UNITED NATIONS

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Distr.
LIMITED
E/ESCWA/SDPD/2016/WP.1
31 March 2016
ORIGINAL: ENGLISH

Economic and Social Commission for Western Asia (ESCWA)

Drawing on the MDG+ Initiative for Informing the Water-related SDGs in the Arab Region

Working Paper

16-00089

Acknowledgements

This working paper was prepared by Mr. Ali Karnib, Water and Sanitation Expert in the Water Resources Section of the Sustainable Development Policies Division (SDPD) at the United Nations Economic and Social Commission for Western Asia (ESCWA). It was reviewed by Ms. Carol Chouchani Cherfane, Chief of the Water Resources Section.

The paper was prepared within the framework of the MDG+ Initiative, which was launched under the auspices of the Arab Ministerial Water Council to establish a regional mechanism for improved monitoring and reporting on access to water and sanitation services in the Arab Region. Funding for the MDG+ Initiative is provided by the Swedish International Development Cooperation Agency (Sida).

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Abbreviations

ACWUA	Arab Countries Water Utilities Association
AMWC	Arab Ministerial Water Council
AWC	Arab Water Council
CEDARE	Centre for Environment and Development for the Arab Region and Europe
CPW	Proportion of Population Connected to Piped Water Network
CPS	Proportion of Population Connected to Piped Sewer Network
DESA	United Nations Department of Economic and Social Affairs
ESCWA	United Nations Economic and Social Commission for Western Asia
FAO	Food and Agriculture Organization of the United Nations
GEMI	Global Expanded Water Monitoring Initiative
GEMS/WATER	Global Water Quality Monitoring Programme of the UNEP
GLAAS	UN-Water Global Analysis and Assessment of Sanitation and Drinking Water
IAEG-SDGs	Inter Agency and Expert Group on Sustainable Development Goal indicators
IWRM	Integrated Water Resources Management
JMP	Joint Monitoring Programme for Water Supply and Sanitation
LAS	League of Arab States
MDG	Millennium Development Goal
NFP	National Focal Point
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
RAED	Arab Network for Environment and Development
SDG	Sustainable Development Goal
SEEA	System of Environmental-Economic Accounting
SMW	Proportion of Population Using Safely Managed Drinking Water Services
SNA	System of National Accounts
STW	Proportion of Safely Treated Wastewater
UNEP	United Nations Environment Programme
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN-Habitat	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
UNSD	United Nations Statistics Division
WHO	World Health Organization
WSKIS	Water and Sanitation Key Indicator Survey

Executive summary

The United Nations Sustainable Development Summit in September 2015 led to the adoption of the 2030 Agenda for Sustainable Development which includes 17 Sustainable Development Goals (SDGs) that aim to guide global action on the achievement of a common set of development objectives for the coming fifteen years. The SDGs are the outcome of a highly advisory process that engaged governments, experts and civil society in global, regional and national-level dialogues on their development priorities. The SDGs replace the eight Millennium Development Goals (MDGs), which were formulated based on the declaration emanating from the Millennium Summit in September 2000.

The SDGs present a broader, more comprehensive set of goals than those put forth in the MDGs. Social, economic and environmental aspects are well-covered, with several goals aimed at achieving universal access to basic needs and services for all, and targets giving repeated emphasis to consider the needs of women and vulnerable groups. Given the breadth of this inclusive and visionary agenda, Member States will need to decide if they wish to pursue all sustainable development goals and targets based on the proposed indicator framework, or if they wish to be selective and pursue progress in the areas deemed to be of highest priority.

The United Nations Statistical Commission established the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) in March 2015 to prepare a global indicator framework for monitoring progress towards the achievement of 17 SDGs and their 169 targets. The resulting framework includes over 220 indicators, with at least one indicator identified to measure progress related to each target. The SDG indicators will serve to measure progress towards sustainable development and to help ensure the achievement of the SDG targets. The indicators and their associated data records will be the basis of monitoring progress towards the SDG targets at national, regional, and global levels.

Regional experience in data collection and reporting on the water-related indicators can inform Arab preparation and follow-up on the water-related SDGs. Of particular note is the MDG+ Initiative, which was launched by the Arab Ministerial Water Council in 2010 to establish a regional mechanism for monitoring and reporting on access to water supply and sanitation services in the Arab Region. The initiative provides reliable information on access to water supply services in Arab States based on a set of regionally approved indicators, a harmonized methodology and data collected and vetted by National Monitoring Teams comprised of ministries responsible for water, water and sanitation utilities and national statistical offices. The MDG+ Initiative framework includes indicators that measure water consumption, drinking water quality, accessibility, affordability, and continuity of supply, as well as sanitation-related indicators related to accessibility, affordability, wastewater treatment, wastewater type of treatment and wastewater reuse.

The MDG+ Initiative builds on the two water and sanitation indicators included in the MDGs and addresses several of the issues now included in the water-related SDGs. There are several commonalities between the MDG+ indicators and those now put forth under SDG-6, which aims to "Ensure availability and sustainable management of water and sanitation for all." The monitoring framework, data files and results of indicators generated and disseminated under the MDG+ Initiative could thus serve as a basis for informing several of the water-related SDG targets.

Specifically, a potential interconnection exists between the MDG+ indicators and the SDG targets 6.1, 6.2 and 6.3. The current MDG+ indicator framework could also be used to evaluate the proposed indicators SDG-6.1.1, SDG-6.2.1 and SDG-6.3.1 at the piped water supply and sewerage systems level. The institutional framework established under the MDG+ Initiative can also be drawn upon to support regional cooperation and follow-up on the other water-related SDGs.

In view of expanding the scope of the MDG+ Initiative, the indicator framework could include monitoring and reporting of on-site water supply and sanitation systems, such as tube wells borehole, protected spring, rainwater harvesting, septic tanks, pit latrines, and composting toilets in addition to the piped water supply and sewerage systems. The addition of such type of water sources and sanitation facilities indicators would necessitate obtaining data from household surveys. The upgraded MDG+ Initiative framework could then combine data sources from service providers with that of consumers to generate comprehensive datasets that report on the various aspects influencing access to services that are provided both inside and outside of service networks.

The formulation and collaborative implementation of the MDG+ Initiative offers a successful example of regional water cooperation among Arab States. Arab States could thus draw upon the indicator and institutional frameworks set up under the MDG+ Initiative to inform the development of a regional monitoring and reporting frameworks for regional follow-up on water-related SDGs.

ملخص تنفيذي

تم اعتماد خطة التنمية المستدامة لعام 2030 في قمة الأمم المتحدة في أيلول/سبتمبر عام 2015 والتي تتضمن سبعة عشر هدفا للتنمية المستدامة ترمي الى توجيه العمل العالمي لتحقيق مجموعة مشتركة من الأهداف الإنمائية خلال فترة الخمسة عشر سنة القادمة. ان أهداف التنمية المستدامة هي نتاج تشاور حول الأولويات الإنمائية تم بمشاركة الحكومات والخبراء والمجتمع المدني في حوار على المستوى الوطني، الإقليمي والعالمي. أهداف التنمية المستدامة أتت لتحل محل الأهداف الإنمائية للألفية التي صيغت على أساس الإعلان المنبثق عن مؤتمر قمة الألفية في أيلول/سبتمبر عام 2000.

ان أهداف التنمية المستدامة تمثل مجموعة أهداف أشمل وأوسع من تلك الواردة في الأهداف الإنمائية للألفية. الجوانب الاجتماعية والاقتصادية والبيئية تم تغطيتها بشكل وافي من خلال العديد من الغايات الرامية إلى تحقيق حصول الجميع على الاحتياجات والخدمات الأساسية، بالاضافة الى التركيز المتكرر للنظر في احتياجات النساء والفئات الضعيفة. ان اتساع نطاق هذا البرنامج الشامل والرؤيوي سوف يحتم على الدول الأعضاء أن يقرروا ما إذا كانوا يرغبون في متابعة جميع أهداف وغايات التنمية المستدامة من خلال اعتماد إطار المؤشرات المقترح أو متابعة التقدم المحرز في مجالات منتقاة يعتبرونها ذات أولوية قصوى.

أنشأت اللجنة الإحصائية التابعة للأمم المتحدة "*مجموعة الوكالات المشتركة وفريق الخبراء المعني بمؤشرات أهداف التنمية المستدامة*" (*IAEG-SDGs*) في أذار/مارس 2015 لإعداد إطار عالمي للمؤشرات لرصد التقدم المحرز نحو تحقيق أهداف التنمية المستدامة الـ17 وغاياتها الـ169. ويشمل الإطار المقترح أكثر من 220 مؤشر، حيث تم تحديد مؤشر واحد على الأقل لقياس التقدم المحرز لكل هدف. إن المؤشرات المقترحة والبيانات المرتبطة بها تشكل البنية الأساسية لرصد التقدم المحرز نحو تحقيق غايات وأهداف التنمية المستدامة على المستويات الوطنية والإقليمية والعالمية.

ان الخبرات الاقليمية في جمع البيانات وإعداد التقارير حول المؤشرات المتعلقة بالمياه يمكن أن تشكل رافعة للتحضيرات الجارية على مستوى المنطقة العربية للرصد والابلاغ عن أهداف التنمية المستدامة وخصوصا تلك المتعلقة بالمياه. تجدر الإشارة بشكل خاص إلى مبادرة MDG+ التي أطلقها المجلس الوزاري العربي للمياه عام 2010 لإنشاء آلية إقليمية لتحسين الرصد والإبلاغ بشأن الحصول على إمدادات المياه وخدمات الصرف الصحي في المنطقة العربية. يمكن من خلال مبادرة MDG+ الحصول على معلومات موثوقة عن الوصول الى خدمات إمدادات المياه والصرف الصحي في الدول العربية استنادا إلى مجموعة من المؤشرات المعتمدة إقليميا ومن خلال منهجية موحدة لجمع البيانات التي يتم اعتمادها من قبل فرق المتابعة الوطنية التي تتألف من مندوبين عن الوزارات المسؤولة عن مرافق امداد المياه والصرف الصحي ومكاتب الإحصاء الوطنية. يشمل إطار مبادرة MDG+ مجموعة من المؤشرات التي تقيس استهلاك المياه، نوعية مياه الشرب، وسهولة الوصول الى مصادر المياه، القدرة على تحمل التكاليف، واستمرارية الإمداد، بالاضافة الى مؤشرات الصرف الصحي التي تقيس إمكانية الوصول الى مرافق الصرف الصحي، القدرة على تحمل التكاليف، ومعالجة مياه الصرف الصحي، نوعية المعالجة وإعادة استخدام المياه العادمة.

ان منطلق مؤشرات مبادرة MDG+ هو مؤشري المياه والصرف الصحي العائدين للأهداف الإنمائية للألفية، يمكن لمؤشرات مبادرة MDG+ ان تعالج العديد من القضايا المتعلقة بالمياه والمدرجة في أهداف التنمية المستدامة. هناك مؤشرات مشتركة بين أهداف التنمية المستدامة المتعلقة بالمياه وتلك العائدة لمبادرة MDG+ بحيث يمكنها ان تسهم بشكل مباشر في احتساب غايات أهداف التنمية المستدامة المتعلقة بالمياه. وبالتالي، يمكن استخدام بيانات ومؤشرات مبادرة MDG+ كأساس للإبلاغ عن بعض غايات وأهداف التنمية المستدامة المتعلقة بالمياه في المنطقة العربية.

أظهرت دراسة الترابط بين الغايات 6.1، 6.2 و6.3 ومؤشرات مبادرة MDG+ انه يمكن استخدام هذه الأخيرة لاحتساب مؤشرات أهداف التنمية المستدامة 6.1.1، 6.2.1 و6.3.1. وكذلك يمكن الاستفادة من الإطار المؤسسي لمبادرة MDG+ لدعم التعاون الإقليمي واحتساب أهداف التنمية المستدامة الأخرى المتعلقة بالمياه.

ان توسيع نطاق مبادرة +MDG يمكن ان يشمل، بالاضافة الى المؤشرات المتعلقة بأنظمة شبكات إمدادات المياه والصرف الصحي، مؤشرات للرصد والإبلاغ عن نظم إمدادات المياه والصرف الصحي الموقعية مثل الآبار الانبوبية، الآبار الارتوازية، الينابيع المحمية، جمع مياه الأمطار، خزانات التحلل، حفر الامتصاص. ان احتساب مؤشرات النظم الموقعية يتطلب الحصول على بيانات من مسوح واستبيانات الأسر المعيشية. يمكن من خلال الإطار الموسع لمبادرة +MDG الجمع بين مصادر البيانات المتأتية من مقدمي الخدمة ومن متلقي الخدمة لانتاج بيانات شاملة لتغطية مختلف الجوانب التي تؤثر على الوصول إلى خدمات امدادات المياه والصرف الصحي من خلال نظم الشبكات او النظم الموقعية.

ان تنفيذ اطار مبادرة +MDG المبني على صيغة تشاركية يقدم نموذجا ناجحا للتعاون الإقليمي حول المسائل المتعلقة بالمياه بين الدول العربية. وبالتالي يمكن للدول العربية الاستفادة من الاطار المؤسساتي الذي أنشئ من خلال مبادرة +MDG لتطوير أطر الرصد والإبلاغ الإقليمية ومتابعة أهداف التنمية المستدامة المتعلقة بالمياه على المستوى الأقليمي.

I. Introduction

The 2030 Agenda for Sustainable Development was adopted at the United Nations Sustainable Development Summit in September 2015 and includes seventeen Sustainable Development Goals (SDGs) whose progress is monitored and reported upon through 169 targets (United Nations, 2015). The SDGs aim to guide global action on the achievement of a common set of development objectives for the coming fifteen years. They replace the eight Millennium Development Goals (MDGs), which were formulated based on the declaration emanating from the Millennium Summit in September 2000.

The Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) was established by the United Nations Statistical Commission in March 2015 to formulate a global indicator framework for monitoring progress towards the achievement of the SDGs and their associated targets (UNSTATS, 2015). The IAEG-SDGs consultation process started in March 2015 and is outlined in Figure 1 (UNSTATS, 2015). The IAEG-SDGs submitted its proposal for deliberation by the United Nations Statistical Commission at its 47th Session in March 2016, and continues its deliberations on methodological matters and reporting mechanisms. The proceedings and actions taken by the United Nations Statistical Commission will subsequently be reported to the United Nations Economic and Social Council for consideration.

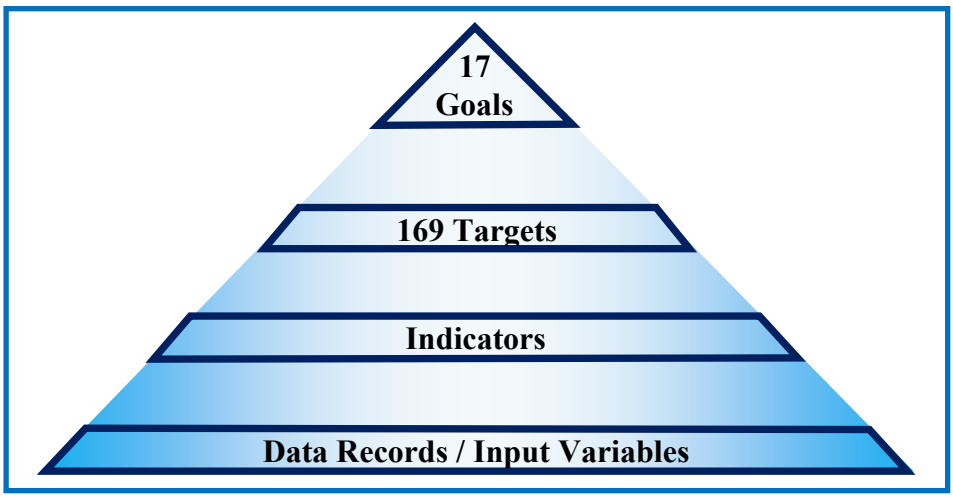
Figure 1. The IAEG-SDGs consultative process

March 2015	**Establishment of the IAEG-SDGs.**
May 2015	First list of indicator proposals and associated metadata
June 2015	First meeting of the IAEG-SDGs
July 2015	List of indicator proposals incorporated all additional or updated inputs
September 2015	Updated list of proposals containing all proposed modification and proposals for additional indicators under each target
October 2015	Second meeting of the IAEG-SDGs
November 2015	Finalization of the list of proposed indicators and proposal for an indicator framework
March 2016	Presentation by the IAEG-SDGs of an indicator framework at the forty-seventh session of the Commission for its review and approval
September 2016	**General Assembly endorsement of the agreed proposal**

The resulting framework includes over 220 indicators, with at least one indicator identified to measure progress related to each target. Figure 2 illustrates the pyramid of the SDGs, targets, indicators and input variables.

The SDG indicators and their associated data records (input variables) will serve to monitor progress towards the SDG targets at national, regional, and global levels. These are determined at the technical level through inter-governmental processes based on the global goals and targets that were negotiated and agreed upon in the 2030 Agenda for Sustainable Development.

Figure 2. SDGs, targets, indicators and data records pyramid



A. The MDG+ Initiative

The MDG+ Initiative was launched by the Arab Ministerial Water Council in 2010 to establish a regional mechanism for monitoring and reporting on access to water supply and sanitation services in the Arab Region and it is implemented under the auspices of the Arab Ministerial Water Council by the United Nations Economic and Social Commission for Western Asia (ESCWA), the League of Arab States and the Arab Countries Water Utilities Association (ACWUA) with funding provided by the Swedish International Development Cooperation Agency (Sida). The initiative focuses on 10 regional indicators and 25 sub-indicators related to drinking water, water supply, sanitation, wastewater treatment and reuse. The first MDG+ Initiative report (LAS, ESCWA, ACWUA, 2015) includes data records on the indicators from 11 Arab States. The second MDG+ Initiative report (LAS, ESCWA, ACWUA, 2016 *forthcoming*) includes data records for 18 Arab States.

Close look into the MDG+ Initiative indicators and the SDG targets and their associated set of proposed indicators expose several commonalities between global and regional priorities of concern when monitoring access to water and sanitation. This offers a potential to draw lessons from the MDG+ Initiative to inform monitoring and reporting on the water-related SDGs, and particularly in the areas of water supply, sanitation and wastewater treatment and reuse.

This paper reviews the MDG+ indicator framework and associated monitoring and reporting mechanism in light of suggesting ways in which this regional initiative can support monitoring and reporting the water-related SDGs in the Arab Region.

II. The Move from the MDGs to the MDG+ Initiative

A. The MDGs Water-related Targets and Indicators

The MDGs did not include a stand-alone goal for water. Water instead was addressed within MDG 7 related to environmental sustainability, although it was also evident as a cross-sectoral issue that affected the achievement of nearly all the other MDGs, such as those related to poverty, health and education.

Specifically, water resources management was addressed under target 7A, which aimed to "*integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources*". For water use, this target was translated into indicator 7.5, which called for monitoring the "*proportion of total water resources used*". While target 7A clearly indicated the need to reverse the unsustainable use of water resources, it did not set a quantitative target upon which achievements would be measured. However, such targets could be an important measure in water-scarce areas, such as the Arab region, where growing water demand coupled with limited water availability result in a negative trend for this indicator (ESCWA, 2013). However, indicator 7.5 only measures the unsustainable use of water resources as a ratio of water use to water availability. In doing so, it fails to provide a complete picture of the influencing factors, such as natural water scarcity, low water use efficiency and/or dependency on non-conventional water resources, which may also contribute to an unsustainable situation. Consequently, this indicator may be considered an indicator of natural water availability or scarcity within the context of the environmental sustainability goal. However, it is not sufficient to reflect upon or measure progress or efforts that drive a development agenda towards better management of freshwater resources (ESCWA, 2013).

Water supply and sanitation were addressed by the Goal 7 on "*ensuring environmental sustainability*". Target 7C aimed to halve, by 2015, the proportion of people without sustainable access to improved drinking water sources and sanitation facilities by the year 2015. The target was measured by the indicators 7.8 and 7.9 listed in table 1 below. The baseline year for measuring progress toward this target was set as 1990.

Table 1. Water supply and sanitation target and indicators of the MDG 7

Target	**Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation**	
Indicators	7.8	Proportion of population using an improved drinking water source
	7.9	Proportion of population using an improved sanitation facility

The Joint Monitoring Programme for Water Supply and Sanitation (JMP), which was launched by the by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) in 1990, was adopted as the official United Nations mechanism for monitoring progress towards MDG 7, Target 7C in 2002. The JMP reports draw on survey and census data that are plotted on a time scale. This data was generated from the year 1980 to 2002 and then a linear trend line, based on the least-squares method, was drawn through these data points to estimate coverage for 1990 and 2002 to set a baseline for monitoring and reporting on these two indicators (WHO & UNICEF, 2004).

The JMP indicators are calculated to determine coverage based on the use of an improved and unimproved drinking water and sanitation facility, and its proximity to the consumer based on responses gathered from household surveys and reviewed by ministries of health. For this reason, the rationale behind the different categories that define "*improved drinking water source*" and "*improved sanitation facility*" is framed within the context of monitoring improvements in public health (ESCWA, 2013), as a means to reflect what is "*safe drinking water"* and *"basic sanitation,"* as per the MDG target.

Several challenges were evident in this approach. Firstly, the data used to monitor the MDG 7 water-related indicators was spotty. Data on access to water supply and sanitation was drawn from national censuses data based on household surveys, which are generally conducted every five to ten years on irregular intervals. Calculations were also made based on the application of a linear extrapolation method to provide country-level data on the indicators for the years where no survey data existed. Poor maintenance of water and sanitation infrastructure, as well as the damage and destruction caused to water infrastructure due to conflicts, crises and occupation affecting the Arab region, put into question the effectiveness of using a linear extrapolation method based on the direction of the data trends in a dynamic environment such as the Arab region.

Furthermore, while the MDG indicators are important to consider, the JMP monitoring framework does not address the quantity or quality of water and sanitation services accessed by the population. As such, issues of importance to water-scarce regions, such as the Arab region, are not examined in this monitoring framework including issues related to the continuity of water supply, whether the wastewater treated from sanitation services is treated and reused, and what is the quality of water provided for drinking and domestic uses, particularly in regions where wastewater remains untreated and simply released into surface and groundwater resources. This demonstrates the need to develop additional region-specific indicators that can more appropriately reflect the delivery of water supply and sanitation services in the different Arab countries.

B. The MDG+ Initiative Indicator Framework

The Regional Initiative for Establishing a Regional Mechanism for Improved Monitoring and Reporting on Access to Water Supply and Sanitation Services in the Arab Region (MDG+ Initiative) is the outcome of a series of resolutions adopted by the Arab Ministerial Water Council requesting ESCWA to lead the establishment of a regional coordination mechanism for improved monitoring and reporting on water supply and sanitation indicators in the Arab region. The initiative is based on a set of indicators that were vetted and endorsed by the Arab Ministerial Water Council based on the interest of Arab States to consider an additional set of indicators for monitoring access to water and sanitation services in the Arab region.

The MDG+ Initiative is comprised of four main components, namely a:

- **Data component** - that collects information on a set of region-specific water supply and sanitation indicators based on an approved questionnaire template. Pilot field surveys are also conducted to complement the national datasets.
- **Training component** - that included the preparation of training materials and an e-tool for supporting data collection in a harmonized manner.

- **Institutional component** - that is centered on the set-up of National Monitoring Teams led by National Focal Points.
- **Policy component** - that examines the MDG+ Initiative indicators and monitoring and reporting mechanism in light of the adopted SDGs.

Table 2 presents the MDG+ Initiative set of region-specific indicators that take into account the challenges affecting access to water and sanitation services in the Arab Region.

Table 2. MDG+ Initiative Indicators

MDG+ Indicators on Water Supply	MDG+ Indicators on Sanitation
Water Consumption	Treated Quantity
Continuity of Supply	Treatment Type
Water Quality	Reuse Utilization
Tariff Structure	Reuse Type
Affordability	Tariff Structure
-	Affordability

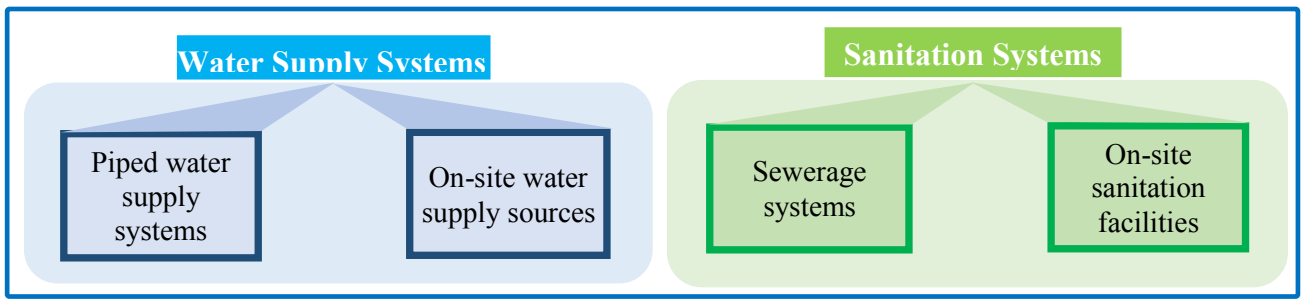
Detailed descriptions of these indicators, their methods of calculation and the developed excel tool could be found in ESCWA (2013), ESCWA (2014a) and ESCWA (2014b) respectively.

The MDG+ indicators related to water supply and sanitation systems are divided into two main categories, as illustrated in Figure 3:

(a) **Piped water supply and sewerage systems:** which represent water supply and sewerage networks that are generally managed by local government, utility (service providers) or regulators and they are usually considered as the "proper" solution for water supply and sanitation in urban areas. The service providers or regulators possess authentic technical and operational data related to these systems, wherefore the evaluation of MDG+ indicators are performed based on service providers' data records.

(b) **On-site water supply and sanitation systems:** which represent off-network water supply sources (include tube well, borehole, protected spring, rainwater harvesting) and sanitation facilities (septic tanks, pit latrines, and composting toilets). Such systems are usually owned and managed at the household level, therefore, it is difficult to obtain accurate data on the operation of these systems. Household level indicators necessitate the use of data obtained from household surveys, censuses and simulation methods.

Figure 3. Levels of water supply and sanitation services



Tables 3 and 4 summary the proportion of population using water supply and sanitation systems according to the above mentioned types of classification in 11 Arab countries which are estimated based on data included in the first MDG+ Initiative report for urban and rural areas (LAS, ESCWA, ACWUA, 2015).

That noted, in some Arab countries water scarcity constraint and infrastructure limitations may lead on-site systems to be managed as part of the services managed by national water authority (utility). For example, in Oman the percentage of treated wastewater collected by the sewerage network is 33% of the total treated wastewater. The remaining 67% of treated quantities is collected from septic tanks by trucks provided by the concerned wastewater authority. (LAS, ESCWA, ACWUA, 2015).

Table 3. Proportion of population using water supply systems

Country	Piped water supply systems		On-site water supply sources	
	Urban (%)	*Rural (%)*	*Urban (%)*	*Rural (%)*
Bahrain	100	NA	0	NA
Egypt	100	92.1	0	7.9
Iraq	91.3	83.8	8.7	16.2
Jordan	93	NA	7	NA
Kuwait	98.4	NA	1.6	NA
Libya	64.5	64.5	35.5	35.5
Oman	71.7	NA	28.3	NA
Palestine	90	44.3	10	55.7
Qatar	100	NA	0	NA
Tunisia	100	93.4	0	6.6
UAE	80.4	NA	19.6	NA

NA: Not applicable (which means that the urban values represent the urban and rural (national values))
Source: Compiled by the author based on the MDG+ Initiative First Report (2015) (It is assumed that population using on-site water supply systems are those who are not reported served by piped water supply)

Table 4. Proportion of population using sanitation systems

Country	Sewerage systems		On-site sanitation facilities	
	Urban	*Rural*	*Urban*	*Rural*
Bahrain	99.5	NA	0.5	NA
Egypt	97	28.1	3	71.9
Iraq	40.4	0	59.6	100
Jordan	70.1	NA	29.9	NA
Kuwait	98.4	NA	1.6	NA
Libya	56.3	46.7	43.7	53.3
Oman	15.3	NA	84.7	NA
Palestine	63	2.1	37	97.9
Qatar	94.3	NA	5.7	NA
Tunisia	80.2	0	19.8	100
UAE	35.7	NA	64.3	NA

NA: Not applicable (which means that the urban values represent the urban and rural (national values))
Source: Compiled by the author based on the MDG+ Initiative First Report (2015) (It is assumed that population using on-site sanitation facilities are those who are not reported served by sewerage systems)

With the exception of Libya, Oman and United Arab Emirates (UAE), table 3 shows that more than 90% of the population in eight Arab countries has access to piped water supply systems in urban areas. The proportion of population still using off-network water supply systems in rural areas remains considerably high in Iraq, Libya and Palestine.

On the other hand, with the exception of Bahrain, Kuwait and Qatar, table 4 shows that the proportion of population using off-network sanitation facilities in rural areas are considerably high in eight Arab countries.

The MDG+ Initiative indicator framework for water supply and sanitation systems includes evaluation of indicators at the piped water supply and sewerage systems levels (figures 4 & 5).

Figure 4. MDG+ Initiative indicator framework for water supply

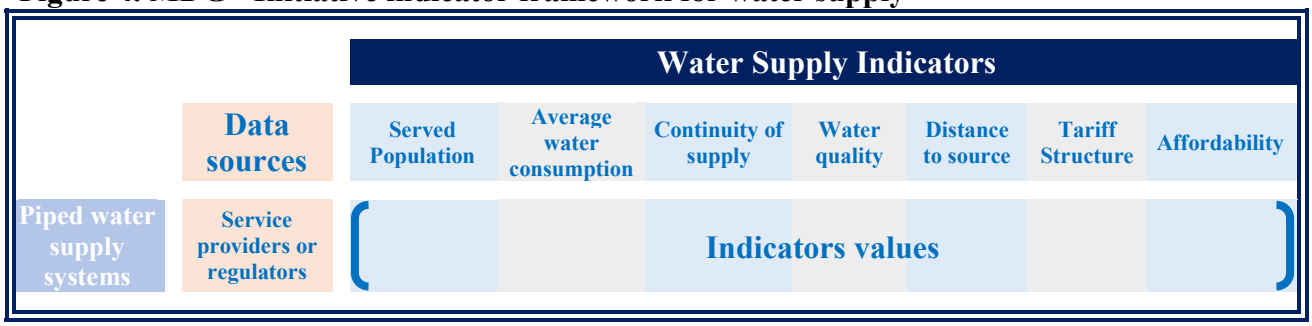
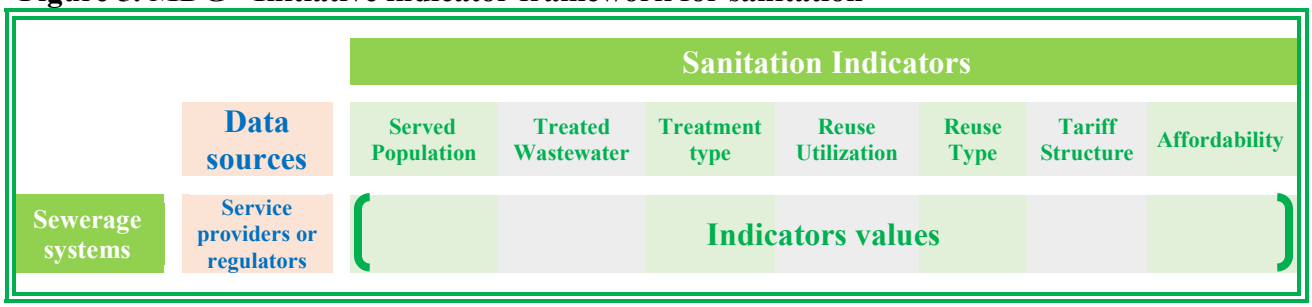


Figure 5. MDG+ Initiative indicator framework for sanitation



The evaluation of water supply and sanitation indicators at the piped systems level shown in figures 4 and 5 are based on data records provided by the concerned service utilities. The MDG+ Initiative monitoring and reporting mechanism is presented in the next section. The possible extension of the MDG+ Initiative indicator framework to include off-network water supply and sanitation systems will be discussed in section IV-E.

C. The MDG+ Initiative Institutional Framework

The MDG+ Initiative is coordinated by ESCWA in partnership with the Arab Countries Water Utilities Association (ACWUA) and the League of Arab States under the auspices of the Arab Ministerial Water Council, which receives regular reports twice a year regarding progress the achieved.

The institutional framework includes an Advisory Board, an MDG+ Unit and National Monitoring Teams, who are led by National Focal Points. The MDG+ Initiative Advisory Board is comprised

of representatives from the League of Arab States, ESCWA, ACWUA, Arab Water Council, Arab Network for Environment and Development (RAED), and the Center for Environment and Development of the Arab Region and Europe (CEDARE). The Advisory Board supports the implementation and dissemination of the information and findings generated by the MDG+ Initiative. The Board also discusses strategic approaches for examining and raising awareness about the findings and lessons learned from the initiative.

An MDG+ Unit was established at the ACWUA secretariat in Amman, Jordan to support the implementation of the initiative. The unit is responsible for coordinating with national and regional counterparts, providing technical assistance and guidance to national monitoring teams, supporting data collection efforts and developing a regional knowledge management system. The unit is also responsible for publishing the regular reports of the MDG+ Initiative.

The National Focal Points (NFPs) and National Monitoring Teams are officially nominated by Arab States to coordinate and follow-up on the collection of data on the MDG+ indicators at the national level. The NFP serves as the chairperson of the National Monitoring Team and is a designated representative of the ministry that serves on the Arab Ministerial Water Council. The Vice-Chairperson of the team is the designated by the ACWUA Board of Directors member for that country. Representatives from the national statistical office and associated bodies also serve on the National Monitoring Team.

III. The Water-related SDGs

The SDGs seek to overcome a wide range of sustainable development challenges. The seventeen SDGs are elaborated through 169 targets. Accordingly, water is not only embedded in the SDG-6 targets, but also in targets related to a number of other priority challenges, such as those focused on poverty (SDG-1), health (SDG-3), education (SDG-4), human settlements (SDG-11), sustainable consumption and production (SDG-12), climate change (SDG-13), oceans, seas and marine resources (SDG-14) and ecosystems (SDG-15). Section A below examines the SDG-6 targets, while water as a cross-cutting throughout the SDGs is addressed in Section B.

A. The Proposed SDG-6 Indicators and Data Sources

The SDG-6 targets are presented in table 5 (United Nations, 2015) and the latest set of SDG-6 indicators proposed by IAEG-SDGs are presented in table 6 (UNSTATS, 2016a). The lead international agencies put forth for monitoring the SDG-6 targets under the UN-Water GEMI Monitoring Framework, and their stages of development are presented in table 6 (UNSTATS, 2015; 2016b).

Table 5. The SDG-6 targets

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

Table 6. Latest set of indicators proposed by the IAEG-SDGs

Indicator	Lead agencies	Indicator title	Status	Tier
6.1.1	WHO & UNICEF	Proportion of population using safely managed drinking water services	🟢	II
6.2.1	WHO & UNICEF	Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	🟢	II
6.3.1	WHO & UN-Habitat	Proportion of wastewater safely treated	🟢	III
6.3.2	UNEP	Proportion of bodies of water with good ambient water quality	🟢	II
6.4.1	FAO	Change in water-use efficiency over time	🟢	I
6.4.2	FAO	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	🟢	I
6.5.1	UNEP	Degree of integrated water resources management implementation (0-100)	🟢	I
6.5.2	UNECE & UNESCO & UNEP	Proportion of transboundary basin area with an operational arrangement for water cooperation	🟢	II
6.6.1	UNEP	Change in the extent of water-related ecosystems over time	🟢	II
6.a.1	OECD & WHO & UNEP	Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan	🟢	II
6.b.1	WHO & UNEP	Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	🟢	II

🟢 Indicators for which there is general agreement; I A first tier for which a methodology has been developed and data are already widely available; II A second tier for which a methodology has been developed but data are not easily available; III A third tier for which a methodology has not yet been developed.

Additional information on these indicators and data sources is elaborated in the sections below, in light of informing discussion on their appropriateness for application in the Arab region.

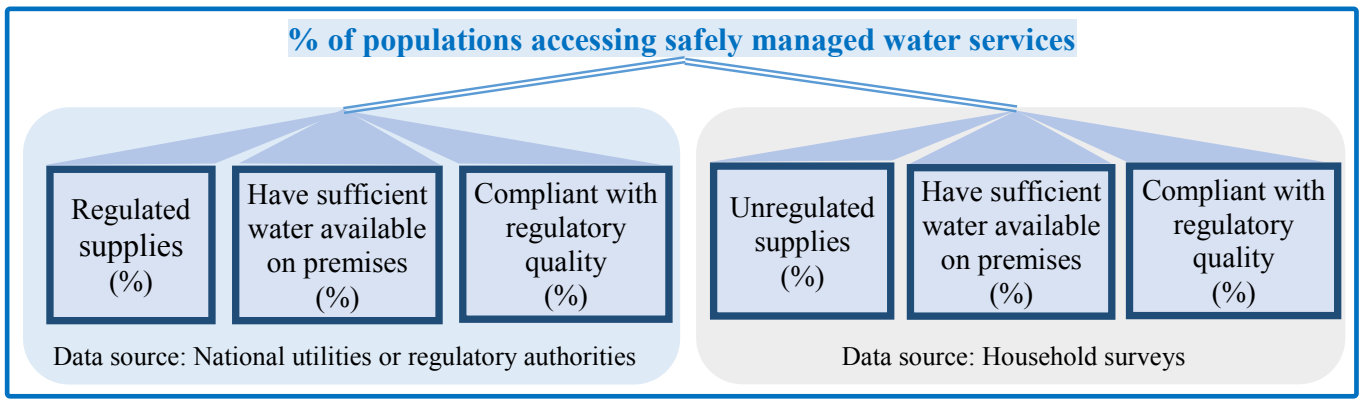
1. *Indicator SDG-6.1.1*

According to the WHO & UNICEF's methodological note issued within the framework of the SDG preparations (WHO & UNICEF, 2015), the proposed indicator of "*Proportion of population using safely managed drinking water services*" is comprised of the following four sub-indicators:

a) A basic drinking water source (MDG improved indicator),
b) which is located on premises,
c) available when needed, and
d) compliant with fecal and priority chemical guidelines.

Figure 6 presents an illustration of the proposed method. Details of the proposed method of calculation of this indicator could found in the JMP (WHO & UNICEF, 2015).

Figure 6. Illustration of the proposed method of calculation of indicator SDG-6.1.1



Data sources:
The proposed method of calculation of indicator SDG-6.1.1 is based on data provided by the national regulatory authorities for regulated water supply sources and data resulted from household surveys for unregulated water supply sources.

A sustained follow-up and coordination effort is required to implement a data collection mechanism to obtain reliable and regular data records from the range of authorities that are responsible for monitoring these aforementioned components included in the composition of SDG-6.1.1. A global monitoring and reporting mechanism will thus need to rely on household surveys and country-level coordination to collect the data needed to calculate this indicator.

Appropriateness for application in the Arab region:
Although the indicator is appropriate for application in the Arab region, the access to the water supply sources does not imply that the served population has access to sufficient water quantity. Therefore, in addition to the water accessibility, availability and quality aspects included in the proposed indicator, the inclusion of the average consumed water quantity per person per day will inform better the water service delivery in the Arab region.

2. *Indicator SDG-6.2.1*

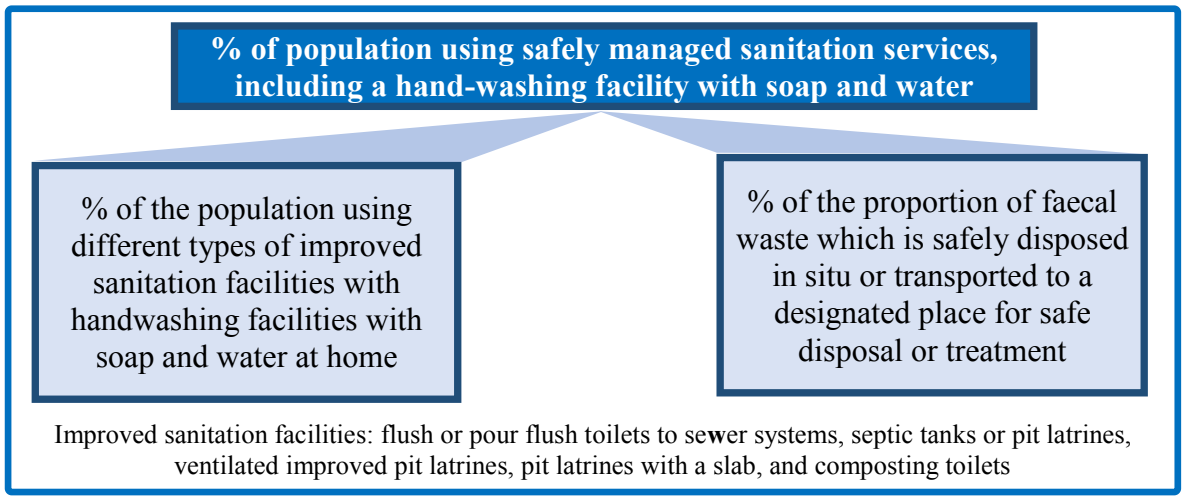
The proposed indicator of "*Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water*" comprises the following four main sub-indicators:

a) A basic sanitation facility (MDG improved indicator, i.e. flush or pour flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with a slab, and composting toilets),
b) which includes hand-washing facility with soap and water,

c) which is not shared, and
d) where excreta are safely disposed in situ or transported and treated off-site.

The percentage of the population using safely managed sanitation services can be calculated by combining data on the proportion of the population using different types of improved sanitation facilities with estimates of the proportion of faecal waste which is safely disposed in situ or transported to a designated place for safe disposal or treatment (WHO & UNICEF, 2015). Figure 7 presents an illustration of the proposed method.

Figure 7. Proposed method for calculating indicator SDG-6.2.1



Data sources:
The proposed method of calculation of indicator SDG-6.2.1 is based on data provided by the national regulatory authorities (utilities), household surveys and simulation methods.

JMP proposes in the absence of country data from service providers or regulators to use an approximated method to evaluate the percentage of the proportion of fecal waste which is safely disposed on-site or transported to a designated place for safe disposal or treatment based on the types of toilets people use, and the country they are used in, approximate safety factors could be attributed based on actual country situations. Based on the types of sanitation facilities people use, and the particular condition of the country they are used in, safety factors could be set to a specific country. Details of the proposed method of calculation of this indicator can found in WHO & UNICEF (2015).

It is important to mention that household surveys and censuses provide data on the uses of types of improved sanitation facilities. However, they fail to provide data on wastewater which is safely disposed in situ or transported to a designated place for safe disposal or treatment.

Appropriateness for application in the Arab region:
Although this indicator is appropriate for application in the Arab region, the method of evaluation of the safely treated wastewater should be tailored to be consistent with data sources. Two different methods of evaluation of the safely treated wastewater should be used based on the sources of data (service providers or household surveys) (Karnib, 2016).

3. *Indicator SDG-6.3.1*

The proposed indicator of "*Proportion of wastewater safely treated*" is defined as the proportion of wastewater produced by households and by economic activities which is safely treated compared to total wastewater produced. The calculation of the indicator value is the amount of treated wastewater generated from: a) sewerage systems, b) on-site sanitation facilities and c) industries, divided by the total amount of wastewater produced. Details of the proposed method of calculation of this indicator could found in UNSTATS (2016b).

Data sources:
The proposed method of calculation of indicator SDG-6.3.1 is based on data provided by the national regulatory authorities (utilities), household surveys, simulation methods and data generated from the System of National Accounts (SNA).

Appropriateness for application in the Arab region:
Same comment as mentioned above for the 6.2.1 indicator.

4. *Indicator SDG-6.3.2*

The "*Proportion of bodies of water with good ambient water quality*" can be calculated using the GEMS/WATER water quality index approach. Details of the proposed method of calculation of this indicator could be found in UNSTATS (2016b).

Data sources:
Data are available from UNEP's GEMS/WATER and OECD. Additional information on water properties from remote sensing can be used as proxies for sediments and eutrophication/nutrient loading. For data-poor areas estimates can be generated using existing in situ data combined with modelled data and remote sensing information (UNSTATS, 2016b).

Appropriateness for application in the Arab region:
This indicator is appropriate for application in the Arab region.

5. *Indicator SDG-6.4.1*

The "*Change in water-use efficiency over time*" is disaggregated by irrigated agriculture, industries, energy and municipal water supply sectors. It is calculated as the output over time of the above mentioned sectors per volume of (net) water withdrawn. Details of the proposed method of calculation related to this indicator could found in UNSTATS (2016b).

Data sources:
The proposed method of calculation of indicator SDG-6.4.1 is based on data available in numerous international water data bases (FAO, National Accounts Main Aggregates (UNSD), International Energy Agency, UN Population Division demographic datasets, World Bank, and other data bases sources) (UNSTATS, 2016b).

Appropriateness for application in the Arab region:
The indicator could not be calculated for all Arab countries immediately. Efforts should be exerted to fill in existing data gaps and to develop capacity in data collection in several Arab countries.

6. *Indicator SDG-6.4.2*

The "*Level of water stress: freshwater withdrawal as a proportion of available freshwater resources*" is the ratio between total freshwater withdrawn by all major sectors and total renewable freshwater resources, after having taken into account environmental water requirements. The indicator builds on MDG indicator 7.5 and also accounts for environmental water requirements.

Data sources:
Data for this indicator will be collected by national ministries and institutions having water-related issues in their mandate, such as ministries of water resources, agriculture, or environment. Data are mainly published within national water resources and irrigation master plans, national statistical yearbooks and other reports (such as those from projects, international surveys or results and publications from national and international research centres) (UNSTATS, 2016b).

Appropriateness for application in the Arab region:
This indicator measures the unsustainable use of water resources as a ratio of water withdrawn to water availability. However, this indicator fails to provide clear picture in extreme water resources use and availability conditions. In fact, in regions that are well-endowed with water resources, this indicator may show positive trends over time, regardless of the efforts being exerted on water resources management. However, in water-scarce regions such as the Arab region, progress will appear limited or negative, despite significant efforts being made to improve water resources management locally.

7. *Indicator SDG-6.5.1*

The "*Degree of integrated water resources management implementation (0-100)*" is calculated based on national surveys that are structured in 4 components: policies, institutions, management tools, and financing. Within each component there are questions with defined response options giving scores of 0-100. Questions scores are aggregated to the component level, and each component score is equally weighted to give an aggregated indicator score of 0-100. Details of the proposed method of calculation related to this indicator could found in UNSTATS (2016b).

Data sources:
UNEP as part of the UN-Water monitoring framework GEMI will coordinate the UN-Water support to countries to collect the data for this indicator (UNSTATS, 2016b).

Appropriateness for application in the Arab region:
The surveys questions and their related defined response options should be discussed to ensure relevance for application in the Arab region.

8. *Indicator SDG-6.5.2*

The "*Proportion of transboundary basin area with an operational arrangement for water cooperation*" is calculated, for any spatial unit (country, region), as the percentage that the total surface area (in km^2) of transboundary basins that have an operational arrangement for water cooperation makes up of the total surface area of transboundary basins (km^2).

Data sources:
Spatial data are available at global level for known surface water basins and transboundary aquifers, but may be contested by member States.

Appropriateness for application in the Arab region:
The indicator could not be calculated for all Arab countries immediately. Efforts would be needed to agree on basin delineations and fill in data gaps related to transboundary groundwater resources in several Arab countries.

9. *Indicator SDG-6.6.1*

The "*Change in the extent of water-related ecosystems over time*" is proposed to estimate percentage change in each major ecosystem present in a country, and the indicator will enable countries to report on those water-related ecosystems that are important to them. The structure of the indicator can be designed to align with the SEEA Water accounts and estimate percentage change in natural water capital available to society based on a) mean annual water availability; b) mean annual water withdrawals; c) environmental water requirements. Details of the proposed method of calculation related to this indicator could found in UNSTATS (2016b).

Data sources:
UNEP as part of the UN-Water monitoring framework GEMI will coordinate the UN-Water support to countries to collect the data for this target (UNSTATS, 2016b).

Appropriateness for application in the Arab region:
The indicator could not be calculated for all Arab countries immediately. Existing data gaps and disagreement on delineation of aquifer systems; capacity building in data collection based on common methodologies in several Arab countries still needs to be developed.

10. *Indicator SDG-6.a.1*

The "*Amount of water and sanitation related official development assistance that is part of a government-coordinated spending plan*" is proposed to be computed as the proportion of the amount of water and sanitation related official development assistance received by a government to the total amount budgeted (for water and sanitation) in a government coordinated spending plan (UNSTATS, 2016b).

Data sources:
The main data sources are UN-Water Global Analysis and Assessment of Sanitation and Drinking Water (GLAAS) surveys.

Appropriateness for application in the Arab region:
This indicator may not suitable for developing Arab countries with high GDP per capita levels that do not receive overseas development assistance directly from international donors. Other indicators may thus be considered or consolidated to reflect a more appropriate indicator for the region, such as share of GDP allocated for water and sanitation related investments or foreign direct investment in water-related sectors, including potentially the desalination and energy sectors.

11. *Indicator SDG-6.b.1*

The "*Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management*". This indicator builds on data that are already regularly collected by UN-Water GLAAS on the presence, at the national level, of clearly defined procedures in laws or policies for participation by service users. This indicator will also build on the data collected for the Status of Integrated Water Resources Management (IWRM) reporting in SDG target 6.5, in particular on the presence of formal stakeholder structures established at sub-catchment level (UNSTATS, 2016b).

Data sources:
The main data sources are the UN-Water GLAAS surveys and the IWRM surveys for SDG targets 6.1, 6.2 and 6.5.

Appropriateness for application in the Arab region:
The indicator may be appropriate for application in the Arab region, noting that indicator assumes decentralization of decision-making to local administrative districts on water and sanitation issues, which is not the case in all Arab States.

B. Gaps in the Global Indicators Framework for Achieving SDG-6 Targets

As it is noticeable from the introduction of SDG-6 indicators in Section A above, the indicators put forth at the global level do not cover the full scope of issues included in the SDG-6 targets. Table 7 reviews the targets which are insufficiently covered by the proposed SDG-6 indicators.

Table 7. SDG-6 targets that are not adequately covered by global indicators

Target Number	Issues addressed in target	Issues not covered by the proposed global indicators
6.1	Equitable accessibility - Safe - Affordable	Affordability
6.2	Adequate and equitable accessibility - Hygiene - End open defecation - Needs of women and girls and those in vulnerable situations	End open defecation - Needs of women and girls and those in vulnerable situations
6.3	Water quality - Treated wastewater - Recycling - Safe reuse	Recycling - Safe reuse
6.4	Water-use efficiency - Sustainable withdrawals and supply of freshwater - Water scarcity - People suffering from water scarcity	Water scarcity - People suffering from water scarcity
6.5	IWRM - Transboundary basin cooperation	Assumes agreement on basin delineations
6.6	Water-related ecosystems	Assumes agreement on extent of water-related ecosystems, including aquifers
6.a	International cooperation - Capacity-building	Assumes ODA inflows
6.b	Participation of local communities	Assumes decentralized governance structures

Table 7 shows that no SDG indicators are proposed to evaluate the "*recycling and safe reuse*" mentioned in the SDG-6.3. However, the safe reuse of treated wastewater can reduce environmental risks by reducing wastewater discharge into the environment, and they can also increase agricultural production in regions where water resources are extremely limited such as the Arab region. Moreover, although the Arab region is characterized by water scarcity, the SDG target 6.4 statements to address water scarcity and substantially reduce the number of people suffering from water scarcity are not covered by any proposed metric. There is also concern regarding proposed global indicators being put forth to measure progress in improved management of transboundary water basins and water-related ecosystems, as the current global target under discussion first requires agreement among riparian states regarding the delineation of such basins or ecosystems, particularly as aquifer systems are defined as ecosystems in SDG target 6.6.

C. Water Across the SDGs

Although the water sector is addressed as a stand-alone goal in the SDGs, water is evident as a cross-sectoral issue that affects the achievement of almost all the SDGs. More specifically, many of the proposed SDGs water related indicators may be used across various goals and can monitor and report on more than one target. Table 8 presents the explicit water cross-cutting in the SDGs.

Table 8. Water cross-cutting in the SDGs: Explicit

Theme	SDG	Target	Target statement	Link to cross-cutting
Poverty	SDG-1	1.4	By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, **as well as access to basic services**, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.	Includes access to safe drinking water and sanitation services
Health	SDG-3	3.3	By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, **water-borne diseases** and other communicable diseases.	Includes water quality concerns in drinking water, surface waters and groundwater
Health	SDG-3	3.9	By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, **water and soil pollution** and contamination.	Includes wastewater treatment, wastewater discharge into water bodies and water quality
Education	SDG-4	4.a	Build and upgrade **education facilities that are child, disability and gender sensitive** and provide safe, non-violent, inclusive and effective learning environments for all	Includes access to safe drinking water and sanitation
Human Settlements	SDG-11	11.1	By 2030, ensure access for all to adequate, safe and affordable housing and **basic services** and upgrade slums	Includes access to safe drinking water and sanitation; and possibly wastewater treatment

Table 8. Water cross-cutting in the SDGs: Explicit (continued)

Theme	SDG	Target	Target statement	Link to cross-cutting
Human Settlements	SDG-11	11.6	By 2030, reduce the adverse per capita **environmental impact of cities**, including by paying special attention to air quality and **municipal and other waste management**	Includes wastewater treatment, wastewater discharge into water bodies and water quality
Human Settlements	SDG-11	11.7	By 2030, provide universal access to safe, inclusive and accessible, **green and public spaces**, in particular for women and children, older persons and persons with disabilities	Includes freshwater in ecosystem
Sustainable Consumption and Production	SDG-12	12.2	By 2030, achieve the sustainable management and **efficient use of natural resources**	Includes water use efficiency
Sustainable Consumption and Production	SDG-12	12.4	By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and **significantly reduce their release to air, water and soil** in order to minimize their adverse impacts on human health and the environment	Includes wastewater treatment, wastewater discharge into water bodies and water quality
Oceans, Seas and Marine Resources	SDG-14	14.1	By 2025, prevent and significantly reduce **marine pollution** of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	Includes wastewater treatment and wastewater discharge into costal and saltwater systems
Ecosystems	SDG-15	15.1	By 2020, ensure the conservation, restoration and **sustainable use of terrestrial and inland freshwater ecosystems and their services**, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	Includes freshwater in ecosystem based management efforts

The list above identifies SDGs with targets that explicitly measure water-related issues. Other SDGs and targets are implicitly water dependent, particularly in water stressed regions, are detailed in table 9 below. This exposes the cross-cutting nature of water within the SDGs and the need to consider the achievement of these goals and targets from a nexus perspective that recognizes the inter-dependencies across the SDGs. Such a nexus approach needs to be reconciled, however, with the proposed set of indicators that are being defined at the global level, which may not necessarily led themselves well to linking at the intersections that will influence the achievement of the SDGs. A regional perspective that considers nexus dimensions within the context of regional specificities may thus present a more appropriate means of considering how to identify the priority water issues to consider within an integrated, cross-sectoral approach to the SDGs.

Table 9. Water cross-cutting in the SDGs: Implicit

Theme	SDG	Nexus
Hunger	SDG-2	Includes water use efficiency in agriculture
Gender Equality	SDG-5	Includes the access of women to safe drinking water and sanitation
Energy	SDG-7	Includes water use efficiency in energy production
Economic Growth	SDG-8	Good ambient water quality decouple economic growth from environmental degradation
Industry, Innovation and Infrastructure	SDG-9	Includes water use efficiency for infrastructure and industry
Inequalities	SDG-10	Includes the access of women and girls and those in vulnerable situations to safe drinking water and sanitation
Climate Change	SDG-13	Climate change adaptation is all about water in vulnerable and water-stressed regions

A second important tool for tracking cross-cutting issues is disaggregation. The monitoring of the indicators should be disaggregated as much as possible so that SDGs outcomes can be tracked with a high degree of accuracy and consideration of vulnerable groups. Achieving gender equality, for example, will require many water related indicators to be disaggregated by sex, such as those on access to safely managed water and sanitation services. Access to water and sanitation services in informal settlements and refugee camps may also need more specialized indicators that can more appropriately measure progress towards the global target and goal. It is not certain that the metadata being formulated to support the global indicator framework will be able to adequately reflect these aspects in an inclusive and comprehensive manner with respect to the stated goals and targets.

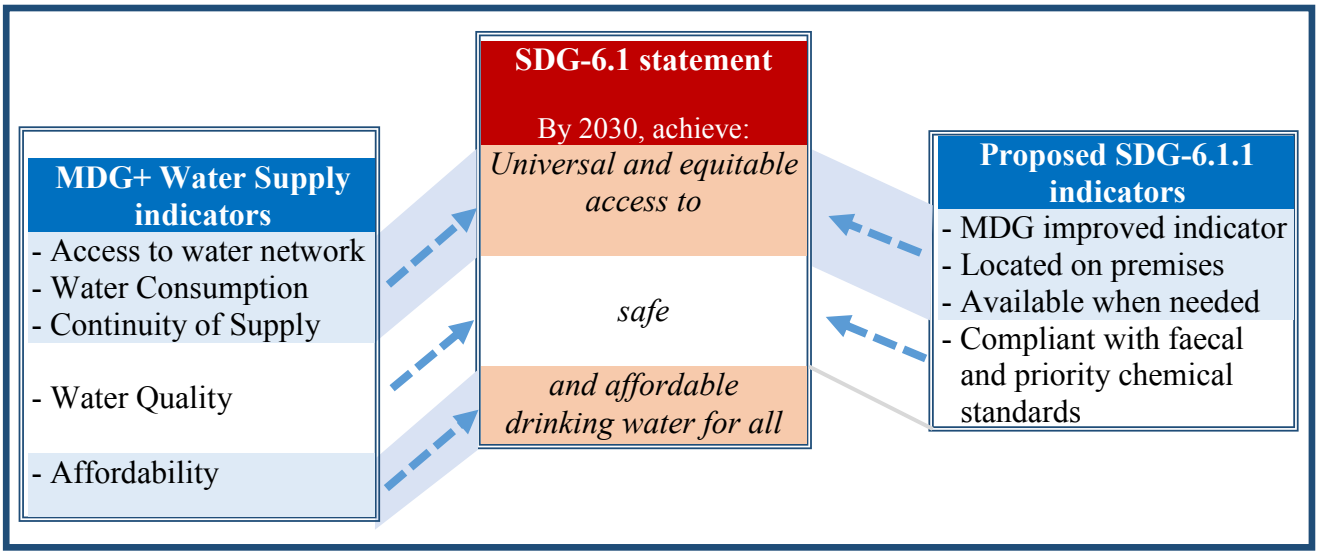
IV. Linkages between the MDG+ Indicators and Water-related SDGs

The MDG+ Initiative indicators and monitoring framework being developed has the potential to support the regional follow-up on the water-related SDGs, and specifically those related to water supply, sanitation and wastewater treatment and reuse. The potential interconnection between MDG+ indicators and the water-related SDGs will be examined in the following sections.

A. MDG+ Initiative Indicators and SDG-6.1

The MDG+ indicator framework could contribute to regional follow-up on the water SDG-6.1 at the piped water supply system level. Figure 8 illustrates the interconnections between MDG+ indicators, the SDG-6.1 and the proposed SDG-6.1.1.

Figure 8. Interconnections between MDG+ Initiative indicators and the SDG-6.1

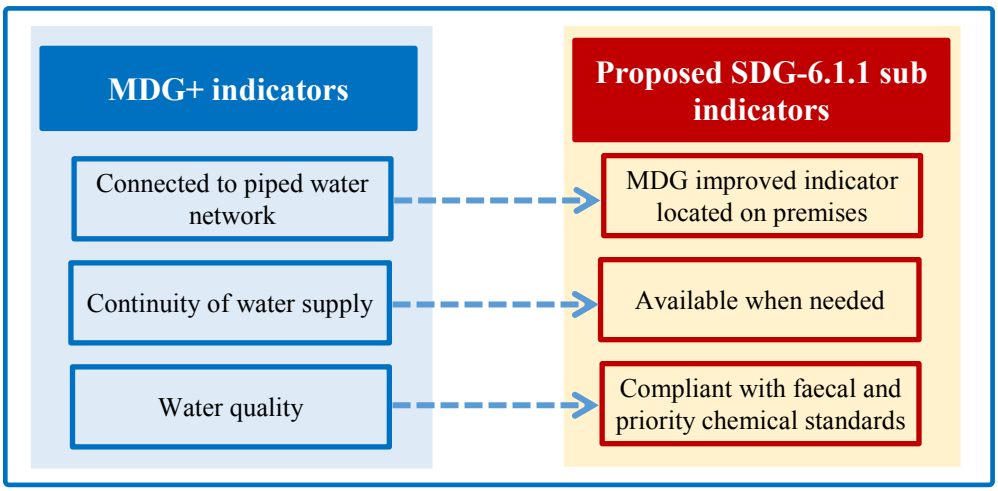


The access to water network, water consumption and continuity of supply MDG+ indicators could evaluate the "*Universal and equitable access*" purpose stated in target 6.1, additionally, water quality and affordability MDG+ indicators could evaluate the "*safe*" and "*affordable*" statements mentioned in target 6.1.

On the other hand, the proposed SDG-6.1.1 indicator could evaluate the "*Universal and equitable access*" and "*safe*" statements mentioned in target 6.1, however, even though the affordability is stated in target 6.1 wording, it is not covered by the indicator SDG-6.1.1.

If the proposed SDG-6.1.1 indicator will be adopted to evaluate target 6.1, figure 9 presents the potential use of the MDG+ indicator framework in the evaluation of this indicator at the piped water supply system level.

Figure 9. Potential use of the MDG+ Initiative indicators to measure the indicator SDG-6.1.1



The connected to piped water network, continuity of water supply and water quality MDG+ Initiative indicators will be used as proxy to the MDG improved indicator located on premises, available when needed and compliant with faecal and priority chemical standards sub-indicators of SDG-6.1.1 respectively.

In the following paragraphs a method of evaluation of the indicator SDG-6.1.1 based on MDG+ Initiative indicators will be proposed and discussed.

Proposed method of calculation of the indicator SDG-6.1.1 based on MDG+ Initiative indicators

If we denote by:

SMW (%): Proportion of population using safely managed drinking water services
CPW (%): Population connected to a piped water network as percentage of the total population.
DWS (%): Proportion of population receiving their water daily, 3-4 days a week or once a week.

It is important to mention that households are generally equipped with in-house water storage facilities. The availability of water based on 3-4 days a week or once a week continuity of water supply depends on the volume of the in-house water storage facilities. The water availability mentioned in the SDG-6.1.1 indicator should be evaluated based on the continuity of water supply indicator jointly with the storage capacity of the in-house water storage facilities generally used in each country.

TWS (%): Proportion of population supplied with treated (disinfected) water.

The percentage of population using safely managed drinking water services could be calculated by the following equation:

$$SMW = CPW*DWS*TWS \qquad (3)$$

Evaluation scenario of the indicator SDG-6.1.1 based on MDG+ Initiative indicators

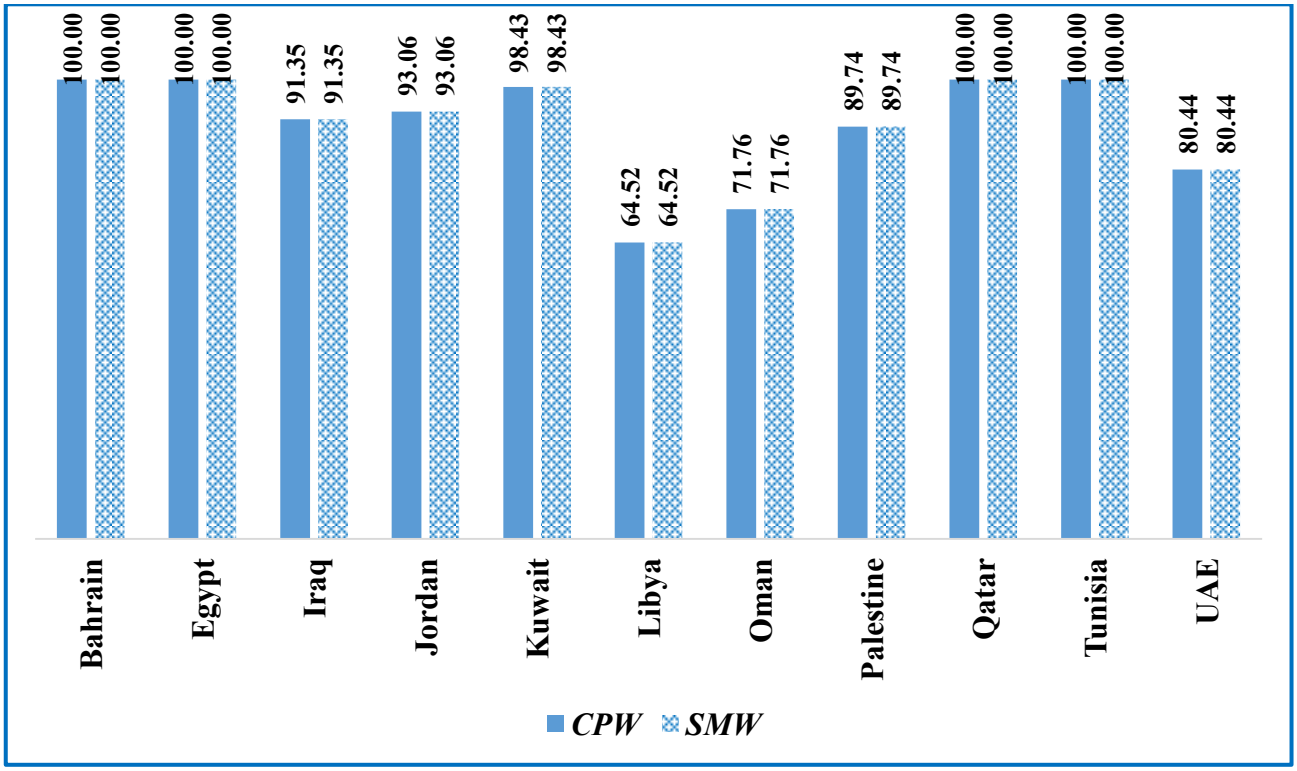
In order to examine the proposed method on practical level, this section describes an application of the proposed methodology to evaluate the indicator SDG-6.1.1 based on the results of MDG+ indicators published in the first MDG+ report (2015) (LAS, ESCWA, ACWUA, 2015).

It is important to mention that the presented application is only for piped water supply systems in urban areas, the evaluation of the MDG+ indicators for the on-site improved water supply sources is discussed in section V of this paper.

The *SMW* (%) indicator is calculated in urban areas for 11 Arab countries based on the results of MDG+ indicators published in the first MDG+ report (2015) using the equation (3) and the results are illustrated in figure 10.

NB: *It is assumed that the in-house water storage facilities in Jordan and Palestine are considered to be sufficient to secure water availability for a period of one week. Therefore, water supplied once a week jointly with the storage capacity of the in-house water storage facilities in these two countries is considered available when it is needed.*

Figure 10. Resulted SMW (%) and CPW (%) in urban areas



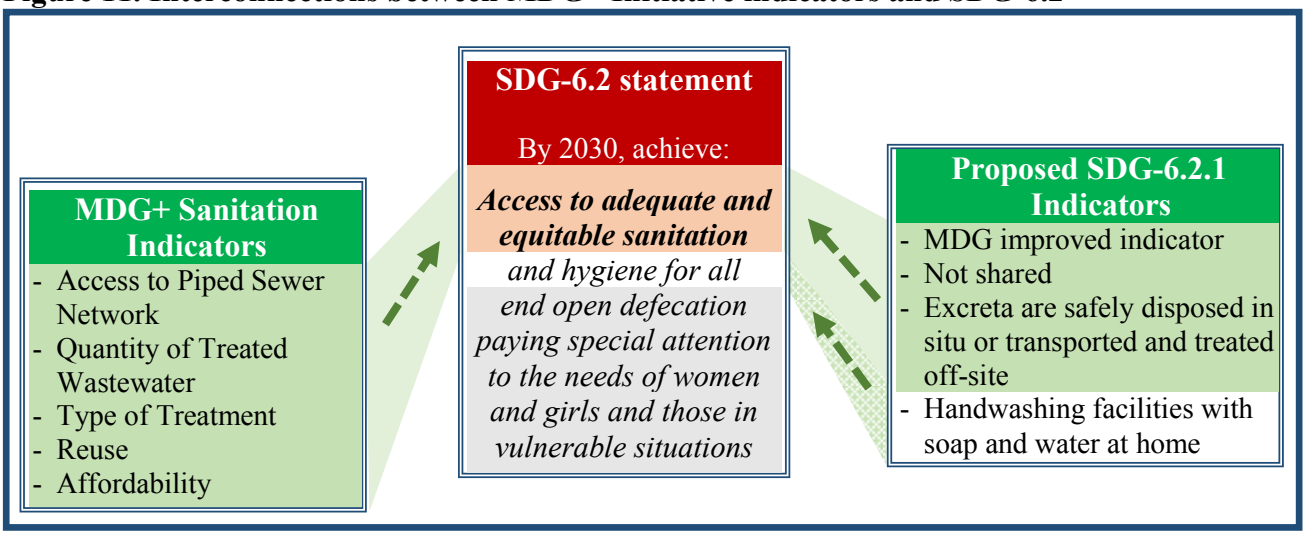
Source: compiled by the author based on the results of MDG+ indicators published in the first MDG+ report (2015)

Figure 10 shows that all the population connected to piped water supply network in 11 Arab countries are using safely managed drinking water services pursuant to the IAEG-SDGs proposal of safely managed drinking water services. This scenario demonstrates that the MDG+ indicators evaluated at the piped water supply system level based on water utilities data records may be used to evaluate the SDG-6.1.1 indicator.

B. MDG+ Initiative Indicators and SDG-6.2

The developed MDG+ indicator framework (which includes evaluation of indicators at the sewerage systems level) could contribute to regional follow-up on the water SDG-6.2 at the sewerage system level. Figure 11 illustrates the interconnections between MDG+ indicators and the SDG-6.2 and the corresponding proposed indicators.

Figure 11. Interconnections between MDG+ Initiative indicators and SDG-6.2

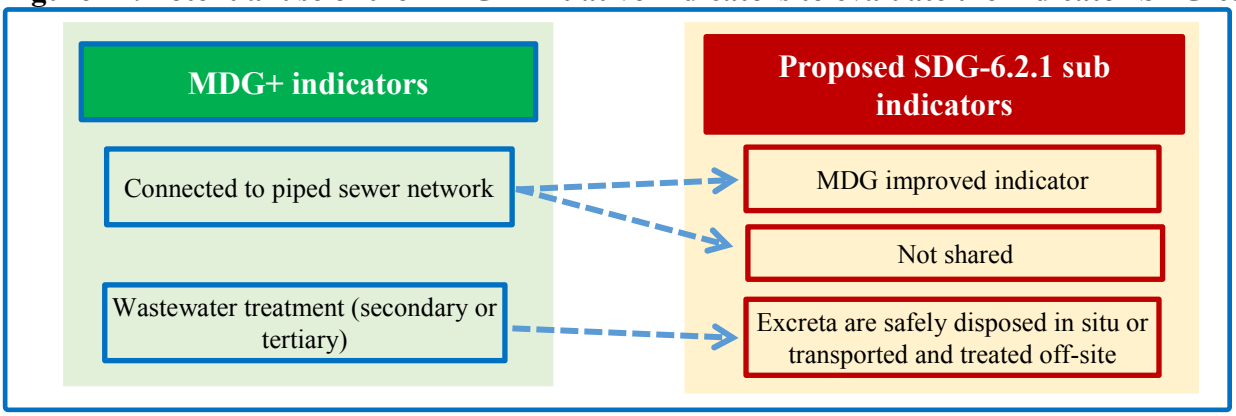


The access to piped sewer network, quantity of treated wastewater, type of treatment and reuse indicators could evaluate the "*Access to adequate and equitable sanitation*" purpose stated in target 6.2.

On the other hand, the proposed SDG-6.2.1 indicator (*Percentage of population using safely managed sanitation services, including a hand-washing facility with soap and water*) evaluates the "*Access to adequate and equitable sanitation*" and "*hygiene for all*" purposes stated in target 6.2.

The "*end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations*" aim stated in target 6.2 is not covered by the MDG+ indicator framework nor by indicator SDG-6.2.1.

Figure 12. Potential use of the MDG+ Initiative indicators to evaluate the indicator SDG-6.2.1



If the proposed SDG-6.2.1 indicator will be adopted globally to evaluate target 6.2, figure 12 presents the potential use of the actual MDG+ indicator framework in the evaluation of this indicator at the sewerage systems level.

The connected to piped sewer network MDG+ Initiative indicator will be used as proxy to the MDG improved and not shared sub-indicators of SDG-6.2.1. Moreover, the wastewater treatment (secondary or tertiary) MDG+ indicators will be used as proxy to the excreta are safely disposed in situ or transported and treated off-site sub-indicator of SDG-6.2.1.

It is important to mention that the proposed SDG-6.2.1 indicator includes wastewater treatment as required service in order to consider the sanitation facilities as safely managed. However, in scarce water regions such as the Arab region, wastewater reuse is an important factor for the effective wastewater management (Karnib, 2014), therefore, the evaluation framework of the percentage of population using safely managed sanitation services in the Arab region should integrate the wastewater reuse in addition to the wastewater treatment. Karnib (2014) presents in detail a methodological approach to evaluate such indicator.

In the following paragraphs a method of evaluation of the indicator SDG-6.2.1 based on MDG+ indicators will be proposed and discussed.

Proposed method of calculation of the indicator SDG-6.2.1 based on MDG+ Initiative indicators

If we denote by:

SMS (%): Proportion of population using safely managed sanitation services.
CPS (%): Proportion of population connected to a piped sewer network.
WWT (%): Proportion of the annually collected wastewater by piped sewer networks that have undergone secondary or tertiary treatment.

The percentage of population using safely managed sanitation services could be calculated by the following equation:

$$SMS = CPS * WWT \qquad (4)$$

Evaluation scenario of the indicator SDG-6.2.1 based on MDG+ Initiative indicators

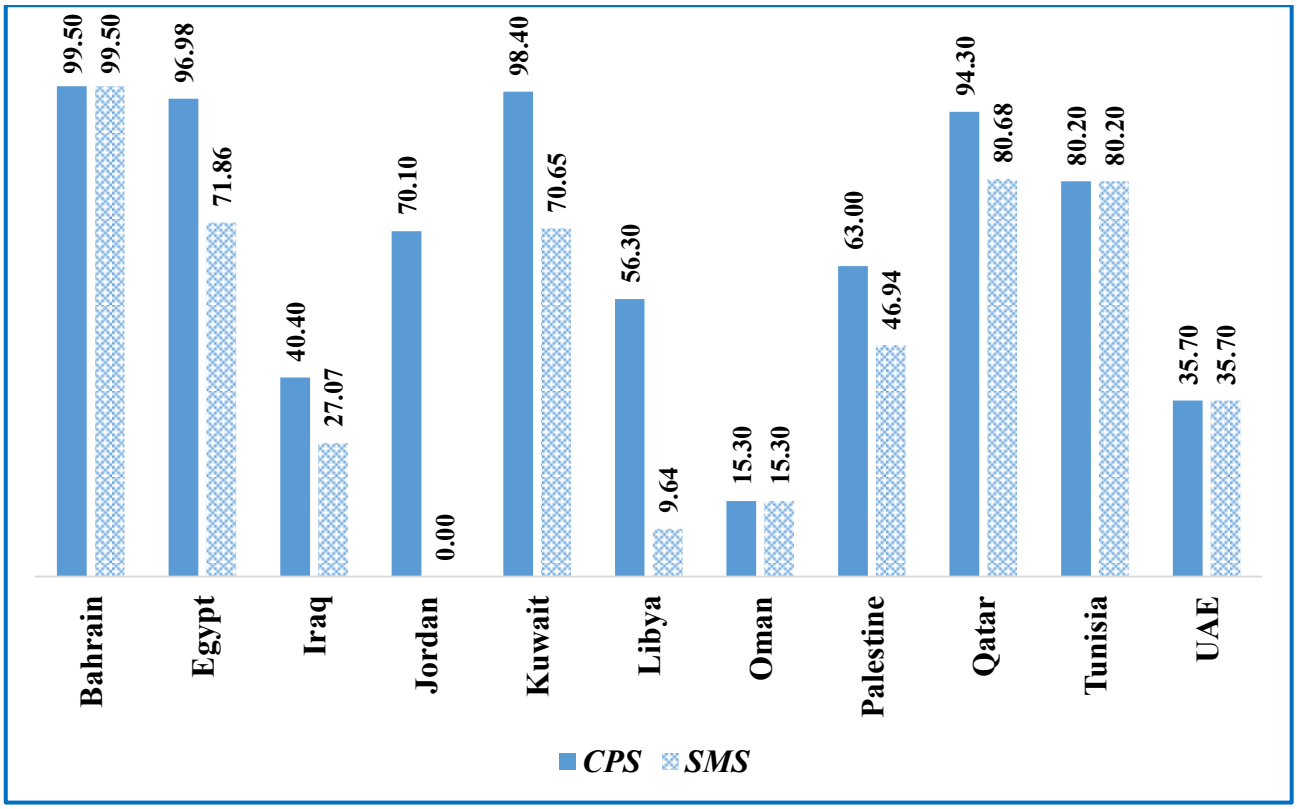
In order to put the proposed method on practical level, this section describes an application of the proposed methodology to evaluate the indicator SDG-6.2.1 based on the results of MDG+ indicators published in the first MDG+ report (2015).

It is important to mention that the presented application is only for sewerage systems in urban areas, the evaluation of the MDG+ indicators for the on-site improved sanitation systems is discussed in section V of this paper.

The *SMS* (%) indicator is calculated in urban areas for 11 Arab countries based on the results of MDG+ indicators published in the first MDG+ report (2015) using the equation (4) and the results are illustrated in figure 13.

The proportion of population connected to piped sewer network in MDG+ indicator framework is calculated based on the number of connected households, therefore, the reported proportion are not using shared toilets.

Figure 13. Resulted SMS (%) and CPS (%) in urban areas



Source: compiled by the author based on the results of MDG+ indicators published in the first MDG+ report (2015)

Although the proportion of population connected to piped wastewater network is 96.98% in urban areas in Egypt, the proportion of population connected to safely managed wastewater collection systems measures 71.9% only. This is due the low rate of the proportion of the safely treated wastewater. The proportion of population connected to safely managed wastewater collection systems in Jordan equal to 0, this is in view of the fact that all the collected wastewater are primary treated which represent a high risk to the environmental. The scenario shown in figure 13 demonstrates that the MDG+ indicators evaluated at the sewerage system level based on water utilities data records may be used to evaluate the SDG-6.2.1 indicator.

C. MDG+ Initiative Indicators and SDG-6.3

The developed MDG+ Initiative indicator framework could contribute to regional follow-up on the water SDG-6.3 at the sewerage system level. As we mentioned in section III above, the indicator SDG-6.3.1 (*safely treated wastewater*) is proposed by IAEG-SDGs to evaluate target 6.3. Figure 14 illustrates the interconnections between MDG+ indicators and the SDG-6.3 and the corresponding proposed indicators.

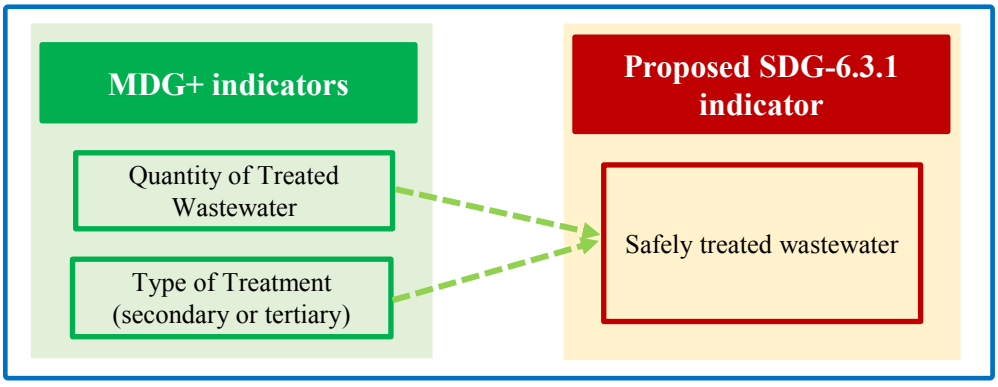
Figure 14. Interconnections between MDG+ Initiative indicators and the SDG-6.3

The quantity of treated wastewater, type of treatment and reuse MDG+ Initiative indicators could evaluate the "*halving the proportion of untreated wastewater*" purpose stated in target 6.3, additionally, the wastewater reuse MDG+ Initiative indicator could evaluate the "*substantially increasing recycling and safe reuse globally*" purpose stated in target 6.3.

On the other hand, the proposed SDG-6.3.1 indicator framework could evaluate the "*halving the proportion of untreated wastewater*" purpose stated in target 6.3, however, even though the recycling and safe reuse is an important purpose stated in target 6.3, there is no indicator proposal to cover this statement.

If the proposed SDG-6.3.1 indicator will be adopted globally to evaluate target 6.2, figure 15 presents the potential use of the MDG+ indicator framework in the evaluation of this indicator at the sewerage system level.

Figure 15. Potential use of the MDG+ Initiative indicators to evaluate the indicator SDG-6.3.1



The quantity of treated wastewater and type of treatment (secondary or tertiary) MDG+ indicators will be used as proxy to the safely treated wastewater indicator.

In the following paragraphs a method of evaluation of the indicator SDG-6.3.1 based on MDG+ Initiative indicators will be proposed and discussed.

Proposed method of calculation of the indicator SDG-6.3.1 based on MDG+ Initiative indicators

If we denote by:

QCW (MCM/year): Volume of collected wastewater by sewerage system per year
QTW (MCM/year): Volume of secondary or tertiary treated wastewater per year

The proportion of safely treated wastewater (*STW*) is calculated by the following equation:

$$STW\,(\%) = \frac{QTW}{QCW} * 100 \qquad (5)$$

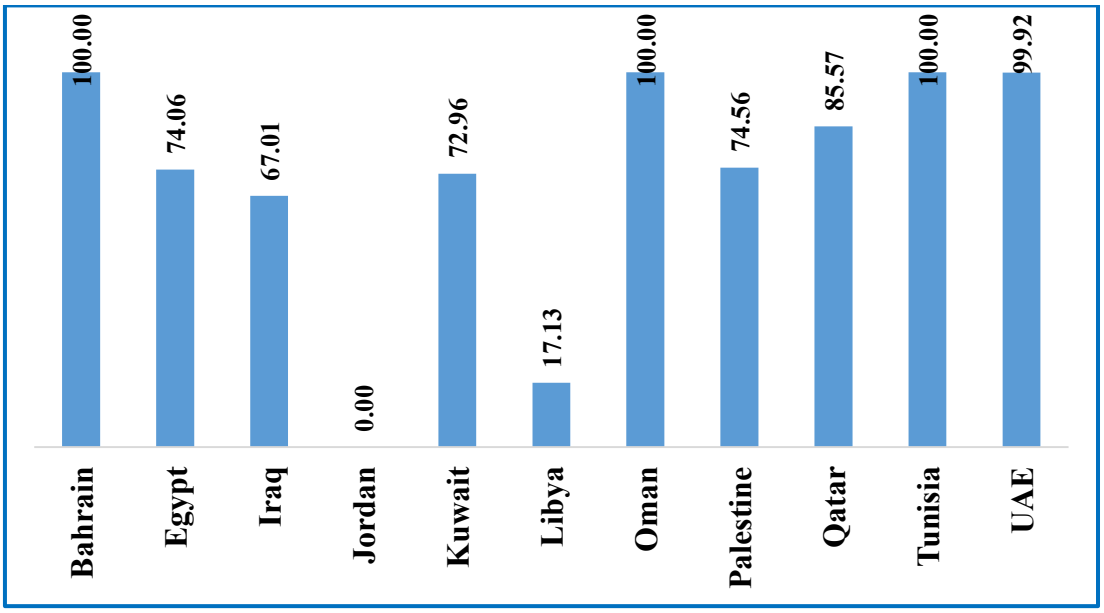
Evaluation scenario of the indicator SDG-6.3.1 based on MDG+ Initiative indicators

In order to examine the proposed method on practical level, this section describes an application of the proposed methodology to evaluate the indicator 6.3.1 based on the results of MDG+ indicators published in the first MDG+ Initiative report (LAS, ESCWA, ACWUA, 2015).

It is important to mention that the presented application is only for sewerage systems, the evaluation of the MDG+ indicators for the other on-site improved sanitation systems is discussed in section V of this paper.

The *STW* (%) indicator is calculated in urban areas for 11 Arab countries based on the results of MDG+ indicators published in the first MDG+ report (2015) using the equation (5) and the results are presented in figure 16.

Figure 16. Resulted *STW* (%) in urban areas



Source: compiled by the author based on the results of MDG+ indicators published in the first MDG+ report (2015)

Figure 16 shows that all the collected wastewater are safely treated in Bahrain, Oman, Tunisia and UAE. In Jordan the rate of the *STW* indicator is 0 because all the collected wastewater are primary treated which represent a pollution risk to the environmental. This scenario demonstrates that the

MDG+ indicators evaluated at the sewerage system level based on water utilities data records may be used to evaluate the indicator SDG-6.3.1.

It is important to mention that no SDG indicators are proposed to evaluate the "*recycling and safe reuse*" mentioned in the SDG-6.3. However, the safe reuse of treated wastewater can reduce environmental risks by reducing wastewater discharge into the environment, and they can also increase agricultural production in regions where water resources are extremely limited such as the Arab region (Karnib 2014).

The reuse purpose stated in target 6.3 could be directly evaluated based on the MDG+ wastewater reuse indicators. This issue will be developed in the next paragraph.

Proposed method of calculation of the "wastewater safely reused" indicator based on MDG+ wastewater reuse indicators

If we denote by:

QCW (MCM/year): Volume of collected wastewater by sewerage system per year
QTR (MCM/year): Volume of secondary or tertiary treated and reused wastewater per year

The proportion of safely reused wastewater (*SRW*) is calculated by the following equation:

$$SRW\,(\%) = \frac{QTR}{QCW} * 100 \qquad (6)$$

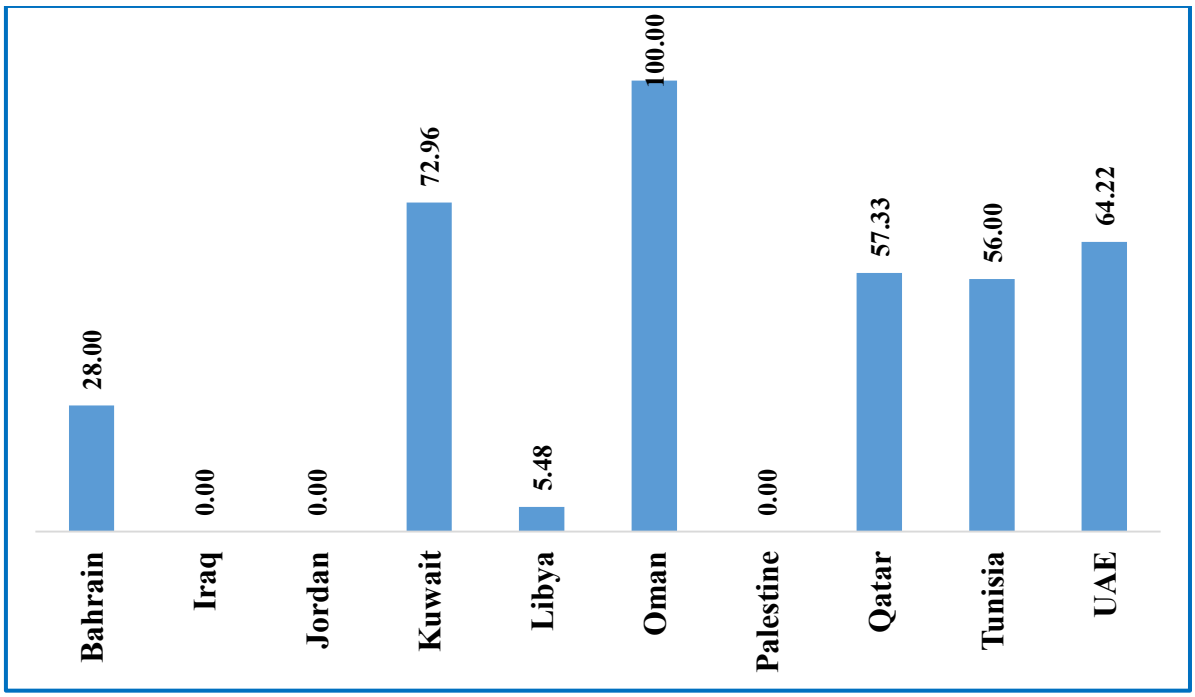
Evaluation scenario of the "wastewater safely reused" indicator based on MDG+ Initiative indicators

In order to examine the proposed approach on practical level, this section describes an application of the proposed methodology to evaluate the "*wastewater safely reused*" indicator based on the results of MDG+ indicators published in the first MDG+ report (2015) (ACWUA & ESCWA 2015).

The *SRW* (%) indicator is calculated in urban areas for 10 Arab countries using the equation (6) and the results are presented in figure 17 (data for Egypt are not available).

Figure 17 shows that Oman has 100% score of the *SRW* because all the collected wastewater are tertiary treated and reused. However, in Iraq, Jordan and Palestine there are no treated and reused wastewater, therefore, the *SRW* results are equal to 0. This scenario demonstrates that the MDG+ indicators evaluated at the sewerage system level based on water utilities data records may be used to evaluate the SDG-6 "wastewater safely reused" indicator.

Figure 17. Resulted *SRW* (%) in urban areas



Source: compiled by the author based on the results of MDG+ indicators published in the first MDG+ report (2015)

D. MDG+ Initiative Indicators and Water across the SDGs

As it was mentioned earlier in this paper (Section III-B), although water is not only embedded in the SDG-6 targets, but also in targets related to a number of other sustainable development goals, such as those focused on poverty (SDG-1), health (SDG-3), education (SDG-4), human settlements (SDG-11), sustainable consumption and production (SDG-12), oceans, seas and marine resources (SDG-14) and ecosystems (SDG-15). This section describes the potential of the MDG+ Initiative indicators to contribute to regional follow-up on the water-related cross-cutting issues in the SDGs.

Figure 18 presents the MDG+ Initiative water supply and sanitation indicators that are able to contribute directly or have the potential to contribute to the evaluation of the water cross-cutting in the SDGs.

Figure 18. The MDG+ Initiative water supply and sanitation indicators and explicit and implicit water cross-cutting in the SDGs

		SDGs Targets (explicit water cross-cutting)									SDGs (implicit water cross-cutting)					
		1.4	3.3	3.9	4.a	11.1	11.6	12.4	14.1	15.1	2	5	8	9	10	13
MDG+ Water Supply Indicators	Served Population	CD			CD	CD						PC			PC	PC
	Water consumption									PC				PC		PC
	Continuity of supply				CD	CD						PC			PC	PC
	Water quality	CD	PC	PC	CD	CD						PC			PC	PC
	Distance to source	CD										PC			PC	
	Tariff Structure															
	Affordability	CD				CD						PC			PC	
MDG+ Sanitation Indicators	Served Population	CD			CD	CD	CD					PC			PC	
	Treated Wastewater	CD		PC	CD	CD	CD	PC	PC				PC		PC	PC
	Treatment type			PC				PC	PC				PC			
	Reuse Utilization										PC		PC			PC
	Reuse Type							PC	PC		PC					PC
	Tariff Structure															
	Affordability	CD				CD						PC				

CD: Contribute Directly to the evaluation of the SDG targets; **PC**: Potential to Contribute to the evaluation of the SDG targets

E. Building upon the MDG+ Initiative Indicator and Monitoring Framework

The developed MDG+ Initiative indicators and monitoring framework includes evaluation of water supply and sanitation indicators at piped water supply and sewerage systems levels. The MDG+ indicators respond perfectly to water, sanitation and wastewater treatment and reuse objectives stated in several water-related SDGs. To effectively contribute to regional follow-up on the water-related SDGs, the MDG+ indicators and monitoring framework should include evaluation of indicators at the on-site water supply and sanitation systems levels as shown in figures 19 and 20.

Figure 19. Upgraded MDG+ Initiative water supply indicator framework

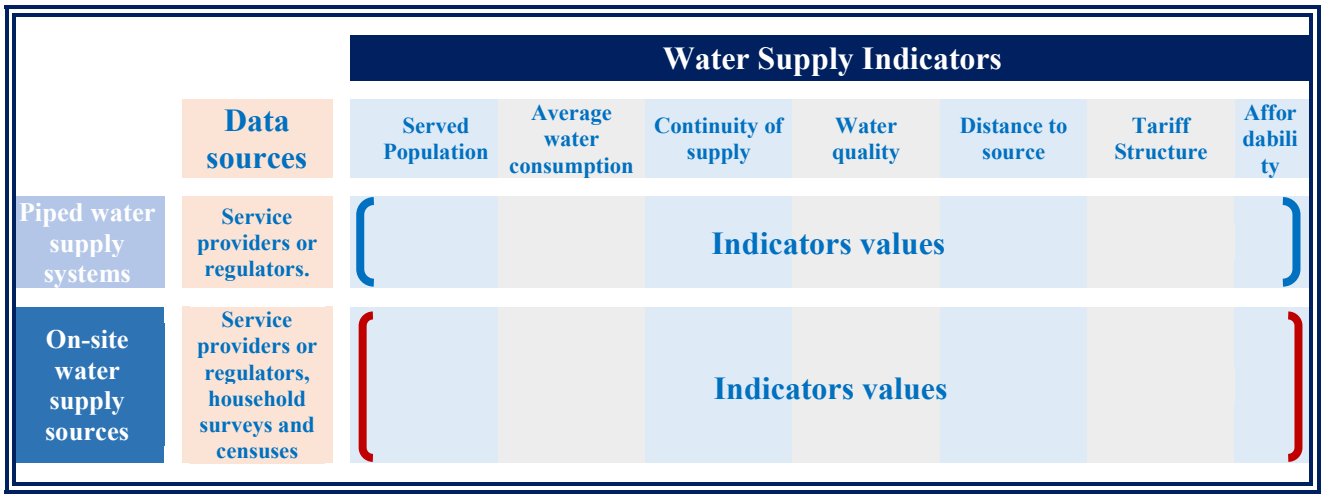
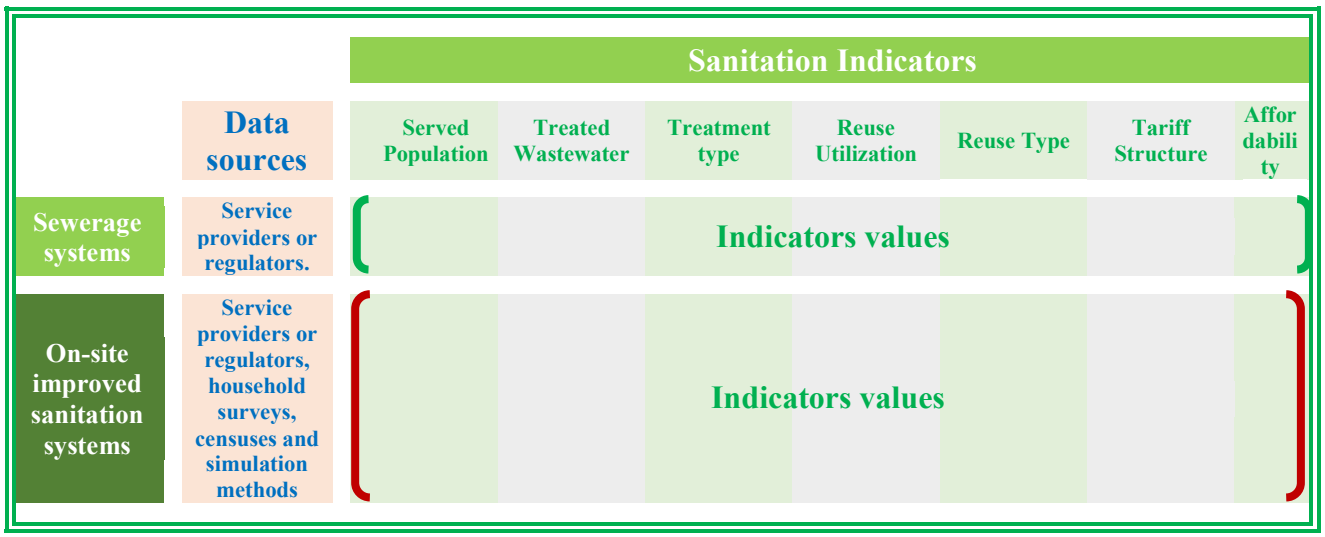


Figure 20. Upgraded MDG+ Initiative sanitation indicator framework



The evaluation of indicators at on-site water supply and sanitation systems levels necessitates the use of one or more of the following data sources: a) service providers or regulators, b) household surveys and censuses and c) simulation methods.

The following key issues related to the upgrading of the MDG+ Initiative to support monitoring and reporting on the water-related SDGs should be considered for discussion at the regional level:

- Ensuring coordinated role for national service providers and national statistical offices to produce coherent data on the water-related indicators on water supply, sanitation and wastewater provided by both piped systems and on-site systems.
- Developing a Water and Sanitation Key Indicator Survey (WSKIS), with shorter and simple questionnaires, which are focused on providing accurate data on water supply, sanitation and wastewater management systems, with the aim of pursuing annual monitoring frequency. The water and sanitation questionnaire used in the MDG+ field surveys could serve as starting point.
- Strengthening annual monitoring frameworks and an online approach to data collection and dissemination.
- Formulating a water-related SDG framework in the region that is based on an upgraded MDG+ Initiative and benefits from the lessons learned from the indicator and institutional aspects related to the implementation of the initiative over the last five years.

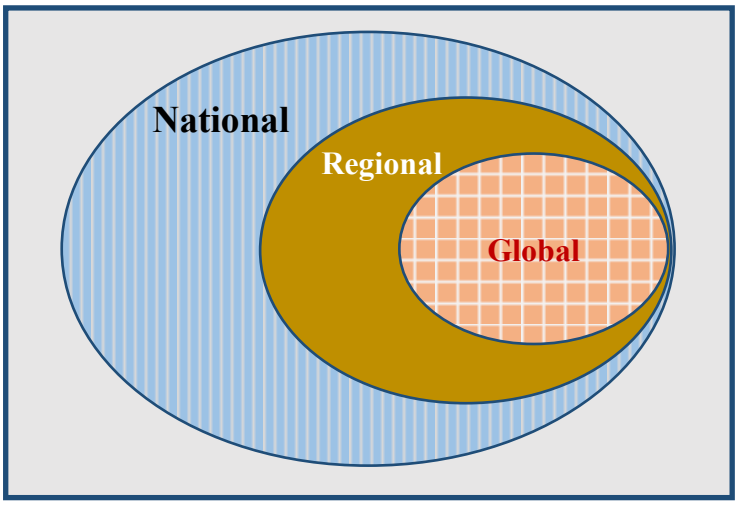
V. Regional monitoring and reporting on the water-related SDGs: Key issues for consideration

A. Indicator Aspects

Regional monitoring can play a significant role in fostering knowledge-sharing, promoting best practices and providing technical cooperation and capacity building across countries in the Arab region. It will also promote joint action to address the regional challenges and opportunities, such as shared water, and regional conflicts, or coordinate regional investment to improve regional infrastructure.

The regional indicators and monitoring framework could extend beyond the scope of the global monitoring framework and may include a number of additional indicators not considered under the SDGs (figure 21).

Figure 21. Schematic of the indicators for national, regional and global monitoring



The global monitoring aims to achieve a common worldwide consensus on a set of indicators that could be used for monitoring and reporting the water related SDG targets. The identification of common SDG indicators is restrained by the following two constraints: a) significance of the indicators to all countries and b) the availability of data required for evaluation of indicators. It is important to mention that each country (or region) is particular by its institutional, social, environmental and economic conditions that influence its water and sanitation policies and strategies. Therefore, the identification of the SDG indicators and their methods of calculation could be approached in different way according to the specific conditions of each country (or region).

Developing a regional monitoring and reporting mechanism for the water related SDG targets necessitates further discussions and coordination at the regional level to agree upon the relevant indicators, to identify data sources and to set the level of data disaggregation to monitor inequalities. The successful MDG+ Initiative proves that an autonomous Arab region monitoring and reporting mechanism is feasible. The upgraded MDG+ monitoring and reporting mechanism could be integrated into a regional indicator framework for monitoring and reporting the water related SDGs.

Arab States have a choice to purse at the regional and national levels a comprehensive agenda that seeks to achieve the 2030 Agenda for Sustainable Development's visionary objectives over the coming 15 years by adopting the global framework in full, or to be selective in their approach through a regional and/or priority-setting process. The latter would define the scope of work to be pursued over the coming decade and a half, as well as help to direct resources needed to pursue their achievement towards the appropriate sectors and inter-connected areas.

The following issues are thus suggested for deliberation at the regional level:

1- Decide whether to pursuing a comprehensive or priority-setting to the SDGs and their associated targets.
2- Determine which indicators satisfy monitoring and reporting needs to support achievement of those targets within the regional context within the coming 15 years.

3- Consider the resources and indicator-based monitoring frameworks available at the global level related to the collection of data on the indicators identified at the global level for monitoring progress towards the SDGs and their associated targets.

4- Consider if global resources and the indicator-based monitoring frameworks sufficient for generating the information need to inform progress on the achievement of the SDGs and targets adopted by Member States, including the linkages and inter-dependencies that influence the achievement of one SDG relative to another.

5- Consider if a nexus or clustering approach to the SDG targets could be a means to maximize effect, while minimizing the cost of monitoring and reporting progress on the achievement of the SDG targets.

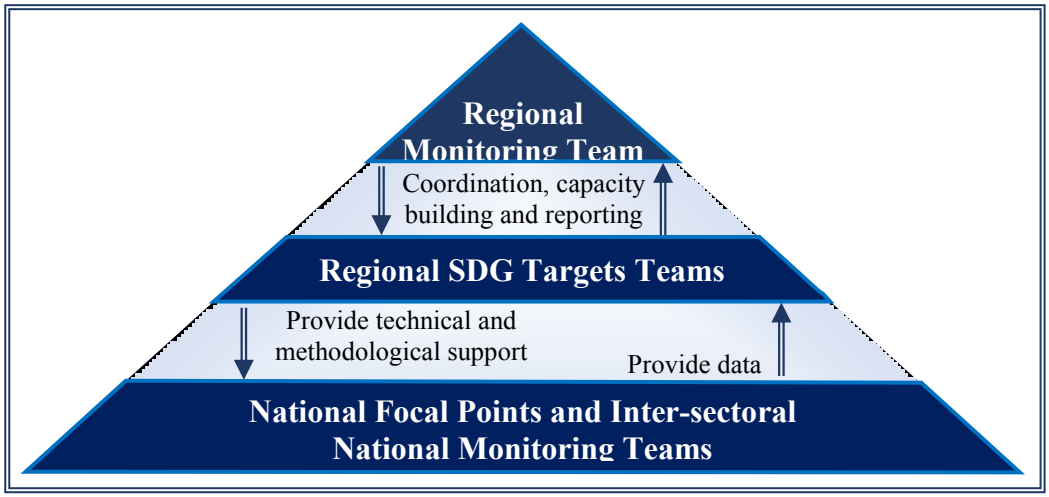
6- Identify the institutions framework for follow-up and review at the regional level for reporting on progress and sharing best practices and lessons learned.

B. Institutional Aspects

In considering an institutional framework for support this process, it is proposed that the future regional monitoring and reporting mechanism include the following consultative and coordinating mechanisms, as illustrated in figure 22, namely a:

- Regional monitoring team supported by technical SDG teams – that would support inter-governmental coordination, exchange and reporting; the regional technical SDG teams would be structured according to SDG clusters of priority concern for the region with a view to nexus interdependencies and would oversee the formulation of and training on common methodologies and approaches for transfer to the country level, and provide technical backstopping to country teams.
- Inter-sectoral country teams led by a National Focal Point – that would focus on specific indicator clusters coordinate, communicate and provide technical and methodological support to the national focal points and inter-sectoral monitoring teams. The National Focal Point would provide the consolidated feedback to the regional SDG target teams.

Figure 22. Proposed regional monitoring and reporting framework for the water-related SDGs



In addition to the above, regional monitoring and reporting framework must be associated with the consideration of the following important data and integrated indicators issues:

- Adopting innovative approaches to data collection and establishing strategies to harmonize unofficial metrics
- Make use of new innovative sources of data
- Establishment of a regional partnership in providing and sharing data
- Considering input variables and indicators as an integrated set to assess several targets and goals.

Some additional key questions for articulating a vision for an SDG monitoring and reporting framework in the Arab region are:

- What was the experience of the Arab region in pursing the MDGs? What should be done better or differently under the SDGs?
- How can the MDG+ Initiative support the collection of data from Arab States on the water-related SDG indicators?
- Can an integrated SDGs monitoring and reporting framework be beneficial for Arab States in light of common challenges and pressures faced by water scarcity and climate change?
- How integrated should monitoring and reporting be on the SDGs? Should clustering or a nexus approach be pursued across different SDGs?
- Should Arab States pursue monitoring and reporting on the water-related SDGs at the national, regional or global levels?
- What opportunities and challenges are presented by the use of new and innovative data sources in the region?
- What are the most important research, modelling and data gaps that can be bolstered by capacity building to generate plausible long-term assessments of the SDGs indicators?

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