sector even when it is evident that both sectors would improve from new developments (e.g. WASH services in a certain area are improved while the ecosystem on which people have developed their livelihoods is strongly degraded. While people's lives are helped with better WASH, they cannot prosper as their livelihoods are constrained).

16) Experiment with Landscape financing

Landscape financing is an innovative mechanism for the integrated development of a larger geographical area (a landscape or sub-catchment) involving multiple programmes and stakeholders. Various financing mechanisms are possible, like the conventional transfers, taxes and tariffs (for WASH services delivery, groundwater pumping licenses, navigation licences). Water provision should be priced to discourage wasteful use, while ensuring the right to access of a necessary minimum for all. To this conventional mix also new sources of investments are added by including the private sector into the investment model. This could add mechanisms like the license to

operate, paying for natural resource use. Some companies like to act as landscape stewards and custodians and are willing to invest in managing the environment and the people living in it (this helps them to reduce operational risks, but especially builds a good image towards authorities and their customers). Combining all these possible investors may leverage the budget needed to finance truly integrative projects at this large scale. Strong regional managers are needed to facilitate such a process.

17) Include environmental externalities in WASH tariffs

People, organisations and sectors causing water resources depletion and water quality degradation often impact not only themselves but also other adjacent users. They are so-called environmental externalities. In water resources and environmental management, the costs of such externalities are often internalised through environmental taxes or in tariffs to generate the funding needed to effectively deal with these issues. A key principle often used is that the entity contributing the most to the environmental issue should pay the most for its mitigation, the so-called user pays and polluter pays principle.

18) Geographically Integrate WASH and catchment management integration

Donors and national governments combine WASH with catchment management programmes. Include catchment management and source protection in WASH programmes as they may ensure sustainability of supply. When investing in catchment management (to reduce loss of soil, nutrients and water) also invest in better WASH.

19) Stimulate waste (water) management and recycling

Wastewater treatment and faecal sludge management seem to be the least addressed parts in the sanitation chain. Many conventional WASH organisations do not have the technical capacities to appropriately handle the relatively more complex issue of waste management. As a result, pollution from untreated waste is becoming the highest risk for both people and nature in many parts of the world. This is especially the case in fast growing cities and towns with industrial development which lack the means to create waste treatment systems. Considering waste as a valuable resource from which nutrients and water can be derived may stimulate investments in better waste treatment processes. Overcoming obstacles to the widespread adoption of wastewater recycling and water-saving measures is a prerequisite for meeting the water challenges of the future (Grant 2012, UNEP 2016).

This includes strict implementation and enforcement of the regulations around emission controls for hazardous materials and removing the corruption around it. The potential of ecosystems for water purification services should be integrated into WASH wastewater treatment.

20) Apply Water Resources Audits when new WASH infrastructure is planned

A water resources audit assesses the water resources situation in the sub-catchment where new WASH services are established. It includes assessing current and future water resources availability and demand, possible risks of resources depletion and water quality degradation, and climate change risks for WASH services. Based on such an assessment, a better water secure and climate resilient WASH services provisioning system can be designed and implemented, and will help reduce the non-functioning of WASH infrastructure in future. A risk of trying to apply IWRM tools such as water audits too rigorously is that there is never 'enough' information, and hence it is never possible to decide. It is important to approach all tools (water audits, Environmental Impact Assessments (EIA), light IWRM tools, etc.) in a pragmatic fashion based on 'optimal ignorance' and 'maximum permissible uncertainty'. Often this means gathering existing information (reports, etc.) rather than spending money on expensive new primary data collection. In case new WASH infrastructure is installed and new data can be collected (borehole log, groundwater depth, water quality, yield, pumping test, current and project water demand covered by water point) it should be mandatory to share and store that data in an open-access national water repository.

21) Stimulate MUS approaches

Multiple use of water is a basic condition from which WASH programming should start. Understanding these multiple uses and acknowledging the current and future multiple water use demand allows for more robust planning and necessitates that different users groups coordinate. WASH programming should be based on a shared vision of the economic development of a community or region and create a clear action plan for how it will meet the water demands of such development. WASH services provisioning should piggy-back on irrigation development and water infrastructure development for corporate operations. Since MUS (Multiple Use Systems) may require much larger water volumes than for drinking water consumption only, a water resources management approach should be followed.

22) Use 3R and ecosan techniques to overcome water resources non-availability and reduce environmental pollution resulting from sanitation

Consider using so-called 3R methodologies to improve water availability and store water in the subsurface to overcome temporary water shortages. Water use efficiency and demand management must be simultaneously addressed to minimise the need for new source development. Ecological sanitation approaches reduce human health risks and environmental risks because of less faecal matter being introduced into water bodies, less artificial fertilizer is needed and there is a lower risk of leaching. It provides economic incentives to recycle nutrients and is a nice example of a circular economy. The role of renewable energy should also be mentioned here. Solar and wind-produced energy are particularly appropriate technologies that can fuel decentralised stand-alone drinking water purification and waste treatment systems.

23) Implement ecosystem-based solutions to WASH

Ensure that at all governance levels, ecosystems services to WASH services delivery are understood and acknowledged (integrate nature-based solutions in policies and ask for nature-based solutions in tenders). Implement policies and regulations that help to maintain environmental flows in wetlands to keep the ecosystems healthy so that it can sustain delivering water purification services to reduce stagnant water-related health risks, to flush out pollution and to help sustain all other services that wetlands deliver that support livelihoods. Consider the use of constructed wetlands as natural engineered systems for wastewater treatment and to develop co-benefits such as recreational areas, peri-urban green lungs and many more.

24) Make IWRM information available to WASH practitioners

Often IWRM institutions collect and analyse data on the hydrological systems. Such information can be very useful for designing new WASH programmes and to monitor possible risks to sustainable WASH services delivery. Data sharing should become a common practice.

Key messages

- 1) The competition for fresh water resources is increasing in many parts of the world, leading to declining water availability and quality. Freshwater ecosystems face pressure from unsustainable water withdrawals, increased climate variability, pollution and upstream infrastructure. Unsustainable WASH systems are a contributor to these problems.
- 2) It is crucial to include water security as part of sustainable WASH services delivery. This is acknowledged by Sustainable Development Goal 6 which includes targets on improved access to drinking water, sanitation, emission control and water quality protection, efficient water use and the role of IWRM and ecosystems management and restoration.
- 3) To solve this complex linkage of factors contributing to decreased water quality and availability, sectoral approaches need to be replaced with more integrative ones. Integration requires new forms of water governance and partnerships involving many more stakeholders and disciplines.
- 4) Effective integration requires organisations and individuals to cross boundaries between the sectors in which they traditionally operate and to exchange and share world views and methodologies, align institutional setups, develop coherent policies and financing, and plan integrative programmes on WASH, water resources management and ecosystem management with joint targets.
- 5) Integration should be used to solve complex issues which could otherwise not be solved with sectorial approaches. It is important to note that integration of, for example, WASH and IWRM is not an objective in itself as it often comes with transaction costs.
- 6) SDG6 integration needs to occur at all governance levels, from the global to grassroots. Furthermore, it needs to link government, market and civil society spaces to formulate and implement effective solutions to address the complex water issues.
- 7) Boundary or bridging organisations enable integration by creating informal spaces to exchange information and build trust. CSOs can play a key role as boundary organisations in facilitating integration within the water sector by bringing salient, legitimate and credible information on complex water issues and possible solutions to those informal spaces and creating equal access and understanding.
- 8) With respect to relating sustainable WASH services delivery with water security, CSOs should be a voice for citizens in standing for their basic human rights for safely managed water and sanitation, and the need for healthy ecosystems to sustain healthy life and economic development.

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A WASH would benefit from a stronger linkage to IWRM in order to deal with water-related and vector-borne diseases, often related to stagnant water bodies and poor water quality. Photo by Todd Anderson under Creative Commons license

Annex 1. The Dublin Statement on Water and Sustainable Development

The Dublin Statement on Water and Sustainable Development, Adopted January 31, 1992 in Dublin, Ireland International Conference on Water and the Environment

Scarcity and misuse of fresh water pose a serious and growing threat to sustainable development and protection of the environment. Human health and welfare, food security, industrial development and the ecosystems on which they depend, are all at risk, unless water and land resources are managed more effectively in the present decade and beyond than they have been in the past.

Five hundred participants, including government-designated experts from a hundred countries and representatives of eighty international, intergovernmental and non-governmental organizations attended the International Conference on Water and the Environment (ICWE) in Dublin, Ireland, on 26-31 January 1992.

The experts saw the emerging global water resources picture as critical. At its closing session, the Conference adopted this Dublin Statement and the Conference Report. The problems highlighted are not speculative in nature; nor are they likely to affect our planet only in the distant future. They are here and they affect humanity now. The future survival of many millions of people demands immediate and effective action.

The Conference participants call for fundamental new approaches to the assessment, development and management of freshwater resources, which can only be brought about through political commitment and involvement from the highest levels of government to the smallest communities.

Commitment will need to be backed by substantial and immediate investments, public awareness campaigns, legislative and institutional changes, technology development, and capacity building programmes. Underlying all these must be a greater recognition of the interdependence of all peoples, and of their place in the natural world.

In commending this Dublin Statement to the world leaders assembled at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992, the Conference participants urge all governments to study carefully the specific activities and means of implementation recommended in the Conference Report, and to translate those recommendations into urgent action programmes for water and sustainable development.

Guiding Principles

Concerted action is needed to reverse the present trends of overconsumption, pollution, and rising threats from drought and floods. The Conference Report sets out recommendations for action at local, national and international levels, based on four guiding principles.

Principle No. 1: Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment

Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or ground water aquifer.

Principle No. 2: Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels

The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.

Principle No. 3: Women play a central part in the provision, management and safeguarding of water

This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them.

Principle No. 4: Water has an economic value in all its competing uses and should be recognized as an economic good

Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

The Action Agenda

Based on these four guiding principles, the Conference participants developed recommendations which enable countries to tackle their water resources problems on a wide range of fronts. The major benefits to come from implementation of the Dublin recommendations will be:

Alleviation of poverty and disease

At the start of the 1990s, more than a quarter of the world's population still lack the basic human needs of enough food to eat, a clean water supply and hygienic means of sanitation. The Conference recommends that priority be given in water resources development and management to the accelerated provision of food, water and sanitation to these unserved millions.

Protection against natural disasters

Lack of preparedness, often aggravated by lack of data, means that droughts and floods take a huge toll in deaths, misery and economic loss. Economic losses from natural disasters, including floods and droughts, increased three-fold between the 1960s and the 1980s. Development is being set back for years in some developing countries, because investments have not been made in basic data collection and disaster preparedness. Projected climate change and rising sea-levels will intensify the risk for some, while also threatening the apparent security of existing water resources. Damages and loss of life from floods and droughts can be drastically reduced by the disaster preparedness actions recommended in the Dublin Conference Report.

Water conservation and reuse

Current patterns of water use involve excessive waste. There is great scope for water savings in agriculture, in industry and in domestic water supplies. Irrigated agriculture accounts for about 80% of water withdrawals in the world. In many irrigation schemes, up to 60% of this water is lost on its way from the source to the plant. More efficient irrigation practices will lead to substantial freshwater savings.

Recycling could reduce the consumption of many industrial consumers by 50% or more, with the additional benefit of reduced pollution. Application of the 'polluter pays' principle and realistic water pricing will encourage conservation and reuse. On average, 36% of the water produced by urban water utilities in developing countries is 'unaccounted for'. Better management could reduce these costly losses.

Combined savings in agriculture, industry and domestic water supplies could significantly defer investment in costly new water-resource development and have enormous impact on the sustainability of future supplies. More savings will come from multiple use of water. Compliance with effective discharge standards, based on new water protection objectives, will enable successive downstream consumers to reuse water which presently is too contaminated after the first use.

Sustainable urban development

The sustainability of urban growth is threatened by curtailment of the copious supplies of cheap water, as a result of the depletion and degradation caused by past profligacy. After a generation or more of excessive water use and reckless discharge of municipal and industrial wastes, the situation in the majority of the world's major cities is appalling and getting worse. As water scarcity and pollution force development of ever more distant sources, marginal costs of meeting fresh demands are growing rapidly. Future guaranteed supplies must be based on appropriate water charges and discharge controls. Residual contamination of land and water can no longer be seen as a reasonable trade-off for the jobs and prosperity brought by industrial growth.

Agricultural production and rural water supply

Achieving food security is a high priority in many countries, and agriculture must not only provide food for rising populations, but also save water for other uses. The challenge is to develop and apply water-saving technology and management methods, and, through capacity building, enable communities to introduce institutions and incentives for the rural population to adopt new approaches, for both rainfed and irrigated agriculture. The rural population must also have better access to a potable water supply and to sanitation services. It is an immense task, but not an impossible one, provided appropriate policies and programmes are adopted at all levels - local, national and international.

Protecting aquatic ecosystems

Water is a vital part of the environment and a home for many forms of life on which the well-being of humans ultimately depends. Disruption of flows has reduced the productivity of many such ecosystems, devastated fisheries, agriculture and grazing, and marginalized the rural communities which rely on these. Various kinds of pollution, including transboundary pollution, exacerbate these problems, degrade water supplies, require more expensive water treatment, destroy aquatic fauna, and deny recreation opportunities.

Integrated management of river basins provides the opportunity to safeguard aquatic ecosystems, and make their benefits available to society on a sustainable basis.

Resolving water conflicts

The most appropriate geographical entity for the planning and management of water resources is the river basin, including surface and ground water. Ideally, the effective integrated planning and development of transboundary river or lake basins has similar institutional requirements to a basin entirely within one country. The essential function of existing international basin organizations is one of reconciling and harmonizing the interests of riparian countries, monitoring water quantity and quality, development of concerted action programmes, exchange of information, and enforcing agreements.

In the coming decades, management of international watersheds will greatly increase in importance. A high priority should therefore be given to the preparation and implementation of integrated management plans, endorsed by all affected governments and backed by international agreements.

The enabling environment

Implementation of action programmes for water and sustainable development will require a substantial investment, not only in the capital projects concerned, but, crucially, in building the capacity of people and institutions to plan and implement those projects.

The knowledge base

Measurement of components of the water cycle, in quantity and quality, and of other characteristics of the environment affecting water are an essential basis for undertaking effective water management. Research and analysis techniques, applied on an interdisciplinary basis, permit the understanding of these data and their application to many uses.

With the threat of global warming due to increasing greenhouse gas concentrations in the atmosphere, the need for measurements and data exchange on the hydrological cycle on a global scale is evident. The data are required to understand both the world's climate system and the potential impacts on water resources of climate change and sea level rise. All countries must participate and, where necessary, be assisted to take part in the global monitoring, the study of the effects and the development of appropriate response strategies.

Capacity building

All actions identified in the Dublin Conference Report require well-trained and qualified personnel. Countries should identify, as part of national development plans, training needs for water-resources assessment and management, and take steps internally and, if necessary with technical cooperation agencies, to provide the required training, and working conditions which help to retain the trained personnel.

Governments must also assess their capacity to equip their water and other specialists to implement the full range of activities for integrated water-resources management. This requires provision of an enabling environment in terms of institutional and legal arrangements, including those for effective water-demand management.

Awareness raising is a vital part of a participatory approach to water resources management. Information, education and communication support programmes must be an integral part of the development process.

Follow-up

Experience has shown that progress towards implementing the actions and achieving the goals of water programmes requires follow-up mechanisms for periodic assessments at national and international levels.

In the framework of the follow-up procedures developed by UNCED for Agenda 21, all Governments should initiate periodic assessments of progress. At the international level, United Nations institutions concerned with water should be strengthened to undertake the assessment and follow-up process. In addition, to involve private institutions, regional and non-governmental organizations along with all interested governments in the assessment and follow-up, the Conference proposes, for consideration by UNCED, a world water forum or council to which all such groups could adhere.

It is proposed that the first full assessment on implementation of the recommended programme should be undertaken by the year 2000.

UNCED is urged to consider the financial requirements for water-related programmes, in accordance with the above principles, in the funding for implementation of Agenda 21. Such considerations must include realistic targets for the time frame for implementation of the programmes, the internal and external resources needed, and the means of mobilizing these.

The International Conference on Water and the Environment began with a Water Ceremony in which children from all parts of the world made a moving plea to the assembled experts to play their part in preserving precious water resources for future generations. In transmitting this Dublin Statement to a world audience, the Conference participants urge all those involved in the development and management of our water resources to allow the message of those children to direct their future actions.

Annex 2. OECD Principles on Water Governance

Principle 1. Clearly allocate and distinguish roles and responsibilities for water policymaking, policy implementation, operational management and regulation, and foster co-ordination across these responsible authorities.

To that effect, legal and institutional frameworks should:

- a) Specify the allocation of roles and responsibilities, across all levels of government and water-related institutions in regard to water
 - Policy-making, especially priority setting and strategic planning;
 - Policy implementation especially financing and budgeting, data and information, stakeholder engagement, capacity development and evaluation;
 - Operational management, especially service delivery, infrastructure operation and investment; and
 - Regulation and enforcement, especially tariff setting, standards, licensing, monitoring and supervision, control and audit, and conflict management;
- b) Help identify and address gaps, overlaps and conflicts of interest through effective co-ordination at and across all levels of government.

Principle 2. Manage water at the appropriate scale(s) within integrated basin governance systems to reflect local conditions, and foster co-ordination between the different scales.

To that effect, water management practices and tools should:

- a) Respond to long-term environmental, economic and social objectives with a view to making the best use of water resources, through risk prevention and integrated water resources management;
- b) Encourage a sound hydrological cycle management from capture and distribution of freshwater to the release of wastewater and return flows;
- c) Promote adaptive and mitigation strategies, action programs and measures based on clear and coherent mandates, through effective basin management plans that are consistent with national policies and local conditions;
- d) Promote multi-level co-operation among users, stakeholders and levels of government for the management of water resources; and,
- e) Enhance riparian co-operation on the use of transboundary freshwater resources.

Principle 3. Encourage policy coherence through effective cross-sectoral co-ordination, especially between policies for water and the environment, health, energy, agriculture, industry, spatial planning and land use through:

- a) Encouraging co-ordination mechanisms to facilitate coherent policies across ministries, public agencies and levels of government, including cross-sectoral plans;
- b) Fostering co-ordinated management of use, protection and clean-up of water resources, taking into account policies that affect water availability, quality and demand (e.g. agriculture, forestry, mining, energy, fisheries, transportation, recreation, and navigation) as well as risk prevention;
- c) Identifying, assessing and addressing the barriers to policy coherence from practices, policies and regulations within and beyond the water sector, using monitoring, reporting and reviews; and
- d) Providing incentives and regulations to mitigate conflicts among sectoral strategies, bringing these strategies into line with water management needs and finding solutions that fit with local governance and norms.

Principle 4. Adapt the level of capacity of responsible authorities to the complexity of water challenges to be met, and to the set of competencies required to carry out their duties, through:

- a) Identifying and addressing capacity gaps to implement integrated water resources management, notably for planning, rule-making, project management, finance, budgeting, data collection and monitoring, risk management and evaluation;
- b) Matching the level of technical, financial and institutional capacity in water governance systems to the nature of problems and needs;
- c) Encouraging adaptive and evolving assignment of competences upon demonstration of capacity, where appropriate;
- d) Promoting hiring of public officials and water professionals that uses merit-based, transparent processes and are independent from political cycles; and

- e) Promoting education and training of water professionals to strengthen the capacity of water institutions as well as stakeholders at large and to foster co-operation and knowledge-sharing

Principle 5. Produce, update, and share timely, consistent, comparable and policy-relevant water and water-related data and information, and use it to guide, assess and improve water policy, through:

- a) Defining requirements for cost-effective and sustainable production and methods for sharing high quality water and water-related data and information, e.g. on the status of water resources, water financing, environmental needs, socio-economic features and institutional mapping
- b) Fostering effective co-ordination and experience sharing among organisations and agencies producing water-related data between data producers and users, and across levels of government;
- c) Promoting engagement with stakeholders in the design and implementation of water information systems, and providing guidance on how such information should be shared to foster transparency, trust and comparability (e.g. data banks, reports, maps, diagrams, observatories);
- d) Encouraging the design of harmonised and consistent information systems at the basin scale, including in the case of transboundary water, to foster mutual confidence, reciprocity and comparability within the framework of agreements between riparian countries; and
- e) Reviewing data collection, use, sharing and dissemination to identify overlaps and synergies and track unnecessary data overload.

Principle 6. Ensure that governance arrangements help mobilise water finance and allocate financial resources in an efficient, transparent and timely manner, through:

- a) Promoting governance arrangements that help water institutions across levels of government raise the necessary revenues to meet their mandates, building through for example principles such as the polluter-pays and user-pays principles, as well as payment for environmental services;
- b) Carrying out sector reviews and strategic financial planning to assess short, medium and long term investment and operational needs and take measures to help ensure availability and sustainability of such finance;
- c) Adopting sound and transparent practices for budgeting and accounting that provide a clear picture of water activities and any associated contingent liabilities including infrastructure investment, and aligning multi-annual strategic plans to annual budgets and medium-term priorities of governments;
- d) Adopting mechanisms that foster the efficient and transparent allocation of water-related public funds (e.g. through social contracts, scorecards, and audits); and
- e) Minimising unnecessary administrative burdens related to public expenditure while preserving fiduciary and fiscal safeguards.

Principle 7. Ensure that sound water management regulatory frameworks are effectively implemented and enforced in pursuit of the public interest, through:

- a) Ensuring a comprehensive, coherent and predictable legal and institutional framework that set rules, standards and guidelines for achieving water policy outcomes, and encourage integrated long-term planning;
- b) Ensuring that key regulatory functions are discharged across public agencies, dedicated institutions and levels of government and that regulatory authorities are endowed with necessary resources;
- c) Ensuring that rules, institutions and processes are well-co-ordinated, transparent, non-discriminatory, participative and easy to understand and enforce;
- d) Encouraging the use of regulatory tools (evaluation and consultation mechanisms) to foster the quality of regulatory processes and make the results accessible to the public, where appropriate;
- e) Setting clear, transparent and proportionate enforcement rules, procedures, incentives and tools (including rewards and penalties) to promote compliance and achieve regulatory objectives in a cost-effective way; and
- f) Ensuring that effective remedies can be claimed through non-discriminatory access to justice, considering the range of options as appropriate.

Principle 8. Promote the adoption and implementation of innovative water governance practices across responsible authorities, levels of government and relevant stakeholders, through:

- a) Encouraging experimentation and pilot-testing on water governance, drawing lessons from success and failures, and scaling up replicable practices;
- b) Promoting social learning to facilitate dialogue and consensus-building, for example through networking platforms, social media, Information and Communication Technologies (ICTs) and user-friendly interface (e.g. digital maps, big data, smart data and open data) and other means;
- c) Promoting innovative ways to co-operate, to pool resources and capacity, to build synergies across sectors and search for efficiency gains, notably through metropolitan governance, inter-municipal collaboration, urban-rural partnerships, and performance-based contracts; and
- d) Promoting a strong science-policy interface to contribute to better water governance and bridge the divide between scientific findings and water governance practices.

Principle 9. Mainstream integrity and transparency practices across water policies, water institutions and water governance frameworks for greater accountability and trust in decision-making, through:

- a) Promoting legal and institutional frameworks that hold decision-makers and stakeholders accountable, such as the right to information and independent authorities to investigate water related issues and law enforcement;
- b) Encouraging norms, codes of conduct or charters on integrity and transparency in national or local contexts and monitoring their implementation;
- c) Establishing clear accountability and control mechanisms for transparent water policy making and implementation;
- d) Diagnosing and mapping on a regular basis existing or potential drivers of corruption and risks in all water-related institutions at different levels, including for public procurement; and
- e) Adopting multi-stakeholder approaches, dedicated tools and action plans to identify and address water integrity and transparency gaps (e.g. integrity scans/pacts, risk analysis, social witnesses)

Principle 10. Promote stakeholder engagement for informed and outcome-oriented contributions to water policy design and implementation, through:

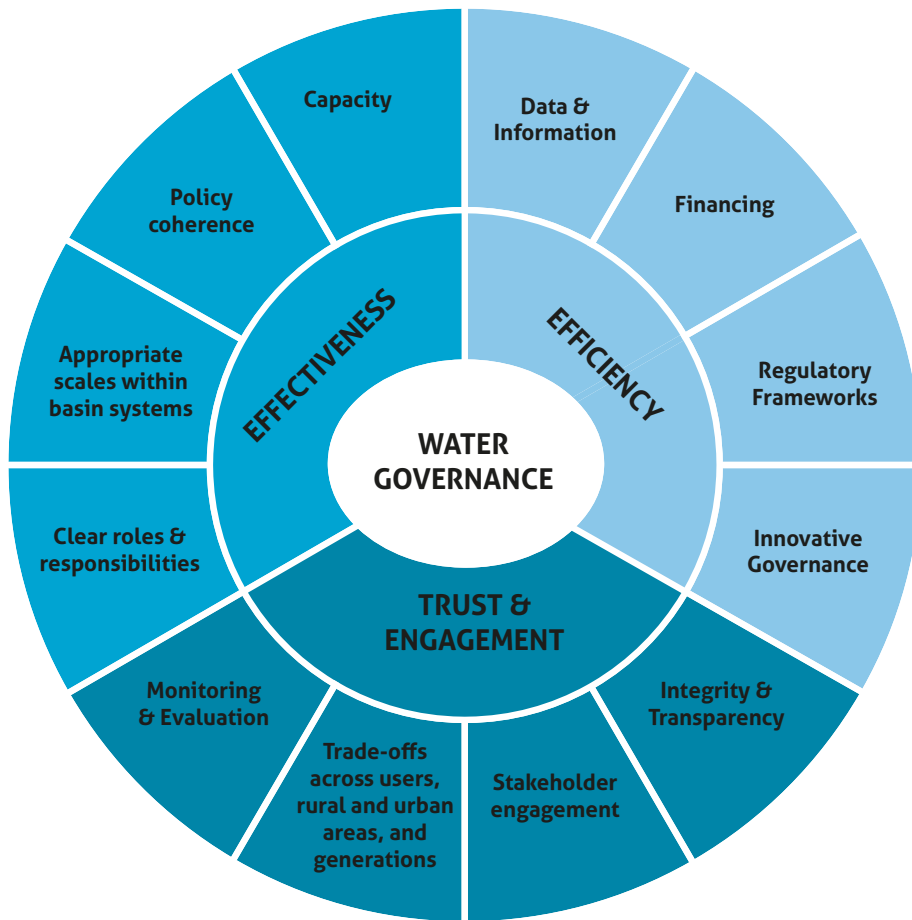
- a) Mapping public, private and non-profit actors who have a stake in the outcome or who are likely to be affected by water-related decisions, as well as their responsibilities, core motivations and interactions;
- b) Paying special attention to under-represented categories (youth, the poor, women, indigenous people, domestic users) newcomers (property developers, institutional investors) and other water-related stakeholders and institutions;
- c) Defining the line of decision-making and the expected use of stakeholders' inputs, and mitigating power imbalances and risks of consultation capture from over-represented or overly vocal categories, as well as between expert and non-expert voices;
- d) Encouraging capacity development of relevant stakeholders as well as accurate, timely and reliable information, as appropriate;
- e) Assessing the process and outcomes of stakeholder engagement to learn, adjust and improve accordingly, including the evaluation of costs and benefits of engagement processes;
- f) Promoting legal and institutional frameworks, organisational structures and responsible authorities that are conducive to stakeholder engagement, taking account of local circumstances, needs and capacities; and
- g) Customising the type and level of stakeholder engagement to the needs and keeping the process flexible to adapt to changing circumstances.

Principle 11. Encourage water governance frameworks that help manage trade-offs across water users, rural and urban areas, and generations, through:

- a) Promoting non-discriminatory participation in decision-making across people, especially vulnerable groups and people living in remote areas;
- b) Empowering local authorities and users to identify and address barriers to access quality water services and resources and promoting rural-urban co-operation including through greater partnership between water institutions and spatial planners;
- c) Promoting public debate on the risks and costs associated with too much, too little or too polluted water to raise awareness, build consensus on who pays for what, and contribute to better affordability and sustainability now and in the future; and
- d) Encouraging evidence-based assessment of the distributional consequences of water-related policies on citizens, water users and places to guide decision-making.

Principle 12. Promote regular monitoring and evaluation of water policy and governance where appropriate, share the results with the public and make adjustments when needed, through:

- e) Promoting dedicated institutions for monitoring and evaluation that are endowed with sufficient capacity, appropriate degree of independence and resources as well as the necessary instruments;
- a) Developing reliable monitoring and reporting mechanisms to effectively guide decision-making;
- b) Assessing to what extent water policy fulfils the intended outcomes and water governance frameworks are fit for purpose; and
- c) Encouraging timely and transparent sharing of the evaluation results and adapting strategies as new information become available.



Annex 3. Enabling Conditions for integrated projects, Coca-Cola, 2015

Local Government Relationships and Involvement

- A. Implementing organizations should have existing relationships with the appropriate government bodies (ministries of environment, health, sanitation, etc.) at the following levels: local, municipal/district, and national.
- B. Government leaders should have confidence in the project's objectives and be involved.
- C. The appropriate level of government should contribute to funding a portion of the project.

Legal Framework

- D. The legal framework of the country should enable work at the watershed or basin level.
- E. The institutions should be in place to enable work at the watershed or basin level.

Cross-Sector Relationships

- F. Implementing organizations should have relationships with or the ability to engage: local water service providers and water use sectors (such as agriculture or industry).

Community Involvement

- G. Implementing organizations should have relationships with the local community and involve them in the decision-making process for the project.
- H. The local community should be willing to invest financially in the interventions (especially WASH).
- I. The local community should have experience maintaining other types of interventions and demonstrate an ability to maintain additional integrated interventions.
- J. The local community should be willing to implement both WASH and freshwater conservation interventions.
- K. The local community water user committee should have strong governance and administration of funds.

Supportive Funding, Timeframe, and Monitoring

- L. Funders of integrated projects should be confident in the value of an integrated approach and willing to support longer project timeframes that do not provide instantaneous results.
- M. Funds should be deliberately allocated to both the WASH and freshwater conservation objectives of the project.
- N. Monitoring and evaluation frameworks should incorporate measures for both WASH and freshwater conservation objectives and encourage implementing organizations to demonstrate the value of integration.

Implementing Partner Network to Achieve Integration

- O. Implementing organizations should build a network of implementing partners with the required range of skill sets and expertise to implement an integrated WASH and freshwater conservation project.
- P. Implementing organizations should establish the specific roles and actions necessary to achieve integration and rely on specific guidelines or a third party to track progress toward achieving this integration objective.

Watershed Visibility

- Q. There should be high visibility or attention paid to important water-related areas in the community (e.g. due to conflict related to poor resource management, high demand from a populated area, a frequent and direct interaction between the community and the watershed, cultural significance, etc.).

Demonstrated Interdependency

- R. Interdependency should exist such that the freshwater conservation intervention is required to accomplish an objective of the WASH intervention that the WASH intervention could not achieve in itself (or vice versa).

Watershed Characteristics

- S. The project should be located where there are lower barriers to success.
- T. The watershed should be relatively easy to trace, define, and determine the hydrogeological characteristics.

Watershed

empowering citizens

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