UN WATER

A Post-2015 Global Goal for Water:

Synthesis of key findings and recommendations from UN-Water

Final - approved by SPM meeting 27 January 2014

UN-Water is the United Nations (UN) inter-agency mechanism for all freshwater and sanitation related matters. It provides the platform to maximize system-wide coordinated action and coherence and serves UN Member States in their efforts towards achieving development goals related to freshwater and sanitation.

This paper is the result of a broad technical consultation process among UN-Water Members and Partners, as well as a range of other stakeholders. It proposes a set of potential targets and indicators to support a dedicated global goal for water and is conceived as a contribution to the Sustainable Development Goals (SDG) consultation process as well as to the discussions on the post-2015 development agenda. The paper draws upon multiple sources including, but not limited to, the reports of the UN Secretary General's High Level Panel of Eminent Persons on the Post-2015 Development Agenda (HLP), the UN Sustainable Development Solutions Network (SDSN), the UN Development Group (UNDG), the Budapest Water Summit, the Open Working Group on Sustainable Development Goals (OWG), as well as the results of the numerous thematic, national and regional stakeholder consultations.

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Suggestions for a global goal for water

Water's fundamental importance for human development, the environment and the economy needs to feature prominently in the new post-2015 development agenda. UN-Water and its partners have therefore come together to develop these suggestions for a dedicated global goal for water, '*Securing sustainable water for all'.* This is intended as a constructive contribution to current discussions on the new development agenda and how water related issues are incorporated into it. The framework for this global goal for water is designed to promote human well-being, economic prosperity and the preservation of environmental capital. The framework thus contains all three dimensions of sustainable development - social, economic and environmental.

The proposal aims to support the protection of water resources from over exploitation and pollution while meeting drinking water and sanitation needs, energy, agriculture and other uses. It further aims to protect communities from water-related disasters. It supports the realization of the human right to safe drinking water and sanitation as well as other rights including those to life, of the child, of an adequate standard of living, and health. The proposal is a key building block for sustainable development, underpinning all other efforts to eradicate extreme poverty by 2030. It proposes targets and related indicators that will help countries to reach the goal by 2030. It illustrates the costs and benefits of doing so and discusses means of implementation. The diagram below shows the suggested goal and the key interlinked targets.

The proposed global goal for water seeks to be universally applicable while responding to specific national circumstances. It is designed to be tailored to the contexts and priorities of each country. Implementing this goal for water should create social, economic, financial and other benefits that greatly outweigh its costs. These benefits will extend well beyond the water domain as it is normally understood. The development of health, education, agriculture and food production, energy, industry and other social and economic activities all depend on the effective management, protection and provision of water and the delivery of safe water supply and sanitation services. Communities also need protection from the dangers that water-related hazards can present.

Meeting the goal will call for improved water governance and actions in the realms of policy-making, legislation, planning, coordination, and administration. Tools for project preparation, monitoring, and management will also need to be developed to enable effective implementation to take place. All this will require enhanced institutions and human capacities at all levels.

Supporting targets

The global goal for water is supported by a coherent, cohesive and mutually reinforcing set of targets. Used together these would enable the global goal to be met. To facilitate understanding of the multiple functions water plays in society, the framework is structured into five measurable and interconnected targets. The short versions of these targets are:

A. Achieve universal access to safe drinking water, sanitation and hygiene
B. Improve by (x%) the sustainable use and development of water resources in all countries
C. All countries strengthen equitable, participatory and accountable water governance
D. Reduce untreated wastewater by (x%), nutrient pollution by (y%) and increase wastewater reuse by (z%)
E. Reduce mortality by (x%) and economic loss by (y%) from natural and human-induced water-related disasters

These short versions are provided for ease of communication. More detailed text and the complete and operative wording of these targets, together with indicators for monitoring progress for each of them, is contained in the Annex. These targets are designed to meet the need for precise definition that would enable implementation. The targets are measurable at national level to enable comparisons to be made between countries and allow aggregation at a global scale. The aim is for target percentage values for each target to be set at the national level as discussed in section 3 and the global percentage values given above would be determined based on averages aggregated from those nationally set targets and associated elements.

These proposed targets are relevant to all countries. They build on existing commitments and experience to address challenges that globally are considered most critical to progress.

The suggested global goal for water builds on and extends existing commitments. A global goal for water is fundamental to all other development goals and the proposed framework works for all countries. The targets for the goal for water have important explicit and implicit inter-linkages, making them mutually supportive. For example, access to drinking water and ensuring it is fairly shared requires good governance, balancing competing demands, and the protection of natural supply systems from pollution and water-related disasters. Furthermore, the goal for water and its targets is of direct importance to addressing other proposed areas within the post-2015 framework, such as health, energy, food, employment, gender equality and environmental sustainability.

As water is crucial to all dimensions of sustainable development, it should be feasible to demonstrate strong links between water and other goals and their related targets. Integrating the different development goals into a coherent structure offers the best hope of delivering maximum sustainable benefits for the greatest number of people.

Building the global consensus for Water

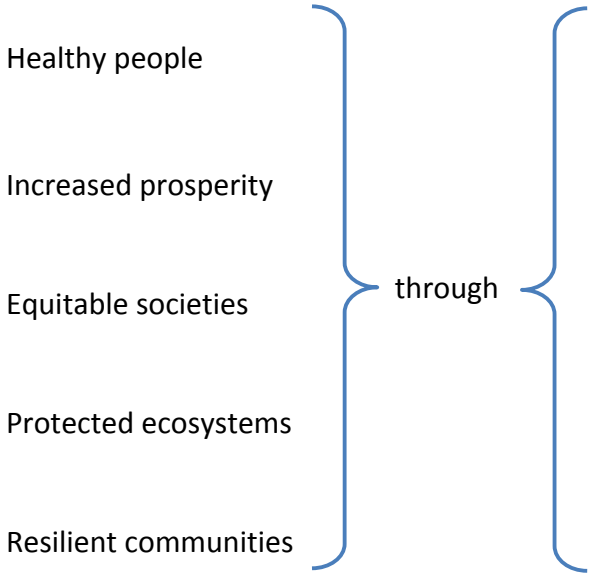
It is increasingly obvious that the current use, development and management of the planet's finite water resources, and the services they provide, is unsustainable. At the United Nations Conference on Sustainable Development in 2012 (Rio+20), governments recognized that water is "*at the core of sustainable development as it is closely linked to a number of key global challenges*". Achieving the development objectives of ending poverty, overcoming inequalities, realizing human rights for all and boosting and sustaining economic development is reliant upon healthy freshwater systems.

The proposed global goal for water addresses the priorities agreed at Rio+20 and in other intergovernmental processes. It draws on lessons learnt from the MDGs, the unfinished business of implementing the MDG agenda, and on outputs from global, national and regional stakeholder consultations. The goal also reflects the reports of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda, the UN Sustainable Development Solutions Network, the UN Global Compact, the UN Development Group, the Progress Report of the Co-Chair of the intergovernmental Open Working Group on SDGs (OWG), and the Budapest Water Summit, among others.

Towards the future we want

This paper's aim is to inform ongoing discussions on the post-2015 agenda. UN-Water Members and Partners recommend that the many interrelated water issues need to be addressed coherently through a dedicated water goal in order to achieve the future we want.

The suggested water goal and targets recognise the development aims of societies whilst ensuring achievements are sustainable over the long term. The goals would promote the following development outcomes, among others:



- Universal access to safe drinking water, sanitation and hygiene, improving water quality and raising service standards
- The sustainable use and development of water resources, increasing and sharing the available benefits
- Robust and effective water governance with more effective institutions and administrative systems
- Improved water quality and wastewater management taking account of environmental limits
- Reduced risk of water-related disasters to protect vulnerable groups and minimize economic losses

The post-2015 aspirations for poverty eradication in the context of sustainable development will fail unless the proposed approach to the management of water and the provision of water-related services is adopted in all countries. It is important, too, for water to be linked to the other goals and targets selected by UN member states.

The paper demonstrates the magnitude and urgency of the task that needs to be accomplished at the global scale. The size of the population without access to clean and safe water and sanitation is measured in billions of people. The demands for freshwater to meet growing human needs, the imperative for wastewater treatment to preserve and protect water quality and action to arrest the impact of nutrient pollution imply a major step change from Business As Usual. The new development agenda can stimulate the urgent action that is needed to correct current trends.

1 A dedicated global goal for water

Water is at the core of sustainable development and is critical for socio-economic development, healthy ecosystems and for human survival itself. It is vital for reducing the global burden of disease and improving the health, welfare and productivity of populations. It is central to the production and preservation of a host of benefits and services for people. Water is also at the heart of adaptation to climate change, serving as the crucial link between the climate system, human society and the environment. Without proper water governance, there is likely to be increased competition for water between sectors and an escalation of water crises of various kinds, triggering emergencies in a range of water-dependent sectors.

The physical world of water is closely bound up with the socio-political world, with water often a key factor in managing risks such as famine, migration, epidemics, inequalities and political instability. A unifying global regime is thus needed to take on the myriad of challenges involved in making social progress.

Water supply for domestic purposes, sanitation, agriculture, industry and energy are inter-linked and all generate wastewater and cause pollution. Water resources must be managed sustainably if supplies are to be maintained for people and economic uses. Development Goals for poverty reduction and food security, energy and others cannot be met without reliable water supplies. In some cases this will entail difficult trade-offs between different water users.

The adoption of a specific water goal will avoid fragmented and incoherent solutions that may result in solving one problem but creating another elsewhere. The future development agenda should contain a global goal dedicated to water and "Securing sustainable water for all" is proposed for this purpose.

As the time limit for the Millennium Development Goals (MDGs) draws to a close in 2015, the global community is taking stock of how it can move towards a sustainable future. A global goal for water and associated targets would build on the MDGs and redouble efforts to develop water supplies and sanitation services for human needs. It would ensure water – as a resource – remains of high quality and is managed equitably and efficiently. It would also make societies resilient to extreme events and climate change. Not least, a dedicated global goal for water would positively shape human development in the coming decades by supporting other efforts aimed at reducing extreme poverty by 2030.

Continuing population growth and urbanization, rapid industrialization, and the expansion and intensification of food production are all putting pressure on water resources and increasing the discharge of polluted water within and beyond national borders. This is occurring at a time when millions of people still lack access to even the most basic drinking water and billons lack

basic sanitation[1]. Access to water supply and sanitation is very unequal, whether this is measured between urban and rural areas, between slums and formal urban settlements, between men and women, or between disadvantaged groups and the general population. Likewise, populations differ greatly in their vulnerability to water-related disasters. A goal for water would need to address those inequalities that threaten human health and wellbeing, whilst protecting the freshwater ecosystems on which everyone depends[2.]

In many basins, the wasteful use of water and its pollution are already imposing immense costs and damage that amount to serious environmental degradation and which compromise the benefits of water services, particularly to the poor and vulnerable. Over 1.7 billion people are currently living in river basins where water use exceeds recharge, leading to the desiccation of rivers, depletion of groundwater and the degradation of ecosystems and the services they provide[3]. The fact that, on some estimates, over 80% of wastewater is discharged without treatment[4] makes this situation worse. Protecting water quality from all sources of wastewater pollution, domestic, industrial or agricultural, is a prerequisite for sustainable development, human well-being and ecosystem health - as was clearly expressed at Rio+20.

As countries develop and populations grow, the potential demand for water is projected to increase by 55% by 2050[5]. Already by 2025, two thirds of the world's population could be living in water-stressed countries if current consumption patterns continue[6]. Approximately 40% of the world's population lives in basins that comprise two or more countries, which account for about 60% of global freshwater flow with about 2 billion people worldwide dependent on groundwater.[7] Water supply crises have been identified by industry, government, academia and civil society as one of the top three global risks[8]. Adopting a water goal would send a clear message that policymakers should focus on this impending threat.

Current global trends, including socioeconomic and climatic changes, will aggravate disaster risks, outstripping the adaptation capacities that societies have evolved over time. Natural hazards destroy lives and livelihoods, and have long-term consequences for human and economic development. The negative impacts of disasters may further exacerbate inequalities and are disproportionately borne by poor and vulnerable communities. Developing robust solutions to manage these escalating disaster risks due to rapid global changes will call for new strategies and a stronger capacity to absorb expected changes.

[1] WHO/UNICEF (2012) Joint Monitoring Programme for water supply and sanitation, progress on drinking water and sanitation 2012 update, USA,
[2] UNEP and UN-Habitat (2010): Sick Water: The Central Role of Wastewater Management in Sustainable Development, UNEP and UN-Habitat, Nairobi.
[3] High Level Forum (2013): http://www.unwater.org/downloads/High-Level-Forum-Outcome-Statement-22Mar2013.pdf
[4] Sick Water
[5] OECD (2012): *Environmental Outlook to 2050*. OECD, Paris.
[6] UNESCO (2009): UN World Water Development Report, UNESCO, Paris.
[7] UN-Water (2008): *Sharing benefits, sharing responsibilities*
[8] World Economic Forum (2013): *Global Risks 2013: Eighth Edition*, World Economic Forum, Davos.

The recent IPCC findings point to changes in the water cycle and in climatic variability[9]. Whilst the changes will not be uniform, the contrast in precipitation between wet and dry regions and wet and dry seasons is likely to increase. Climate scientists lead us to expect global-scale changes in precipitation patterns, although with considerable regional variation. More intense precipitation in wet tropical regions is likely to increase flood risk and large floods will probably surpass historical events in size and/or frequency in some regions. Many mid-latitude arid and semi-arid regions are likely to receive less precipitation, with the likelihood of having droughts larger and longer than those observed since 1900.

Water-related disasters are the most economically and socially destructive of all natural disasters. Since the original Rio Earth Summit in 1992 floods, droughts and storms have affected 4.2 billion people (95% of all people affected by disasters) and caused USD 1.3 trillion of damage (63% of all damage)[10]. Implementing the proposed water goal would help to alleviate this growing problem.

Freshwater (both surface water and groundwater) is central to the three dimensions of sustainable development – social, economic and environmental. Securing sustainable water for all yields important returns in terms of people's health, food security, industrial production as well as the health of ecosystems and the services they provide. As one example of this, the economic loss from the inadequate delivery of water and sanitation was estimated to amount to 1.5 % of gross domestic product of the countries included in a WHO study on meeting the MDGs[11].

Growing scarcity of water, in both absolute and economic terms, imposes high costs on the poorest and most vulnerable people, – with direct implications for the fundamental aim of ending poverty. A dedicated global goal for water provides an opportunity to address this situation. A global goal for water would thus contribute to poverty eradication, gender equality, enjoyment of the human right to water and sanitation, and universal human development while conserving the Earth's finite and vulnerable water resources for current and future generations.

This document presents the essential foundations for a global goal for water. Chapter 2 shows how the proposed water goal has evolved from the gathering international consensus, expressed in a series of landmark commitments. It is followed by the presentation of the proposed target framework, in chapter 3. Chapter 4 discusses the costs and benefits likely to be associated with the targets and Chapter 5 the required means of implementation. Finally, Chapter 6 presents some concluding remarks. The Annex gives a more detailed summary of the proposed targets, indicators and development outcomes.

[9] IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[10] UNISDR (2012) Impacts of Disasters since the 1992 Rio de Janeiro Earth Summit, http://www.preventionweb.net/files/27162_infographic.pdf

[11] WHO (2012): *Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage,* WHO/HSE/WSH/12.01, Geneva.

2 A water goal building on existing commitments

Setting a future development agenda and Sustainable Development Goals will entail tough choices in order to ensure a world free from poverty that can sustain future generations. Water is a key entry point that allows for tangible, practical and achievable solutions to major development issues. We are not starting with a clean sheet - countries have already made numerous commitments on water and sanitation, highlighted below.

2.1 The United Nations Conference on Sustainable Development (Rio+20)

The Rio+20 conference in 2012 was an opportunity to reflect on progress towards sustainable development over the previous 20 years. One of its main outcomes was agreement to launch a process to develop a set of Sustainable Development Goals, which build on the Millennium Development Goals and converge with the post-2015 development agenda. The Rio+20 outcome document "The Future We Want" [12] explicitly recognized "*that water is at the core of sustainable development*". Furthermore, while reconfirming previous commitments made at the Millennium Assembly in 2000 and World Summit on Sustainable Development in 2002, at Rio+20 member states committed to[13]:

- the progressive realization of access to safe and affordable drinking-water and sanitation for all;
- significant improvement in the implementation of integrated water resources management at all levels as appropriate;
- protection and sustainable management of ecosystems, recognizing their key role in maintaining water quantity and quality;
- addressing water-related disasters, such as floods and droughts, as well as water scarcity;
- significant reduction of water pollution, increase water quality and significant improvement in wastewater treatment and reuse;
- improvement in water efficiency and reduction of water losses.

These commitments and earlier ones outlined below form the basis for the proposed global goal and targets for water.

2.2 Global commitments on water

The Millennium Development Goals (MDGs), agreed in 2000, aimed to halve the proportion of people without sustainable access to safe drinking water and basic sanitation between 1990 and 2015. A total of 768 million people still do not have access to even an improved drinking

[12] A/RES/66/288. The Future We Want – Outcome Document of the Rio+20 Conference.

[13] The many linkages between water and other priority areas are also reflected in the Rio+20 outcome document, where references to water are included in, but not limited to, sections on: food security and nutrition and sustainable agriculture; sustainable cities and human settlements; health and population; biodiversity; desertification, land degradation and drought.

water source and existing indicators do not address the safety and reliability of water supplies[14]. To reach the requirements of the right to access to safe drinking water requires real improvements for several billions of people[15]. The MDG target for sanitation is an even more pressing challenge, with 2.5 billion people currently lacking access to improved sanitation and over one billion still practicing open defecation. At current rates of progress, the sanitation target will be missed by over half a billion people. Furthermore, these global aggregates mask large disparities between nations and regions, rich and poor, between rural and urban populations, as well as between disadvantaged groups and the general population. There is currently no global target to improve hygiene, despite this being one of the single most cost-effective public health interventions.

The human right to safe drinking water and sanitation is explicitly recognized in a number of international conventions and treaties,[16] articulated in CESCR General Comment No. 15 of 2002 and affirmed by resolutions of the UN General Assembly and the UN Human Rights Council in 2010. The right obliges States to provide for its progressive realization[17] and entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for essential personal and domestic uses[18]. Building on the progress of the existing MDGs for water supply and sanitation will address "unfinished business" and should be a top priority.

A succession of high-level political declarations and intergovernmental agreements over the last 20 years highlight the ambition of UN Member States to improve the development and use of their water resources. These include the Earth Summit, Agenda 21, 1992, the MDG target 7A and 7C and articles 25 and 26 of the Johannesburg Plan of Implementation, 2002. In the latter, countries committed to improving the integrated management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

Countries committed to the Framework Convention on Climate Change which came into force in 1994 with the ultimate aim of preventing 'dangerous' human interference with the climate system. As water is such a key element of the climate system, the Convention aims cannot be met without simultaneous action to manage water resources and tackle water-related disasters.

In a recent UN survey for the Rio+20 conference more than 130 countries confirmed the widespread adoption of integrated approaches to water management, but warned that significant challenges remain[19]. Unless attention is paid to the sustainable use and development

[14] Progress on Sanitation and Drinking Water - 2013 Update. WHO/UNICEF Joint Monitoring Programme

[15] Bartram, J. , Onda, K. and LoBuglio, J. -2012. Global access to safe water: Accounting for water quality and the resulting impact on MDG progress. International Journal of Environmental Research and Public Health. pp. 880-894

[16] Convention on the Elimination of Discrimination against Women (1979), the Convention on the Rights of the Child (1989), the Convention on the Rights of Persons with Disabilities (2006).

[17] The principle of 'progressive realization' acknowledges that some rights may be difficult in practice to achieve in a short period of time, and that states may be subject to resource constraints, but requires them to act as best they can within their means, to the maximum of their available resources, and including through the adoption of legislative measures.

[18] See *The Right to Water* OHCHR Fact Sheet No. 35.

[19] UNEP (2012): *The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management,* UNEP, Nairobi.

of water resources and the ecosystems that provide them, the difficulty of balancing water supply between multiple users and uses will become worse[20].

The 10th Conference of the Parties of the Convention on Biological Biodiversity in 2010 endorsed the Aichi Biodiversity Targets including Target 14: "By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities and the poor and vulnerable."

In stark contrast to the "unfinished business" of access to safe drinking water and the sustainable use and development of water resources, water quality has so far been a neglected topic in global debates. Symptomatic of this neglect is the fact that approximately 80% of wastewater is discharged to the natural environment without any form of treatment[21] [22]. Pollution resulting from diffuse agricultural and other land use activities has a very serious, but largely un-quantified, damaging impact on the quality of both freshwater and marine water bodies. This pollution imposes heavy costs on downstream users and ecosystems. As water quality continues to decline its impact on increasingly limited water supplies is becoming an issue of serious concern[23], which was very clearly expressed at Rio+20. The post-2015 development agenda provides an opportunity to address this important gap.

Water-related disasters, including both natural hazards such as floods and droughts, and also human-influenced disasters such as chemical spills or dam failures, appear to be ever more frequent. Rio+20 called for stronger coordination between disaster risk reduction and development planning, and suggested mainstreaming climate change adaptation and resilience-building into broader strategies for sustainable development. The UN Special Thematic Session on Water and Disasters in March 2013 highlighted the particular linkages between water and disasters. 2015 could be auspicious in marking the transition to the second phase of the Hyogo Framework for Action, making this an opportune time to harmonize the management of water and disasters at the highest level.

2.3 Emerging priorities from global and national consultations in 2013

Since Rio+20 there has been a wide range of follow-up consultations aimed at identifying water-related priorities articulated by all parties. These include, but are not limited to, the Global Thematic Consultation on Water (The World We Want 2015)[24] with perspectives from people in 185 Member States responding to weekly topics of widespread concern, the African Ministers' Council on Water regional consultations held in Monrovia and Tunis in early 2013[25], and a series of 22 national stakeholder consultations facilitated by the Global Water Partnership bringing together over 1,000 representatives of government, private sector,

[20] UNEP (2005): *The Millennium Ecosystem Assessment*, UNEP, Nairobi .
[21] UN-Water Task Force on Wastewater Management (2013): *Wastewater Management and Water Quality: Input Paper for UN-Water SDG Working Group*, Internal working document.
[22] UNEP and UN-Habitat (2010): *Sick Water: The Central Role of Wastewater Management in Sustainable Development*, UNEP and UN-Habitat, Nairobi.
[23] OECD (2012): *Environmental Outlook 2050: The Consequences of Inaction*, OECD, Paris.
[24] http://www.unwater.org/worldwewant.html .
[25] http://www.amcow-online.org/index.php?option=com_content&view=article&id=302&Itemid=164&lang=en.

academia and civil society, both from within and outside the water community[26]. In addition, a UN sponsored 'My World' voting process with over 1.3 million votes put water as a real priority – ranked 5th out of 17 issues[27].

Expert reports, specifically those from the UN Secretary General's High Level Panel on the post-2015 development agenda, and the UN Global Compact, advocate a dedicated goal and targets on water in their post-2015 proposals[28]. This was echoed in the progress report of the OWG's first four sessions[29], showing broad support for a global goal for water as the best approach for tackling its complexity and inter-relatedness. The subsequent Budapest Water Summit in October 2013 brought together approximately 1200 participants representing governments, international organizations, donors and member states, philanthropists, civil society, academia and the private sector. A statement "A Sustainable World is a Water Secure World" was adopted, which calls for the development of a dedicated and comprehensive SDG on water[30].

A number of priorities have emerged from these extensive consultations with stakeholders, including achieving a balance between the competing uses and users of water for various purposes, meeting basic human needs, meeting productive needs, and maintaining ecosystems. These are all integral to a water goal and targets because of the interdependency between the natural, social and economic values of water. Strengthening institutions and improving water governance are viewed as critically important to achieving the goal and targets, and to manage their attendant risks and achieve the desired development outcomes.

Other key messages from stakeholders are that good water governance enables people to participate in decisions affecting their lives. To ensure this, accountability mechanisms need to be in place. There is a broad stakeholder consensus that the water challenge goes well beyond access to drinking water and sanitation services for all, to envelop water resources, wastewater management and related issues of water quality, as well as addressing both man-made and natural catastrophic events.

[26] http://www.gwp.org/gwp-in-action/News-and-Activities/Country-Consultations-on-Water-Speak-to-post-2015-Agenda/
[27] http://www.myworld2015.org/
28 http://www.post2015hlp.org/; http://www.unglobalcompact.org/ .
29 http://sustainabledevelopment.un.org/content/documents/1927interimreport.pdf.
30http://www.budapestwatersummit.hu/data/images/Budapest_Water_Summit_Statement___Final___11_October_2013.pdf.

3 A proposed framework for a global goal for water

The above-mentioned processes and reports reflect an emerging consensus for a post-2015 development framework for water comprising an aspirational global goal for water supported by time-bound targets with associated elements and indicators to permit measurement and reporting of progress. The elements that support the target aim to communicate more fully the scope of the target. As far as possible, any universal targets should be formulated to make them quantifiable.

The MDG framework did not address the full water and development agenda, nor fully recognize its synergies with other areas and concerns. Emphasis on 'Sustainability' was not included and human rights and inequalities were also largely ignored in the MDG framework. Subsequently, member States have agreed that human rights, equality and sustainability should form the core of the development agenda and be recognized as critical for true development. A comprehensive water goal is thus proposed, reflecting the fundamental importance of water to both people and the environment, now and in the future. The goal addresses all dimensions of the water cycle connecting access, use, development, pollution and risks associated with water. The goal is relevant and applicable to both developed and developing countries.

The proposed overarching goal could be stated as **"Securing Sustainable Water for All".** It is supported by a coherent and inter-dependent set of targets that together would meet this global goal. To clarify the multiple functions of water in society, the framework comprises five manageable and interconnected targets. The short versions of these targets are:

A. Achieve universal access to safe drinking water, sanitation and hygiene
B. Improve by (x%) the sustainable use and development of water resources in all countries
C. All countries strengthen equitable, participatory and accountable water governance
D. Reduce untreated wastewater by X%, nutrient pollution by Y% and increase wastewater reuse by Z%
E. Reduce mortality by (x%) and economic loss by (y%) from natural and human-induced water-related disasters

These short versions are provided for ease of communication. A long version that provides more detailed text and the complete and operative wording of these targets, together with indicators for monitoring progress for each of them, is contained in the Annex. These long targets are designed to meet the need for precise definition that would enable implementation. The targets are measurable at national level to enable comparisons to be made between countries and allow aggregation at a global scale.

The five targets are intended to drive progress at global level. Each of them is built up from a number of elements that can be defined by each country. The framework can be tailored to different national, institutional and policy contexts so it is both universal and responsive to

national circumstances as discussed at the 3rd session of the OWG. The close interdependence between water and many other development themes such as food, land, energy, health, biodiversity and climate change also calls for an adaptable framework that permits these connections.

A rich set of well-defined supporting indicators is proposed to measure progress on meeting the proposed targets. A selection of these is provided in the Annex of this paper. The choice of indicators will depend on the formulation of the final target and the overall framework of development goals. Individual countries have the opportunity to take their specific conditions into consideration. The disaggregation of data on the status of particular target groups will be necessary for all indicators in order to assist the aim of reducing inequalities.

A coherent policy environment is essential to achieve the aims of the post-2015 development agenda. Meeting the goal requires concurrent actions to achieve all targets in each target.

3.1 Safe drinking water, sanitation and hygiene

The proposed full target for Safe drinking water, sanitation and hygiene (WASH) is: "By 2030: to eliminate open defecation; to achieve universal access to basic drinking water, sanitation and hygiene for households, schools and health facilities; to halve the proportion of the population without access at home to safely managed drinking water and sanitation services; and to progressively eliminate inequalities in access"[31]. The target focuses on the progressive realization of the right to water and sanitation through increasing the number of people with access, improving existing service levels and progressively eliminating inequalities in access to services reflecting the established principles of the human right to water and sanitation, as recognized in Resolution 64/292 of the UN General Assembly in July 2010. The aim of the target is to encourage Governments to adopt ambitious targets for improving WASH service levels in order to reduce the global burden of WASH-related diseases, to improve productivity and economic growth, and to reduce inequalities between population groups

Achieving the target will require actions covering the following elements:

- No Open Defecation: to eliminate open defecation
- Basic Access: to achieve universal access to basic drinking water, sanitation and hygiene for households, schools and health facilities
- Safely Managed Services: to halve the proportion of population without access at home to safely managed drinking water and sanitation services
- To progressively eliminate inequalities in access

The proposed target, its elements and indicators are aligned with the recommendations of international expert consultations facilitated by the WHO/UNICEF Joint Monitoring Programme

[31] Detailed illustrative target: By 2030: To eliminate open defecation; to achieve universal access to basic drinking water, sanitation and hygiene for households, schools and health facilities; to halve the proportion of the population without access at home to safely managed drinking water and sanitation services; and to progressively eliminate inequalities in access

(JMP) during 2011 and 2012[32]. The target builds on the existing MDG Target 7C and addresses many of its shortcomings. Specifically, the scope of the new target is expanded beyond water and sanitation to include hygiene, and beyond the household to cover non-domestic settings. It also addresses priority concerns relating to safety, equality and sustainability. The suggested new target addresses open defecation and aims at a higher level of service compared to the MDGs.

For sanitation, the first priority is to eliminate open defecation which has profound harmful health and environmental impacts for the world's poorest communities. The next step is to strive to achieve universal access to basic drinking water, sanitation and hygiene for every household, school and health facility. There is growing consensus that universal access is within reach for the post-2015 period but that it is nevertheless an ambitious target. This is particularly true for sanitation coverage which lags well behind that of drinking water, and hygiene, which is not currently monitored. On the other hand, universal access to basic drinking water, sanitation and hygiene is an obligation of States pursuant to the human right to water and sanitation, is essential for eliminating extreme poverty and necessary to achieve related 'zero' targets in health, education and nutrition.

During consultations a wide range of non-domestic settings were considered for inclusion but schools and health facilities were consistently identified as the top priorities. Having achieved universal access to basic services the next step would be for countries to progressively increase the number of people whose services are safely managed. The final essential element would then be to progressively eliminate inequalities in access to services by disaggregating population groups (e.g. rich/poor; urban/rural; slums/formal settlements) and monitoring the difference in the rate of change between disadvantaged groups and the general population.

Detailed definitions and indicators have been developed to support effective monitoring of future WASH targets. These specify the maximum time that should be spent collecting water, the minimum quality of water provided, and the safe management of the services. The sanitation definition specifies which types of sanitation are acceptable, how many people could share a sanitation facility and arrangements for disposal of excreta. The hygiene definition specifies standards for hand washing and menstrual hygiene management facilities.

Minimum levels of service in schools and health centers are based on existing WHO standards. Based on feedback from ongoing consultations the existing list of definitions and indicators is being further refined and where necessary new ones added. The JMP working groups recommend building on and enhancing existing monitoring systems which are primarily based on household survey data and exploring how these might be combined with new emerging sources of regulatory data in the future. The formulation of the targets, indicators and definitions in this section are aligned with concerns revisited in Target C Water Governance.

3.2 Water Resources

[32] http://www.wssinfo.org/post-2015-monitoring/overview/

The target "Improve by (x%) the sustainable use and development of water resources in all countries" aims to promote decisions and actions that take into account both human and environmental water requirements, as well as the need to increase the long-term viability of natural supply systems. Given the diversity in levels of development between countries, this target enables each country to set its own desired progress according to its specific circumstances, responding to the call for the post-2015 development agenda to be adapted to national contexts.

Achieving the target will require actions covering the following three elements:
1) Bringing freshwater withdrawals into line with sustainably available water resources;
2) Restoring and maintaining ecosystems to provide water-related services;
3) Increasing water productivity for all uses.

As global water withdrawals continue to rise by approximately 10% every 10 years[33] (expected to be much higher in developing regions), it is becoming increasingly critical to bring water withdrawals into line with limited renewable levels of ground and surface water. Complementary measures would be required to balance demands from different users and uses, and to increase the amount of freshwater available for use by increasing storage capacity. Options for the latter range from natural water stores, such as groundwater aquifers, soil water and natural wetlands, to small artificial ponds, tanks and reservoirs behind major dams.

The overall improvement in human well-being in recent years has come with growing problems of habitat fragmentation and loss, biodiversity loss, increases in certain human health risks, and growing levels of water pollution[34]. The Millennium Ecosystems Assessment stressed that the capacity of freshwater ecosystems to provide clean and reliable sources of water is in a state of accelerating decline in many parts of the world[35]. The urgent need to restore and maintain ecosystems to provide water-related services on which we depend cannot be overstated.

Global water withdrawals of approximately 4,000 km3 annually are shared between agricultural (70%), domestic (10%) and industrial (20%) uses[36]. Although it is widely known that water is a limited resource, water that is withdrawn often goes to waste through a combination of poor agricultural practices, leakages from supply infrastructure, domestic misuse and inefficient industrial processes. Changes in practices aimed at reducing waste and increasing water productivity are not only essential to secure sustained social and economic development, but can also lead to huge cost savings as cited in chapter 4.

As shown in the Annex, the target and its three related elements are combined with a set of indicators to promote more sustainable use and development of water resources. The indicators build on MDG indicator 7.5, the 'Proportion of total water resources used' and

[33] UNEP (2008), Vital Water Graphics: An Overview of the State of the World's Fresh and Marine Water Resources, 2nd Edition, UNEP, Nairobi
[34] Ibid.
[35] The Millennium Ecosystem Assessment, 2005, (a synthesis by over 1000 leading biological scientists). http://www.maweb.org/en/index.aspx
[36] World Bank, Data: http://data.worldbank.org/indicator/ER.H2O.FWIN.ZS/countries/1W?display=graph

extend this to determine if water is being managed in a sustainable way, balancing the social, economic and environmental demands with resource availability. The target is intended to stimulate responsible water resources development both in countries with adequate supplies and those with scarce resources. Given the central role of hydrological basins (surface and groundwater) in the management of water resources, countries will need to establish mechanisms that are effective at basin level, including those that cover more than one country or state.

3.3 Water Governance

The target, "all countries strengthen equitable, participatory and accountable water governance", aims to promote an enabling environment such that institutional structures relevant to water are effective and that its administrative systems function for the benefit of society as a whole. It underpins all the water targets and supports linkages to other development themes.

Achieving the target will require actions covering the following four elements:

- Implementing integrated approaches to water management at local, basin and national levels including participatory decision-making;
- Delivering all drinking water supply, sanitation and hygiene services in a progressively affordable, accountable, and financially and environmentally sustainable manner;
- Ensuring regulatory frameworks are in place for water resources, infrastructure and services, and enhance the performance of responsible public authorities and their water operators
- Strengthening knowledge transfer and skills development.

Water governance has been defined as "*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*"[37]. Its importance for the new development framework has been stressed by many international organizations, including the UN, OECD and World Bank.

The enabling environment, including effective institutions and management instruments, eases the formulation and implementation of relevant policies and plans. It responds directly to the Rio+20 outcome, which called for significant improvement in the implementation of integrated water resources management at all appropriate levels. Only through an integrated approach can the allocation of water resources benefit the many and not the few. Water governance is essential to balance available resources with demands from a multitude of often conflicting water users as well as ensuring critical eco-systems continue to maintain the resource base.

Participatory mechanisms and accountability will help to address disparities in service provision and help policy makers to focus on inequity and its deeper causes. A universal approach is

[37] Rogers P and A W Hall, 2003, Effective Water Governance, TEC Background Paper 7, GWP, Stockholm

proposed that tackles both inequalities and sustainability (ensuring intergenerational equity), and respects the human right to water and sanitation services.

Appropriate governance measures, such as regulation and enforcement of agreed standards, are essential to ensure overall quality of water bodies over time. Controlling pollution will improve water quality in rivers and lakes as well as support ecosystem functioning by reducing organic and mineral nutrients that deplete the oxygen supply.

Strengthening water governance will require a concerted programme of education, knowledge and skills development, including a focus on youth and women. The collection, analysis, and use of sex-disaggregated data, gender statistics and other social data are necessary to check that meeting the targets removes inequalities.

Given the natural diversity in governance systems and levels of development between countries this target enables each country to set its own sub-targets according to its specific circumstances.

The governance indicators would cover aspects relevant to all countries acknowledging different contexts, and extend across all the targets. Measuring progress on governance will require an essentially qualitative analysis of a wide range of measures. This would be done using social science survey methods, such as structured questionnaires and house hold surveys, following up and improving on the survey on water resources submitted to the Rio+20 conference. The indicators would be an integral part of the survey covering the four elements that make up target C, given in the Annex. For example, the indicators would measure progress on strengthening governance issues in relevant institutions, assessing the ability to formulate and implement policies, laws and strategies, and improvements in relation to gender and disadvantaged groups to determine if progress is benefitting all social groups. The indicators would also measure progress on putting in place effective institutions and agreements for national and international basin management.

3.4 Managing wastewater and pollution to protect water quality

In addition to adequate volumes of water, social and economic development is also dependent on good water quality. Human activity is the main cause of pollution that makes water dangerous, expensive or even unusable. This part of the proposals concentrates on the need to limit pollution, manage wastewater and protect and improve the quality of water thus enabling needs to be met safely.

The proposed target reflects the growing urgency for effective wastewater management and prevention of water-related pollution. Managing the human and environmental impacts of poor wastewater management and increasing the re-use of wastewater for productive purposes has significant public health, environmental and economic benefits. The Rio+20 outcome document stressed the need to adopt measures to '*significantly reduce water pollution and increase water quality, (and) significantly improve wastewater treatment*'. The health and poverty reduction

benefits are linked to, and significantly enhance and reinforce, those from targets A and B, particularly regarding water quality and reducing waterborne and water-washed diseases.

While sanitation, wastewater management and water pollution are often closely linked, the structuring of this target into three interrelated components highlights the importance of taking a holistic and comprehensive approach to wastewater.

To date, these aspects of water management have received less attention than they need, consequently in many places the action will start from a very low base. For this reason, the level of ambition has been limited and should be considered a minimum starting point. Many countries will be in a position to take a more ambitious approach.

The full wording of the target is: Reduce wastewater pollution and improve water quality by reducing untreated domestic and industrial wastewater by (x%); increasing wastewater reused safely by (y%); and reducing nutrient pollution by (z%) to maximize water resource availability and improve water quality.

Achieving the target will require actions covering the following three elements:

- Element 1: Reducing untreated domestic and industrial wastewater (including point source agricultural) by (X%);
- Element 2: Increasing wastewater reused safely by (Z%);
- Element 3: Reducing nutrient pollution by (Y%)

The first element of the target, wastewater treatment, seeks to stimulate the management of the wastewater component of the water cycle to ensure that wastewater and the pollutants in it are contained and collected safely and are then treated, so that when the used water is discharged it does not contaminate its receiving water body. The target has two components that correspond to the most prevalent situations. The first is municipal wastewater, which is usually a mixture of domestic and industrial wastewater. The second is the wastewater created by identifiable and contained sites in industry and agriculture and usually referred to as “point sources”.

The second element is to ensure that used water can be used for other purposes and is recognized as being a valuable water resource.

The third element of the target, reducing nutrient pollution, ensures that the overall quality of water bodies improves over time as a result of effective wastewater management, including from “diffuse or non-point” agricultural, industrial and domestic sources. Additional and important health benefits also result from positive impacts on the environment. These include improved water quality in rivers and lakes since decreased eutrophication of freshwater and coastal areas improves ecosystem functioning in these areas and, by extension, provides improvements in ecosystem services that support beneficial social and economic activities.

There is growing recognition that the management of domestic wastewater - especially in the urban setting - is crucial to realize the health and environmental gains possible through providing basic sanitation facilities. Protection of water quality from all sources of untreated

wastewater, be they domestic, industrial or agricultural, is a prerequisite for ensuring, sustainable development, poverty alleviation, job creation, human and ecosystem health and people's well-being. This concern and recognition was very clearly expressed at Rio+20 and requires countries to act.

Indicators are proposed that promote improved wastewater management and pollution prevention by addressing: (i) public health protection (ii) protection of the environment (iii) promote the reuse of wastewater and sludge, (iv) support the multiple opportunities of water, nutrient and energy recovery. It is suggested that the indicators are prioritized to address: a) pollution from urban wastewater that comprises both domestic and industrial components, b) point source pollution from large scale industrial and agricultural activities, and c) diffuse pollution, primarily from agriculture. The indicators are designed to help the progressive realization of improvements and to be appropriate to the local context and to the nature of the receiving waters, while avoiding the creation of perverse incentives or objectives that may not be in the national best interest.

As with the other targets, this target both supports and is supported by the other components of the water goal. For example, it aims to ensure water quality by collecting and treating the pollution arising from sanitation and hygiene, but can only do this if the appropriate governance systems are in place.

3.5 Water-related Disasters

Floods, droughts and windstorms are the most frequently occurring natural disaster events and account for almost 90% of the 1,000 most disastrous events since 1990. The number of people affected and estimated damages from water-related disasters continue to increase[38] and are a constant feature of news reports. Governments are obliged to take disaster risk reduction measures to protect, respect and fulfil the human rights guaranteed by international human rights instruments. The Rio+20 outcome document highlights that they also pose huge economic risks with costs estimated at USD 1 trillion from 2000 to 2010. Climate change is anticipated to increase the frequency of heavy precipitation over many areas of the world, and to intensify droughts in some seasons and areas. Water management and development strategies have a pivotal role in reducing the exposure and vulnerability of people and assets to water-related extremes. The proposed target is thus closely linked to the water resources management targets discussed above, in particular the governance target.

The target is formulated as "Reduce mortality by x% and economic loss by y% from water-related disasters". This is accompanied by the following elements at national level:

- Increased knowledge and understanding about communities at risk from water-related disasters, especially those likely to arise from climate change;

[38] Adikari, Y. and Yoshitani, J. (2009) Global Trends in Water-Related Disasters: An Insight for Policymakers. ICHARM, Tokyo

- Adoption of integrated disaster risk management, including an appropriate mix of structural and non-structural approaches, to reduce mortality and economic losses from water-related disasters;
- Adoption and implementation by countries of monitoring and people-centered early warning systems for communities most at risk from water-related disasters; and
- Application of an end-to-end preparedness approach to water-related disaster management which sees the needs of user communities being met, to the last mile.

The proposed target elements focus on actions to build resilience in order to reduce losses of human life and economic damage. The target includes risks from a wide span of water-related disasters, including natural hazards of storms, floods, and drought, as well as anthropogenic hazards such as releases of hazardous materials and other forms of serious water pollution.

The target builds on abundant evidence that planning, preparedness and coordinated responses greatly improve the resilience of communities to natural hazards and should thus form the basis of cost-effective investment strategies to meet the targets. To avoid preventable losses associated with disasters, the focus of communities, governments and development partners should be on shifting resources from disaster response and relief to enhanced preparedness. The proposed targets follow proven disaster risk reduction strategies endorsed by the internationally agreed Hyogo Framework for Action. The keynotes of the proposed approach are community-level participation and preparedness, with facilitation and support from national policies and basin-wide cooperation

Four core indicators are proposed; firstly, mortality due to water-related disasters, broken down by vulnerable groups and by gender; secondly, the estimate of direct economic losses from water-related disasters, as a percentage of GDP; thirdly, the proportion of at-risk communities with effective people-centred early warning systems for water-related disasters; and finally, the percentage of all countries that have assessed their risk of water-related disasters and have set up plans and strategies for integrated disaster risk management, including monitoring systems and preparedness. Links between these elements and a number of the other water targets can readily be drawn. For example, the impact of serious drought on plans to expand drinking water coverage, or the effect of serious flooding on the spread of water contaminants such as raw sewage.

Amongst other things, use of these indicators will require modeling of demographic changes and remote-sensing to determine land-use and estimate exposure to water related hazards. Agreement will need to be reached on a common system for classifying the severity of water-related hazards, such as floods. Indicators for drought risk will need to consider socio-economic as well as environmental factors, and disaggregate the relative weights of these factors. Appropriate baselines (e.g. on a counterfactual level of mortality) will need to be developed[39]. Generating these and other kinds of data will pose statistical challenges in the early years of monitoring progress against the goal.

[39] Guha Sapir, D. and Hoyois, P. (2013) Disaster Deaths. Proposed indicators for monitoring disaster-related mortality. In Mitchell, T., Jones, L., Lovell, E. and Comba, E. (Eds.) Disaster Risk Management in Post-2015 Development Goals. ODI, London.

4 Costs and benefits associated with a global goal for water

The implementation of a global goal for water is expected to generate economic, financial and other benefits that outweigh its costs. These benefits will extend beyond the water domain as it is normally understood. The development of health, agriculture, energy, industry and other social and economic activities depend on the effective management and provision of water and sanitation. UN University, Stockholm Environment Institute and the UN Office of Sustainable Development have in a recent report made an attempt to estimate the costs and benefits of implementing a water-related SDG. These estimates indicate that larger national investments will be required, but that also larger gains will be made, compared to the water targets of the MDGs.[40]

Notwithstanding the legal and moral obligations as a fundamental precondition for a life of human dignity, it is necessary to investigate the size of net benefits from achieving a dedicated water goal. These will be very country-specific, and dependent on national governments taking actions appropriate for their particular situation. That said, this chapter presents empirical evidence of typical costs and benefits at global, regional and national levels drawn from a range of reputable studies in order to illustrate the likely overall impact of meeting the proposed water goal framework.

While the demonstration of net benefits is an important precondition of actions under the post-2015 development agenda, the respective *distribution* of costs and benefits amongst interested parties should also be analyzed. Key parties involved in implementing the new development framework (water users, farmers, businesses, utilities, etc.) need to have economic and financial incentives to comply with official policies. These factors are important to the consideration of implementation in Chapter 5, which follows.

4.1 Drinking water, sanitation and hygiene

Current evidence suggests that even under the most conservative estimates, historical spending on drinking water supply and sanitation has been 'highly cost-effective' on health grounds alone. The most recent estimates based on MDG target 7c suggest that, globally, the benefits of achieving universal access to *sanitation* outweigh the costs by a factor of 5.5 to 1, whereas for universal access to *drinking-water* the ratio is estimated to be 2 to 1[41]. These results relate to universal cover of *existing* standards of service used by the MDGs. The proposed new global water goal has more ambitious standards. In 2012 WHO estimated the capital cost of reaching universal access to drinking water and sanitation in developing countries (based on the levels of service defined for the MDGs) at approximately USD 535 billion. These figures do not include

[40] UNU and UNOSD, 2013, Water for Sustainability: Framing Water within the Post-2015 Development Agenda. United Nations University Institute for Water, Environment and Health, UN Office of Sustainable Development and Stockholm Environment Institute

[41] WHO (2012): *Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage,* WHO, Geneva.

the cost of operation and maintenance, part of which is typically recovered from users through tariffs and charges.

The proposed target for *basic drinking water* calls for an enhanced level of service compared with the MDG definitions. For example household water collection should not require a round-trip of more than 30 minutes. These more robust definitions of basic services will have an impact on cost estimates: some existing facilities would no longer meet the target and more capital-expensive infrastructure would be required to increase access. Including universal access to a basic drinking water service in all schools and health centers will also increase costs, bearing in mind estimates that around 40-50% of schools are currently not served. The aim of increasing the number of people with water on their premises which meets minimum standards for water quality and is safely managed implies partnerships and more sophisticated, utility-based management systems, which will require greater human resource capacity, scientific research and utilization of local knowledge as well as increased infrastructure costs.

WHO cost estimates for universal access to *sanitation* use the existing WHO/UNICEF definition of 'improved'. The definition developed for "basic" sanitation differs slightly as it includes shared sanitation if facilities are shared among no more than five families or 30 persons, whichever is fewer. Including some shared sanitation could increase the number of people who meet the target, implying a reduction in the costs of reaching universal access.

The target element requiring that, by 2030, excreta should be safely managed in at least half the households with basic sanitation will substantially add to the cost estimates developed for reaching universal access using the MDG definitions[42].

Further estimation is also required of other costs associated with achieving the proposed, and more ambitious, targets, including the higher costs of reaching all un-served remote rural communities and increasing the numbers of people served with water on premises, including those served by utilities. Exogenous trends could also have major implications for cost estimates, such as climate related impacts and increases in the urban population, requiring more costly infrastructure, though some of these costs would be offset by efficiency savings through economies of scale and agglomeration, and the scope for increased revenues.

4.2 Use and development of water resources

Water provides economic benefits to a variety of users throughout its cycle, creating added value from both its productive use and measures to protect its quality and the integrity of the aquatic environment. More productive uses of water by industry, agriculture and energy will save costs for those businesses and release more freshwater for other beneficial uses. Withdrawing less from water systems reduces the need to expand infrastructure, and releases more water to support ecosystem services, including fisheries. Measures to mitigate water scarcity and water-related disasters will reduce economic and social losses across all sectors of society and all businesses.

[42] WHO (2012): *Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage,* WHO, Geneva.

Water is environmental capital that provides essential eco-system services with intrinsic value to society, apart from their impact on directly productive activities. The essential eco-system services provided by water can have very high economic values, supporting tourism, fisheries, etc. and increasing the resilience of communities to disasters and other climatic risks.

Projections made by the McKinsey company imply that in many countries and major regions a serious discrepancy is likely to arise between existing accessible water supply and projected 2030 water withdrawals on a "business as usual" basis.[43]. Bringing supply and demand into a better balance through traditional supply measures would require a major increase in current expenditure, even if these measures were feasible and effective. The alternatives are improved water resources management and various kinds of demand management. The potential contribution of water resources management can be understood in relation to estimates of the cost of current overexploitation of groundwater – 1 to 2.1% of GDP in the Middle East and Northern Africa and USD 12 billion in China, based on the scarcity value of water[44]. Saltwater intrusion due to groundwater overdraft in Europe is already affecting 11 European countries and in California the annual costs of excessive salinity of drinking water aquifers was estimated to be 3.41 billion USD[45].

Although water tends to have a higher average productive value in industrial and municipal uses, agriculture is by far the largest abstractor globally, and would feel the impact of water shortages most keenly. Irrigated agriculture in India, which contributes up to 10% of GDP, relies heavily on groundwater resources, but in several Indian states excessive abstraction results in many wells running dry, with severe social and economic impacts including loss of crop production and increased costs of drilling of new deeper wells[46]. The potential efficiency savings from making more productive use of water in irrigated agriculture have been estimated at USD 115 billion annually by 2030 in 2011 prices, globally. The direct total net benefit of providing more efficient water technologies for an estimated 100 million poor farmers worldwide has been put at USD 100-200 billion[47].

Maintaining a threshold level of environmental water flows will generate major social and economic, as well as environmental, returns[48]. Watershed protection initiatives in the USA are estimated to have yielded USD 7.5 to USD 200, for every dollar invested, compared to conventional water treatment costs[49]. The estimated cost of water related environmental degradation in Middle East and North Africa has been estimated to be about USD 9 billion per year, with a mean estimate of 5.7% of GDP[50].

The use of improved water resources management and institutions, rather than traditional supply-side measures, can be effective and cost-beneficial. In Tamil Nadu, India, for example,

[43] McKinsey, (2012) *Charting our water future*
[44] World Bank (2004) *Economic instruments for Groundwater Management,* GW-Mate Briefing Note Series, Note 7
[45] OECD, (2013) *Water security for better lives*
[46] OECD, (2013) *Water security for better lives*
[47] McKinsey, (2011) *Resource Revolution*, McKinsey Global Institute
[48] Rijsberman, Frank (2004) *The Water Challenge*. The Copenhagen Consensus Challenge Paper.
[49] Emerton, L. and Bos, E. (2004) *Value: Counting Ecosystems as Water Infrastructure*, IUCN, Switzerland and UK.
[50] *3rd UN World Water Development Report*

the creation of robust management institutions that would allow a flexible allocation of water between uses could increase the state's production by 20% over 20 years, compared to reliance on fixed allocations[51].

At a more general level, improved management of water resources could help the many countries that are highly vulnerable to rainfall variability. Africa, for example, loses 5% of GDP due to poor coverage of water and sanitation, 2% to power outages, between 5 - 25% to droughts and floods in affected countries, and perhaps a further 5% to the probable future impacts of climate change[52].

Investment in appropriate infrastructure and technology for the effective use of available water has far reaching economic benefits, including employment, for all use sectors - industry, energy, agriculture, municipalities, tourism, recreation, etc. However, in order to protect such benefits, complementary investment is also needed to prevent pollution of water systems from municipal and industrial waste, agriculture and mining.

Much of the infrastructure required to make productive use of water can also serve to mitigate its destructive effects, especially in agriculture-dependent economies. The use of management tools such as early warning systems alongside physical infrastructure also increase the capacity of a community to anticipate and respond to disasters, as well as protecting and restoring ecosystem services. In this context, natural habitats and ecosystems can be crucial parts of disaster prevention and mitigation: the economic value of the Mississippi Delta has been estimated at between USD 330 billion and USD 1.3 trillion (2007 values), due to flood prevention and hurricane protection as well as other water-related services[53].

4.3 Strengthening water governance.

As described in Chapter 3 governance covers a broad range of systems involved in the management of water and the delivery of its many services. The targets and elements singled out for the water goal are the integration of approaches to management including participatory decision-making, delivering water supply and sanitation services in an affordable, accountable and sustainable manner, creating regulatory frameworks, and promoting knowledge transfer and skills development.

Thus stated, improved governance can be viewed as a pre-condition for the successful achievement of the other four water targets. The "costs" of governance are difficult to measure in economic or financial terms, involving as they do changes in policies, laws and regulations, the creation of institutions and structures, etc. Costs can be identified for the production of plans, the creation of new official agencies, hiring new personnel, training of staff, etc. but this would only capture part of the wider "costs" of governance, on the change of behavior of sanitation users, for instance.

[51] David Grey and Claudia Sadoff, (2005) *Water Resources, Growth and Development: A Working Paper for Discussion*, Prepared for the Panel of Finance Ministers, The U.N. Commission on Sustainable Development, 18 April 2005

[52] Africa Regional Position Paper, 5th World Water Forum, Istanbul

[53] Batker, D., de la Torre, I., Costanza, R., Swedeen, P., Day, J., Boumans, R. and Bagstad, K. (2010) *Gaining Ground – Wetlands, Hurricanes and the Economy: The Value of Restoring the Mississippi River Delta.* Earth Economics, Tacoma, Washington DC. http://www.eartheconomics.org/Page12.aspx

Likewise, it is difficult to isolate the benefits of specific governance measures, except through their impact on the other targets considered in this chapter. Nevertheless, two examples are given below of the potential quantitative impact of governance, respectively measures to improve the sustainability of WASH, and the reduction of corruption.

Sustainability remains a challenge for the progress already made in the continued improvement of water and sanitation services. In an EU evaluation report of 23 water supply and sanitation projects in Sub-Saharan Africa it was found that equipment was generally installed as planned, but fewer than half of the projects met the needs of beneficiaries[54]. Improving water governance will help to sustain the flow of these benefits in the long term through measures such as improved regulation, monitoring, collection of service fees, management of procurement processes, the collection and dissemination of information, and improving the capacity of operators to run the equipment installed.

The *Global Corruption Report 2008*[55] outlines the many ways corruption can impact on water, in particular in the supply of services and hydropower. Whilst determining an exact cost is difficult, the report estimates between 10 and 30 percent of finances may be siphoned-off annually through corrupt practices. For example, an additional USD 11.3 bn could be needed each year to achieve the MDGs on water and sanitation services. Improving water governance would make public water budgets go further (by as much as 30% in some countries), reduce the cost of infrastructure or increase the capacity bought for a given outlay, increase revenues from tariffs and lower the cost of access to water services by poor people [56].

4.4 Water quality and wastewater management

There are important public health, environmental and economic benefits arising from improved water quality and wastewater management, including improved resilience to pollution-related disasters and reduced incidence of waterborne and water-washed diseases.

In order to capture the full benefits from sanitation, studies need to include the benefits of toilets and other domestic systems as well as those due to the safe containment, collection and treatment of the wastewater and related sludge. A WSP study for India suggests that the benefits in 2006 from avoiding the costs of inadequate sanitation could be about USD 33 bn, around 3.9% of GDP or USD 29 per capita[57]. The link between better sanitation and public health is also demonstrated in the UNDP Human Development Report 2006 which shows a strong correlation between the fall in infant deaths and rise in sanitation investment in England and Wales in the period 1840 to 1910[58].

[54] European Court of Auditors. 2012. *European Union Development Assistance for Drinking Water Supply and Basic Sanitation in Sub-Saharan* Countries, Special Report No. 13, Luxembourg.
[55] Transparency International, Global Corruption Report 2008: Corruption in the Water Sector, Cambridge University Press, UK.
[56] *World Water Development Report 3,* 2009, p. 55
[57] The Economic Impacts of Inadequate Sanitation in India, the Water and Sanitation Program (WSP),2010
[58] Watkins et al (2006) Human Development Report 2006 UNDP Box 1.1 p29.

A study by the US Conference of Mayors[59] suggests major benefits from public investment in sewerage and water systems and their efficient operation and maintenance. These benefits accrue in terms of jobs created, final output and private sector investment. The report estimates that one dollar of water and sewer infrastructure investment increases private output (Gross Domestic Product) in the long-term by $6.35 and yields a further $2.62 output in other industries. Additional health benefits result from improved water quality in rivers, lakes, estuaries and near-shore waters as well as aquifers. Moreover, the US report finds that an indirect benefit of local government investment in "green water and sewer infrastructure" such as protecting one hectare of wetlands for source water protection yields USD 4,177 annually in avoided water treatment costs, and another USD 10,000 in other eco-service categories (e.g., water supply, climate regulation, recreation, etc.)

Environmental benefits arise from reduced eutrophication of rivers, lakes and coastal areas, leading to enhanced ecosystem functioning of these areas and improvements in the ecosystem services they provide. Economic benefits from improved wastewater management include reduced pre-treatment costs downstream (for drinking water and industrial/energy purposes), protection of commercial fish stocks and aquaculture, improved living conditions and human well-being (especially in urban areas), enhanced tourism and leisure activities, increased water supply for irrigation and drinking water, saving on fertilizers through use of sludge, etc. Some of these amenity benefits will increase property and land values for riparian owners.

Quantifying these benefits is challenging. Few studies provide aggregate estimates of the monetary costs and benefits of investment in improved wastewater management and broader water quality across the economy or even across a sector. Adopting a wastewater target would increase the impetus to identify and quantify such benefits. Studies that have been undertaken have generally focused on local initiatives and cannot be readily aggregated to national or international level. One aggregate-level study quantified the negative impacts of untreated wastewater discharges into the Bogota River, Colombia. This study estimated the total annual value of costs linked to the lack of wastewater treatment at about USD 110 million, including serious economic damages in different sectors[60].

4.5 Resilience to water-related disasters

Economic losses due to natural and human-induced water-related hazards have risen greatly in the last decade. With expectations of climate change and urbanization this trend is set to continue. More people are moving into urban areas in locations already prone to storms, floods and droughts. Since 1980, the risk of economic loss due to floods has increased by over 160% and to tropical cyclones by 265% in OECD countries. In fact, economic loss risk to floods and cyclones in OECD countries is growing faster than GDP per capita.

Much evidence suggests that investment in preparedness is highly cost-effective. As a case in point, the USD 55 million floodway was built to mitigate flood damage on the Red River in Canada. Since its completion in the 1960s, it has saved an estimated USD 28 billion in damages

[59] Krop R, C. Hernick and C. Franz. (2008) Local government investment in municipal water and sewer infrastructure: adding value to the national economy, Cadmus Group Inc., Watertown, MA 02472, USA

[60] OECD (2011) *Benefits of investing in water and sanitation.* OECD Publishing, Paris

over 20 flooding events[61]. The relative costs and benefits of establishing early warning systems depend upon the magnitude and frequency of hazards and vulnerability of exposed communities. Reported cost-benefit ratios of early warning systems range widely, but there are many cases where benefits substantially exceed costs[62]. For instance, cost-benefit assessments of early warning systems for storms, floods, and droughts undertaken throughout Asia indicate potential returns of up to USD 559 for each USD 1 invested[63].

The economic cost of water-related disasters extends well beyond reported immediate losses and can have repercussions on development on a multi-annual to decadal scale. In places subject to recurrent disasters such as the Ganges-Brahmaputra-Meghna delta in Bangladesh, this effect can create repetitive spirals of loss, incomplete recovery, and reduced resilience to subsequent disasters, generating ever-deepening poverty[64].

Water-related disasters are the most economically and socially destructive of all natural hazards. Since the Rio Earth Summit in 1992, floods, droughts and storms have affected 4.2 billion people (95% of all people affected by disasters) and caused USD 1.3 trillion of damage (63% of all damage)[65]. Moreover, recent findings indicate that direct economic losses from disasters have been grossly underreported and are likely to be 50% greater than what is reported in international disaster databases[66]. Analyzing growth and rainfall statistics for most countries in the world leads to the conclusion that a 1% increase in drought area is associated with a 2.8% reduction in economic growth, while a 1% increase in the area impacted by floods correlates with a 1.8% reduction in economic growth in a given year, with additional lagged effects into following years[67]. Anticipating a worsening of these impacts due to expected climate change, the World Bank has estimated the additional annual costs associated with climate change adaptation, in relation to water resources, to be in the order of USD 13-17 billion across all developing countries. This is a combination of hard and soft investments representing 3% of these countries' total GDP[68].

Droughts and floods occur everywhere, but where water is managed properly, their impacts are greatly reduced and only catastrophic in rare and extreme cases. If, on the other hand, droughts and floods are not managed properly their human and economic impacts can be severe. The impacts on income generation, employment and social security can be particularly devastating, aggravating the vulnerability of poor people and thus increasing poverty. It is estimated

[61] Bronskill, J. (2013). "Lack of national disaster mitigation plan prompts 'criticism': federal notes". Macleans

[62] Rogers, D., and Tsirkunov, V. (2011). *Costs and Benefits of Early Warning Systems.* Global Assessment Report on Disaster Risk Reduction. ISDR and World Bank.

[63] Subbiah, A.R., Bildan, L., and Narasimhan, R. (2008) *Background Paper on Assessment of the Economics of Early Warning Systems for Disaster Risk Reduction*. World Bank,

[64] Webster, P.J., & Jian, J. (2011). *Environmental prediction, risk assessment and extreme events: adaptation strategies for the developing world*. Phil. Trans. R. Soc. A: Mathematical, Physical and Engineering Sciences, 369(1956), 4768-4797

[65] UNISDR (2012) *Impacts of Disasters since the 1992 Rio de Janeiro Earth Summit*, http://www.preventionweb.net/files/27162_infographic.pdf

[66] UNISDR (2013). From Shared Risk to Shared Value –The Business Case for Disaster Risk Reduction. Global Assessment Report on Disaster Risk Reduction. Geneva, Switzerland: United Nations Office for Disaster Risk Reduction (UNISDR).

[67] Brown, C., Meeks, R., Ghile, Y., Hunu, K. (2013) '*Is Water Security Necessary? An Empirical Analysis of the Effects of Climate Hazards on National Level Economic Growth*', Philosophical Transactions of the Royal Society (Accepted)

[68] World Bank (2010) *The Cost to Developing Countries of Adapting to Climate Change. New Methods and Estimates*, The Global Report of the Economics of Adaptation to Climate Change Study. Consultation Draft.

that Kenya's floods in 1997-98 cost the equivalent of 11% of GDP, while the cost of its drought between 1998 and 2000 was equivalent to 16% of GDP[69]. The USA Army Corps of Engineers has spent about USD 200 billion on flood management and mitigation since the 1920s. This investment has yielded an estimated USD 700 billion in benefits, and mitigated the impact of floods on the US economy to such an extent that flood damages have remained below 0.5% of GDP since that time[70].

Planning, preparedness and coordinated responses - including floodplain management, early warning systems and increased public awareness of risk - have been shown to greatly improve the resilience of communities to natural hazards. Blending structural and non-structural flood management approaches is particularly cost-effective. It is likely that the targets in this domain could be met with a modest strategic investment in preparedness which will greatly reduce costs for relief and recovery from disasters. Well designed national public employment programs using local resource-based work methods can have a large multiplier effect on vulnerable communities by combining the multiple objectives of employment generation, income support, asset creation and restoring the natural resource base.

[69] DFID, *Managing Water for Growth And Poverty Reduction*, DFID Policy Background Paper

[70] Delli Priscoli, J. And A.T.Wolf. 2009. *Managing and transforming water conflicts.* International Hydrology Series. Cambridge University Press, UK

5 Implementation of the proposed framework

Meeting the proposed global goal for water and its associated targets, as outlined above, will require a major effort by countries to ensure that the specific actions proposed can actually be implemented. Countries accepting the challenge of the new global development framework will need to accelerate their efforts to improve what the Dublin Conference of 1992 referred to as the "enabling environment" in which to plan and implement projects.

The Enabling Environment

Creating the "enabling environment" entails reforming institutions and building capacity of communities and individuals in support of the Goals. This will require enhanced human capacities at all levels. Barriers to investment should be removed to attract finance, including improved governance, competitive bidding and contract negotiation. At the same time, support for research and development needs to be substantially increased so as to drive technological innovation and reduce the cost of efficient technologies. This in turn requires a long-term commitment to collecting the base-line data necessary for research and for monitoring progress.

The abovementioned actions, and others, will rely on training an adequate number of technicians and professional experts to undertake and oversee the work. Water education should not be limited to a specialist group but extend to the general public, starting with children even at primary school level. Making the general public aware of the issues involved is vital in galvanizing support for the global goal for water at all levels of society. Research, data collection and capacity building in the water sector should be seen as an integral part of national development.

Actions such as those stated above are interrelated, and, if developed together, can form a critical mass with many synergies. However, the separate elements making up the enabling environment will evolve through their own processes, following their different timescales. Action in one domain cannot wait on progress in another and it is only realistic to expect that progress towards institutional reform and capacity building will be uneven. The remainder of this chapter focuses on two of the areas with long lead times where immediate action is especially urgent, on the one hand infrastructure development, and, on the other hand, the creation of monitoring, data and reporting systems.

Implications for infrastructure development:

Hitherto, most information on infrastructure needs and costs has been focused on drinking water supply and sanitation[71] to meet the MDGs. However, some countries, particularly in Africa, have yet to develop their sustainably available water resources, a prerequisite for

[71] Doczi, J, Dorr, T., Mason, N. and Scott, A. (2013) The Post-2015 Delivery of Universal and Sustainable Access to Infrastructure Services. Overseas Development Institute, London

productive uses. Without a major increase in investment for infrastructure many countries will struggle to meet the targets. Further study should be pursued into the need for country-specific investment for water resources management and the control of water and wastewater quality. Such investment will need to be sensitive to its environmental impacts and set out to increase national resilience to climate change. More focus must now be put on spending for operation and maintenance necessary for the sustainability of services from both existing and new infrastructure, not forgetting funding of related governance functions. Infrastructure will include water supply systems, irrigation works, hydropower facilities (especially in Africa), flood control, etc. which can be a source of employment and income generation when appropriate local technologies and labor-based approaches are put in place[72]. New technologies will need to be introduced to use water more effectively and existing works upgraded, replaced or decommissioned.

The protection, use and restoration of ecosystem services (including natural infrastructure) has in many cases proven to be an effective and cost-saving alternative to conventional infrastructure as a solution to water resources management and pollution control. Ecosystems can provide services for drinking water supply, water for food production, wastewater treatment, and disaster risk reduction.

Infrastructure provided for the productive uses of water can also provide security against the destructive effects of climatic extremes and the lower-level variability which can impede growth, especially in economies dependent on agriculture. Funding for enhancing communities' capacity to anticipate and respond to disasters and reduce water-related disasters is also a sound investment.

Many countries already suffer from an infrastructure deficit, quite apart from new needs arising in the future. More resources are required for preparing investment proposals suitable to attract financing. A typical lead-time for major projects is 5 to 8 years so a rapid start up for infrastructure will be required to meet the goal. Once the goal is agreed, countries need to make an early approach to potential funders and make appropriate provisions in their own budgets.

Increasing the scale and pace of capital spending from current levels will call for a sharper focus on implementation, including the implementation of existing policies and plans available "off the shelf" in order to break the continuous cycle of 'policy-plan-policy' but no action. This will require more and better skilled staff in government and increased support from the private sector and civil society. The costs of human resource development need to be identified and funded, especially in low-income countries. Adopting the global goal for water should trigger more capacity development of all types - individual, organizational, partnership, community, etc.[73]New science and technology solutions need to be applied, including modeling, remote sensing etc., with capacities devolved more widely.

Monitoring, data and reporting implications:

[72] http://www.ilo.org/public/english/employment/recon/eiip/about/index.htm
[73] Lincklaen Arriëns, W. and Wehn de Montalvo, U. Exploring water leadership, Water Policy 15 (2013) 15–41

Much data to monitor progress is already available but requires enhancement, such as that already done for drinking water, sanitation and hygiene via the JMP, annual reporting based on country level household surveys and other nationally collected data.

National systems for monitoring and reporting access to WASH are generally well established. The WHO/UNICEF Joint Monitoring Programme on Water Supply and Sanitation global reporting mechanism was established in 1990 and currently reports every 2 years on progress towards existing MDG targets. Nationally representative household surveys are currently the main source of data used for developing countries while regulatory data is used in a smaller number of developed countries. It is expected that household surveys will remain a major source of data for global monitoring in the short term, with regulatory data becoming increasingly important after 2015.

The JMP working groups have developed detailed definitions of terms used in targets and indicators[74]. The proposed indicators build on those used to monitor MDG targets for drinking water and sanitation, thereby providing historical continuity. Data relating to basic levels of drinking water and sanitation service at home can be readily collected in most countries with small changes to existing household survey instruments. Data relating to higher levels of service, particularly water quality and safety and safe management of excreta, is currently less widely available in developing countries. The proposed hygiene indicators have been included in a limited number of household surveys to-date and would need to be included more systematically for global reporting. Data on WASH in schools and health facilities is currently available for less than 100 countries but UNICEF/UNESCO and WHO have established norms and standards and begun aggregating data at global level.

Indicators about the sustainability of water, sanitation and hygiene services correspond closely with those relating to water resources management and waste water/water quality. Effective global monitoring will depend on strengthening national regulatory and administrative reporting systems as captured by the water governance target. The proposed metric for monitoring progressive reduction/elimination of inequalities in access to WASH could equally be applied to health or education targets but will depend on better disaggregation of population data in future global monitoring.

At country level, additional monitoring of water resources, for rivers and aquifers, is necessary and will incur relatively minor costs but bring significant benefits. Monitoring networks have been in widespread decline for decades due to under-funding but there are low-cost opportunities to tap into the vast quantities of data collected through remote sensing, particularly related to land cover change. Data-sharing between countries, sectors and actors will often be cheaper than collecting data from scratch.

Much of the cost of synthesizing data at global level is already covered by existing UN systems such as the UN-Water Federated Water Monitoring System and Key Water Indicator Portal (FWMS & KWIP), FAO Aquastat, GEMS/Water and other databases on water resources and related production statistics. However, they will need some modifications and increased funding to improve spatial and temporal coverage of existing datasets, as well as incorporate

[74] http://www.wssinfo.org/fileadmin/user_upload/resources/Fact_Sheets_4_eng.pdf

data requirements of new indicators. Fresh approaches to data collection, aggregation and reporting need to be considered for domestic and industrial wastewater treatment and reuse.

The UN reporting architecture will need to adapt to the new SDG / post-2015 development agenda. For water, there are presently four key reports: the JMP, GLAAS, WRM Surveys and WWDR reports prepared by various UN agencies and partners. More coordination will be needed to avoid overlaps and duplication and to extend the scope beyond the present MDGs. UN-Water is well placed to coordinate the global monitoring and reporting mechanisms for the range of water targets. An effort should be made to avoid a plethora of new monitoring mechanisms, focusing instead on supporting national data collection linked to national data collection systems. Monitoring progress on some aspects of water resources management targets cannot be done with simple physical or numerical data, but will also require qualitative surveys. A report commissioned by a UN-Water working group[75] recommends that a survey similar to that prepared for the Rio+20 conference[76] should be carried out periodically, about every five years, costing in the order of USD 2 million a year.

The UN Statistics Division has studied proposed indicators that can be monitored using the methodologies established or being established in National Statistical Systems. This includes methodologies developed under the System of Environmental-Economic Accounting for Water (SEEA - Water)[77].

To have a monitoring and reporting system in place by the end of 2015 requires the completion of an inventory of regional water reporting systems additional to that of the UN system, for example the proposed AMCOW/AU reporting system. More detailed work will be needed on indicators before the 2015 General Assembly, including dialogues at the country level to determine the information needing to be collected and the local costs involved to measure progress in meeting the targets. Increasing the country level focus should not be at the cost of overburdening countries which lack human and financial resources for data collection. The UN could harmonize data collection at country level with a view to minimizing demands on local resources. Reporting systems at regional level should also be strengthened.

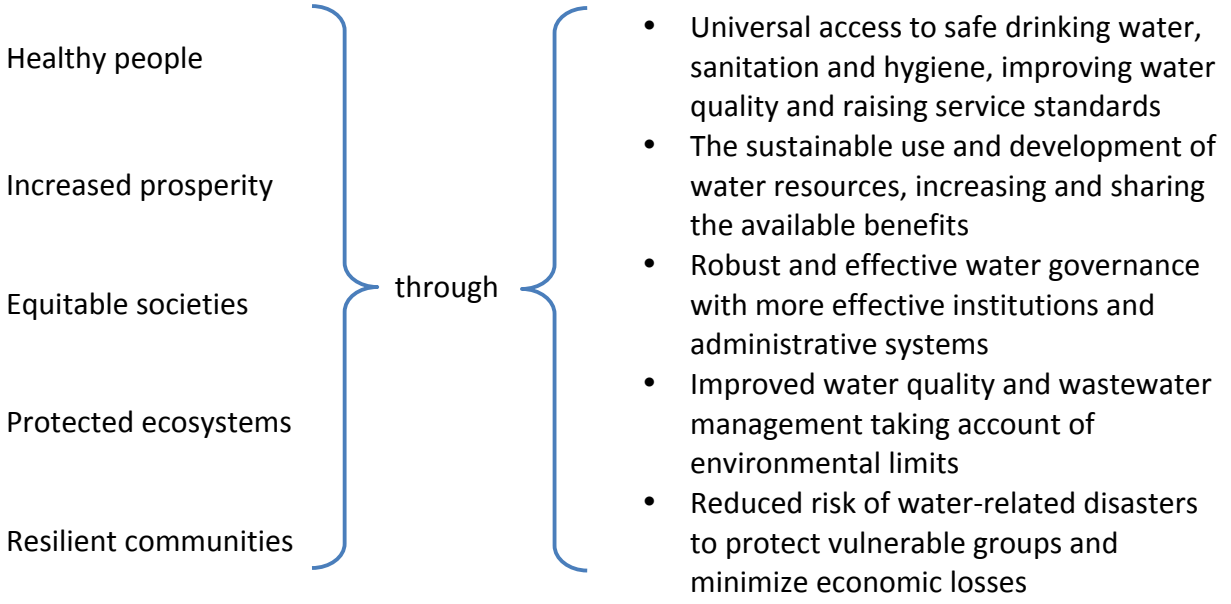
[75] Holmberg J, 2013, Options for a Periodic Monitoring and Reporting Framework for Integrated Approaches To Water Resources Management

[76] UNEP, UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management, 2012 as presented to the Rio+20 meeting.

[77] http://unstats.un.org/unsd/envaccounting/seeaw/

6 Concluding remarks

The suggested global goal for water builds on and extends existing commitments. A global goal for water is fundamental to all other development goals and the proposed framework applies to all countries. The targets for the goal for water have important explicit and implicit inter-linkages, making them mutually supportive. For example, improving access to drinking water and ensuring it is fairly shared requires good governance, balancing competing demands, and the protection of natural supply systems from pollution and water-related disasters. Furthermore, the goal for water and its targets is of direct importance to addressing other proposed areas within the post-2015 framework, such as health, energy, food, employment, gender equality and environmental sustainability. The water goal and targets thus directly address the development aims of societies, promotes human dignity and ensures achievements are sustainable over the long term leading to the following development outcomes, amongst others:



The paper indicates that the benefits outweigh by a wide margin the costs they will incur. The goal, target, and indicator structure will allow the benefits to become more obvious as progress is made and measurement demonstrates their worth.

These UN Water suggestions recognize that water needs both a goal in its own right and consideration in the formulation of other goals. Water is much more than a cross-cutting issue - unless the fundamental role of water and the water issues raised in this proposal can be resolved, other important elements of the new development agenda will be unachievable. Water and water infrastructure is a vital part of the foundations for sustainable development, poverty alleviation and human well-being. The strong interdependencies between water and other fundamentals such as energy and food require clearer recognition. For example, energy production requires water, just as water requires energy for its distribution, treatment and

collection. Food production requires both water and energy. At another level, public health or education can only be attained if the water supply and sanitation services of a community operate correctly. Good water management is also a key determinant in eliminating inequalities and gender bias.

The paper demonstrates the magnitude and urgency of the task that needs to be accomplished at the global scale. The size of the population without access to clean and safe water and sanitation is measured in billions of people. The demands for freshwater to meet growing human needs, the imperative for wastewater treatment to preserve and protect water quality and action to arrest the impact of nutrient pollution imply a major step change from Business As Usual.

UN Water believes that the process of preparing these suggestions has already contributed to a better understanding of the interrelationships and interconnections at work. Similar work in other domains is leading to opportunities for better convergence in defining goals and targets for action. The suggestions should be seen as part of an ongoing effort to bring together the social, economic and environmental elements of sustainable development. UN Water members and partners are looking forward to continuing the process and to working with other specialists and member states as the new development agenda takes shape.

ANNEX: Proposed Goal, detailed illustrative targets and associated indicators

A dedicated global goal for water:

Securing sustainable water for all

Target A: Achieve universal access to safe drinking water, sanitation and hygiene[78] [79]

Element 1: No Open Defecation "to eliminate open defecation"	**Element 2: Basic Access** "to achieve universal access to basic drinking water, sanitation and hygiene for households, schools and health facilities"	**Element 3: Safely Managed Services** "to halve the proportion of population without access at home to safely managed drinking water and sanitation services"	**Element 4: Equality** "to progressively eliminate inequalities in access"
Element 1 core indicators 1. Percentage of population practicing open defecation	**Element 2 core indicators** 1. Percentage of population using basic drinking water 2. Percentage of population using basic sanitation 3. Percentage of population with hand washing facilities at home 4. Percentage of health facilities with basic drinking water, basic sanitation and hygiene 5. Percentage of primary and secondary schools that have basic drinking water, basic sanitation and hygiene.	**Element 3 core indicators** 1. Percentage of population using a safely managed drinking water service at home 2. Percentage of population with basic sanitation whose excreta is safely managed	**Element 4 core indicators** 1. Data will be disaggregated by the four population groups urban/rural; rich/poor; slums/formal urban settlements; disadvantaged groups/general population 2. The difference in rate of change for the disadvantaged groups versus the general population

[78] Full wording of target: By 2030: To eliminate open defecation; to achieve universal access to basic drinking water, sanitation and hygiene for households, schools and health facilities; to halve the proportion of the population without access at home to safely managed drinking water and sanitation services; and to progressively eliminate inequalities in access

[79] (http://www.wssinfo.org/fileadmin/user_upload/resources/Fact_Sheets_4_eng.pdf provides a full list of supporting definitions and indicators

Desired outcomes/country actions

- Water allocation decisions and water withdrawals that take into account both human and Governments integrate open defecation targets within strategies for improving child survival and nutrition and reducing extreme poverty.
- Governments adopt ambitious targets for improving WASH service levels in order to reduce global burden of WASH related diseases, to improve productivity and economic growth, and to reduce inequalities between population groups
- Governments adopt ambitious targets in order to reduce global burden of disease from diarrhea and other WASH related diseases, improve child and maternal health, improve nutrition, improve (girls) education outcomes and reduce (gender) inequalities.

Target B: Improve by (x%) the sustainable use and development of water resources in all countries

Element 1: Bring freshwater withdrawals in line with sustainably available water resources
Element 2: Restore and maintain ecosystems to provide water-related services
Element 3: Increase water productivity for all uses

Element 1 core indicators

1. Change in withdrawal-to-availability ratio (change in withdrawals as % of total actual renewable water resources, within sustainable limits)
2. % of basins with an allocation framework (balancing demands for all sectors, including the environment, from groundwater and surface water)
3. Storage capacity per capita/% of available water

Element 2 core indicators

1. % change in freshwater ecosystem area and condition (indicator of change in ecosystem extent and health, includes brackish ecosystems)
2. Threatened Species (Red List) Index and Living Planet Index (for relevant flora and fauna)
3. Environmental water stress (based on deviation from natural flow/availability)

Element 3 core indicators

1. Change in agricultural GDP per agricultural withdrawals (agricultural water productivity)
2. Change in industrial GDP per industrial withdrawals (industrial water productivity)
3. Change in electricity production per unit of water (energy sector water productivity)
4. Change in withdrawals for domestic use per capita (domestic water supply and use efficiency)

Desired outcomes/country actions

- Water allocation decisions and water withdrawals that take into account both human and environmental water needs and impacts of water use on freshwater ecosystems, ensuring sustainable withdrawals in the long term.
- Ensuring ecosystem health and capacity to be able to supply water of a sufficient amount and quality for human uses.
- Countries take actions towards increasing available supply and productivity in the main water use sectors. The productivity and efficiency indicators are used to set targets and inform decision-makers of priority intervention areas.

Target C: All countries strengthen equitable, participatory and accountable water governance	
Element 1: Implement integrated approaches to water management at local, basin and national levels including participatory decision-making **Element 2:** Deliver all drinking water supply, sanitation and hygiene services in a progressively affordable, accountable, and financially and environmentally sustainable manner **Element 3**: Ensure regulatory frameworks are in place for water resources, infrastructure and services, and enhance the performance of responsible public authorities and their water operators. **Element 4:** Strengthen knowledge transfer and skills development.	
Element 1 core indicators:	**Element 2 core indicators:**
1. Percent of countries implementing IWRM plans 2. Percent of countries with strategic planning and participatory decision-making processes 3. Percent of transboundary basins and aquifers with cooperative management frameworks 4. Percent of countries with national policies supporting integrated disaster risk management (including drought and flood policies), as part of national development plans 5. Proportion of communities which have implemented risk strategies 6. Monitoring and evaluation systems that include surveys on governance issues (building on Rio+20 status report)	1. Percentage of population using water and sanitation service providers registered with a regulatory authority (disaggregate rural and urban) 2. Percentage of population in the poorest quintile whose financial expenditure on water, sanitation and hygiene is below 3% of national poverty line (disaggregate rural and urban) 3. Ratio of annual revenue to annual expenditure on maintenance (including operating expenditures, capital maintenance, debt servicing) 4. Ratio of annual expenditure on maintenance (including operating expenditures, capital maintenance, debt servicing) to annualized value of capital assets.
Element 3 core indicators:	**Element 4 core indicators:**
1. Number of countries with regulatory frameworks and enforcement capacity 2. Proportion of responsible water authorities and water operators for which operational performance is measured and reported	1. No. of institutions using relevant education and training materials in local capacity building programs. 2. No. of capacity building networks using multidisciplinary skills of competent members to scale up capacity building and actively support implementation programs. 3. No. of countries with knowledge management systems in place that ensure access to the best of international and local knowledge and measure the effectiveness of capacity building services through locally developed indicators and monitoring systems.
Desired outcomes/country actions • Countries have an enabling environment established that supports an integrated approach to water resources management and cohesive policies across the range of water users (sectors) and at different administrative levels (regional, national, basin, local). • Water and sanitation are embedded within National Development Plans and budgets.	

- Societies take account of risks from water-related hazards and make risk-based decisions and investments to enhance preparedness and resilience.
- Nations establish institutional frameworks to integrate water disaster management into everyday water management activities and design policies and programs to assist communities in managing risks.
- Governments invest in strengthening drinking water supply and sanitation policy and institutional arrangements to ensure that improvements in services are sustained and that inequalities in access between population groups are progressively reduced.
- Countries put in place policies and regulations that lead to a reduction in the negative impacts of pollution, starting with, but not limited to the priority to reduce nitrogen and phosphorous pollution.
- A systematic global monitoring framework for water development, management and use established, which allows for prioritizing resources and identifying key areas of importance.

Target D: Reduce wastewater pollution and improve water quality by reducing untreated domestic and industrial wastewater by (x%); increasing wastewater reused safely by (y%); and reducing nutrient pollution by (z%) to maximize water resource availability and improve water quality.

Element 1: Reducing untreated domestic and industrial wastewater (including point source agricultural) by (X%);

Element 2: Increasing wastewater reused safely by (Z%);

Element 3: Reducing nutrient pollution by (Y%)

Proposed core indicators

1. Proportion of the population for whom all domestic wastewater is treated to national standards in either collective or individual facilities.
2. Proportion of industrial (and point source agricultural) wastewater flows not collected in public systems that is treated to national standards.
3. Proportion of the flows of treated municipal wastewater that are directly and safely reused
4. Proportion of the flows discharged by industrial wastewater treatment plants that are safely re-used. *(This indicator does not include water directly re-used without leaving the factory)*
5. Proportion of receiving water bodies meeting water quality standards (nitrogen & phosphorous as a minimum)

Proposed Supporting indicators

1. Proportion of the population connected to collective sewers or with on-site storage of all domestic wastewaters

Desired outcomes/country actions

- Stimulate action in countries to ensure the collection and treatment of used water and related pollutants arising from domestic water users and from 'point sources' of industry and agriculture so as to protect human health, the environment and ecosystems.
- Countries take actions towards increasing the amounts of used water that are re-used or recycled for beneficial purposes, thus contributing to satisfy sustainably all water needs
- Countries put in place policies and regulations that lead to prevention of pollution and a reduction in the negative impacts of diffuse pollution, starting with, but not limited to the priority to reduce nitrogen and

phosphorous pollution.

Target E: Reduce mortality by (x%) and economic loss by (y%) from natural and human-induced water-related disasters

Element 1: Increased knowledge and understanding of nations with respect to communities at risk to water-related disasters, especially in a changing climate;
Element 2: Adoption of integrated disaster risk management, including an appropriate mix of structural and non-structural approaches, to reduce mortality and economic losses for water-related disasters;
Element 3: Adoption and implementation by nations of monitoring and people-centered early warning systems for communities at most risk to water-related disasters; and
Element 4: Application of an end-to-end preparedness approach to water-related disaster management which sees the needs of user communities being met, to the last mile.

Proposed core indicators

1. Mortality due to water-related disasters and mortality within vulnerable groups and by gender
2. Direct economic losses due to water-related disasters, as percentage of GDP
3. Proportion of at-risk communities with effective people-centred early warning systems for water-related disasters.
4. Proportion of nations that have assessed their risk of water-related disaster and that have established plans and strategies for integrated disaster risk management, including monitoring systems and preparedness.

Supporting indicators

- Number of total victims per disaster (persons)
- Gender of victims per disaster (male/female)
- Age of victims per disaster (year)
- Income of victims per disaster (USD)
- Direct economic losses per disaster (USD)

Desired outcomes/country actions

- At-risk communities implement hazard-specific early warning systems and evaluate effectiveness of their systems with respect to lead time and accuracy of forecasts and efficiency of dissemination.
- Countries understand trends in disaster impacts and are able to make informed decisions as to investments in disaster risk mitigation and preparedness. Leaders are aware of the impact of disasters to vulnerable groups and are able to tailor policies to address the specific root causes of vulnerability in their country.
- Economic losses reduced and livelihoods improved for vulnerable communities