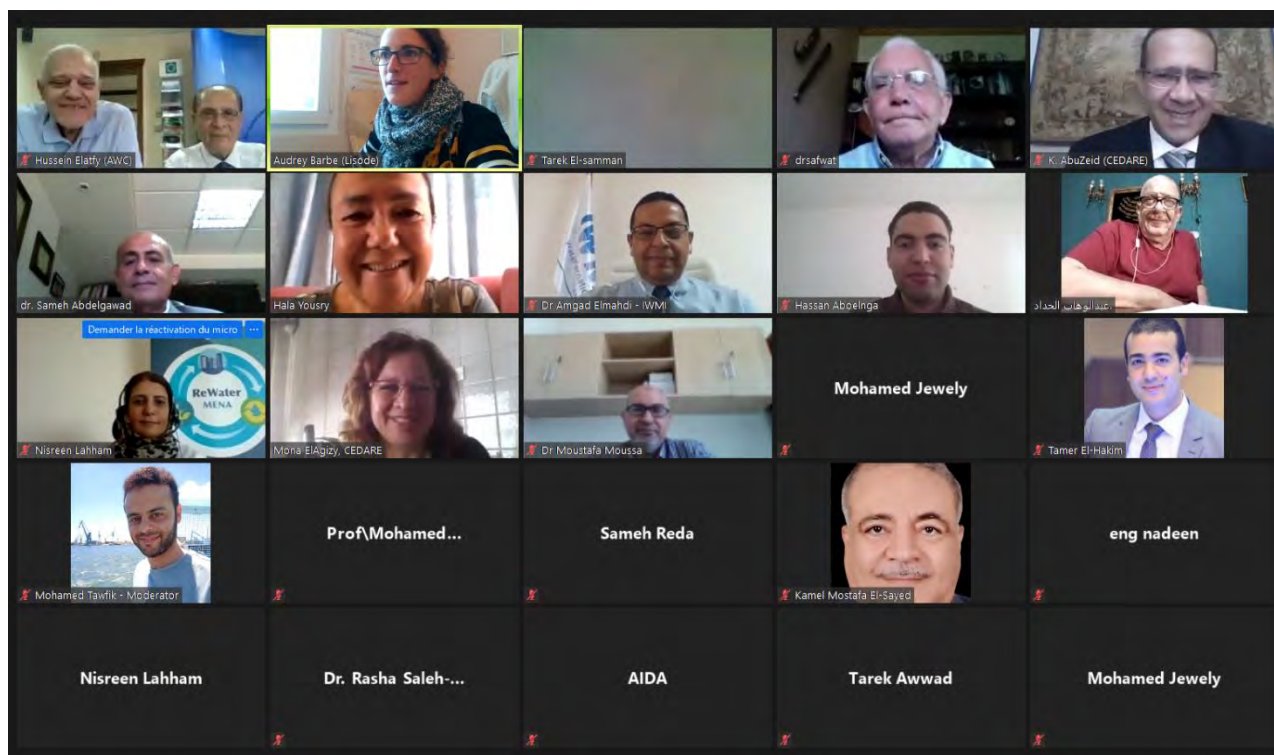




ReWater MENA Project

## 3rd NLA remote meeting – Consultation workshop on Egypt wastewater & water reuse 2030 targets – October, 14th 2020

Draft factual report



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## Agenda, participants and objectives of the workshop

This workshop is the third National Learning Alliance (NLA) of a series of 6 planned all along the ReWater MENA project, and aims to consult national stakeholders on Egypt wastewater & water reuse 2030 targets. The objective of this workshop was to quickly present the different plans and visions of wastewater and water reuse plan, and to discuss potential 2030 targets for reuse preliminarily formulated by CEDARE with the different stakeholders. This consultation is made to contribute to CEDARE's work on those targets; the latter will be refined after the workshop and an improved version will be presented and discussed over the 4<sup>th</sup> NLA, planned to be happening around December 2020 or January 2021.

Due to the Covid-19 global crisis, this workshop was organized remotely, using the online tool Zoom, instead of being a face-to-face meeting as originally planned. This tool allowed a plenary session as well as smaller groups, discussing specific topics. The session was organized over a 3-hour planning to keep the participants active in the discussions, both in plenary and groups.

### Detailed agenda of the day

The session was mainly divided into 3 main sessions: a presentation of Egypt wastewater & water reuse projections for 2030 and the preliminary proposed targets by CEDARE; then, 3 group discussions on specific topics and targets; finally, a session to have each group reporting on their work and discussions. The agenda was articulated as follows:

09:30 - 10:00	<b>Zoom Setup &amp; Registration</b> Audrey Barbe, Facilitator (Lisode)
<b>OPENING SESSION</b>	
10:00 - 10:05	<b>Welcoming Remarks</b> Dr. Khaled M. AbuZeid, Senior Regional Water Director (CEDARE)
10:05 - 10:10	<b>Welcoming Remarks</b> Dr. Amgad El Mahdi, Head of MENA Region office (IWMI)
10:10 - 10:15	<b>Introduction of the Participants &amp; the Agenda</b> Audrey Barbe, Facilitator (Lisode)
<b>SESSION I (Overview)</b>	
10:15 - 10:45	<b>Egypt Wastewater &amp; Water Reuse, 2030 Projections &amp; Preliminary Proposed Targets</b> Dr. Khaled M. AbuZeid, Senior Regional Water Director (CEDARE)
10:45 - 11:00	<b>General Discussion and Questions</b>
11:00 - 11:05	<b>Group Breakout Guidelines</b> Audrey Barbe, Facilitator (Lisode)
<b>SESSION II (Breakout Group Discussions)</b>	
11:05 - 12:00	<b>Discussion Group on 2030 National Targets</b> <b>Discussion Group on 2030 Local Targets</b>
12:00 - 12:05	<b>Break</b>
<b>SESSION III (Reporting on Results of Group Discussions)</b>	
12:05 - 12:20	<b>Group on 2030 National Targets</b>
12:20 - 12:30	<b>Plenary Discussion on National Targets</b>
12:30 - 12:40	<b>Group on 2030 Local Targets</b>
12:40 - 12:50	<b>Plenary Discussion on Local Targets</b>
<b>SESSION IV (Closing Session)</b>	
12:50 - 12:55	<b>Closing Remarks</b> Dr. Amgad El Mahdi, Head of MENA Region office (IWMI)
12:50 - 01:00	<b>Closing &amp; Way Forward</b> Dr. Khaled M. AbuZeid, Senior Regional Water Director (CEDARE)

Figure 1. Agenda of the remote 3rd National Learning Alliance held on October, 14th 2020

## Participants of the workshop

Despite the remote configuration a great participation was recorded, with a **maximum of 39 participants** connected, including the organizers' staff from more than 12 different institutions and organizations. The gender ratio was 29 men for 7 women (19 % of women and 81 % of men participating to the workshop).

ReWater-Egypt 3rd National Learning Alliance (NLA)			
No.	Organization	Name	Group
<b>National Steering Committee (NSC)</b>			
1	Arab Water Council (AWC)	Dr. Hussein El-Atfy	2
2	IWMI-MENA	Dr. Amgad El Mahdy	2
3	ICARDA	Eng. Rania Gamal	
4	CEDARE	Dr. Khaled Abu Zeid	1
5	Holding Co. For Water & Wastewater - HCWW	Dr. Rifaat Abdel Wahhab	
<b>Nominated NLA Members</b>			
6	Arab Water Council (AWC)	Prof. Dr. Tarek Ahmed El-Samman	3
7	EEAA	Dr. Rasha Saleh	1
8	MoALR	Dr. Alaa Mohamed Zoheir El Bably	
<b>Government Technical Representatives</b>			
9	MWRI	Dr. Tarek Awad	3
10	MWRI/ Groundwater	Eng. Ahmed Abdel Wahab	
11	Holding Co. For Water & Wastewater - HCWW	Dr. Yasser Youssef Abdel Hameed Abouelkheir	
<b>Consulting Experts</b>			
12	Former Minister of Utilities & Governor of Cairo	Dr. Abdelkawi Khaleefa	
13	National Water Research Center / West Delta Improvement Project	Dr. Safwat Abdel Dayem	3
14	Cairo University / Misr Consultants	Dr. Sameh Abdelgawad	3
15	Desert Research Center	Dr. Hala Yousry	3
<b>Water Users'/Farmers' Associations</b>			
16	Elrash Water Users Association	Dr. Abdel Wahab Elhadad	2
<b>Non-Governmental Organizations (NGOs)</b>			
17	Egyptian Water Partnership - EWP	Dr. Mahmoud Abu-Zeid	2
18	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Prof. Dr. Farag. A. Samhan	2
19	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Prof. Dr. Mohamed Hassan Mostafa	
20	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Dr. Tarek Sabry El Metwally	2
21	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Eng. Khaled Diaa Eldin Shaheen	3
22	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Eng. Nadeen	1
23	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Eng. Aida Basyouni	
24	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Eng. Hesham Gaafar	3
25	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Eng. Hager	
26	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Eng. Mohamed Halim	

27	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Eng. Doaa Gamil	
28	Egyptian Water and Wastewater Regulatory Agency (EWRA)	Eng. Sameh Reda	2
	<b>Academia &amp; Research Representatives</b>		
29	Zewail city	Dr. Moustafa Moussa	2
	<b>International &amp; Regional Organizations</b>		
30	African Development Bank	Dr. Yasser Elwan	2
31	GIZ	Ms. Maha Khallaf	2
32	GIZ	Mr. Mohamed Ali	
33	Arab Organization for Agricultural Development (AOAD)	Eng. Kamel Mostafa Elsayed Amer	
	<b>ReWater MENA project</b>		
34	IWMI-MENA	Dr. Nisreen Lahham	3
35	IWMI (Group facilitator)	Mr. Mohamed Tawfik	2
36	CEDARE	Eng. Mona El Agizy	3
37	CEDARE	Eng. Tamer El-Hakim	2
	<b>Facilitators</b>		
38	Lisode (Moderator)	Audrey Barbe	Moderator
39	Lisode (Group facilitator)	Eng. Hassan Abou-Elnaga	1
40	Zewail University (Group facilitator)	Mohamed Gewely	3

## Report of workshop activities

### Opening remarks

This meeting started with welcoming remarks from CEDARE and IWMI, partners of the ReWater MENA project.

Dr. Khaled AbuZeid (CEDARE) began the workshop by emphasizing the main aim of the workshop: discussing the targets of wastewater and water strategies in Egypt, based on a 2017 baseline to a vision of 2030. He explained that CEDARE based its preliminary work and suggestions on the Sustainable Development Goals (SDG) agenda and already existing national strategies, while considering treated wastewater as a new resource to support future demands.

Dr. Amgad Elmahdi (IWMI) reminded the participants that the ReWater MENA project is about putting effective strategies for treated wastewater reuse in the region, taking into account the experiences of Jordan, which is advanced in the field of wastewater reuse.

Lisode did the technical moderation of the workshop, starting by the presentation of the agenda and reminding the participants on the communication rules required for a remote session.

### Session 1: Egypt wastewater & water reuse, 2030 projections & preliminary proposed targets

#### Presentation by Dr. Khaled AbuZeid, CEDARE

Dr. Khaled AbuZeid started his presentation by reminding the overall process in the preparation of the strategy consisting of 3 stages: Baseline, Targets and Strategy. In each stage, there is an NLA workshop

for consultation and then for validation. Thus, 6 NLA workshops are held to share experiences and to provide feedback. This NLA, the NLA 3, is the consultation on the proposed targets. NLA 4 will be oriented towards the validation of the 2030 reuse targets for Egypt; then, NLA 5 and NLA 6 will be dedicated to the discussions about the strategy to reach 2030 reuse targets.

Then, he presented some statistics to the audience, in terms of wastewater treatment, primary, secondary and tertiary treatments, and what is the current situation of reuse in Egypt. Afterwards, Dr. Khaled AbuZeid detailed the 2030 projections of population growth and how that translates in terms of domestic waste and wastewater production for reuse in 2030.

Afterwards, Dr. Khaled reviewed the current visions, strategies and plans. These strategies had different targets, while they did not address reuse of treated wastewater as a clear target. Finally, he detailed the 25 national and 9 local proposed 2030 reuse targets for different categories as presented in the table below. He also referred to demonstration of local targets in North Sinai, and he proposed new local targets in West Menya, El-Marashda, Aswan, El-Tor, West Delta and the new Administrative Capital City.

The participants have the opportunity to provide their feedback and input in the general forum as well as in the working groups.

Table 1. Categories of targets for national and local proposed reuse targets

Categories for national targets	Categories for local targets
<ul style="list-style-type: none"> <li>• Sanitation coverage for planned reuse</li> <li>• Mixed industrial and domestic wastewater reuse</li> <li>• Clean water bodies for indirect reuse</li> <li>• Level of wastewater treatment for appropriate reuse</li> <li>• Increase of reuse</li> <li>• Reuse of freshwater savings</li> <li>• Reduce and reuse wastewater disposal to sea and lakes</li> <li>• Reuse for agriculture development &amp; urban landscaping</li> </ul>	<ul style="list-style-type: none"> <li>• Treatment and reuse of mixed agriculture drainage &amp; wastewater</li> <li>• Swap non-renewable groundwater with direct treated wastewater reuse</li> <li>• Supplement depleted groundwater with treated reused water</li> <li>• Wastewater reuse for new cities landscaping and neighboring agriculture</li> </ul>



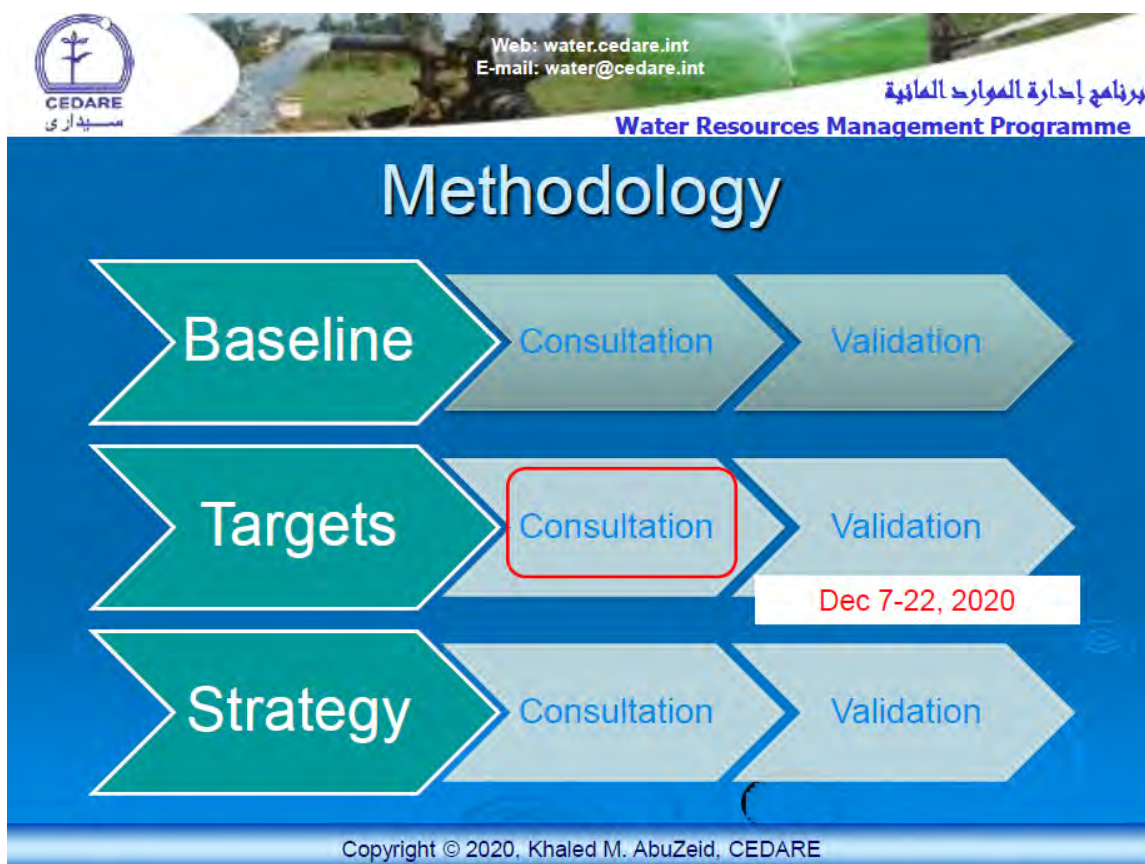


Figure 2. Extract of CEDARE presentation on the 2030 reuse targets

The full list of targets proposed by CEDARE is presented in the appendix of that report (cf. Appendix A. National Targets in Current Vision Strategies and Plans

Table 5. List of National Targets on Current Vision Strategies and Plans by CEDARE.

National Targets in current Visions, Strategies, and Plans	
2030 UN Sustainable Development Goal 6 (SDG 6)	
1	SDG Target 6.2.1.a: By 2030, Achieve access to adequate and equitable & safely managed sanitation for all. (A safely managed sanitation facility is one where excreta is safely disposed of in situ or treated off-site.)
2	SDG Target 6.3.1.a: By 2030, Halving the proportion of untreated (and unsafely treated) domestic and industrial wastewater
3	SDG Target 6.3.1.b: By 2030, Substantially increasing recycling and safe reuse globally.
Egypt Sustainable Development Strategy (SDS) 2030 Vision	
4	By 2030, Increase the share of non-conventional water resources to the total water resources used from 20% in 2017 to 40%.
5	By 2030, Increase the share of treated wastewater to total generated wastewater from 50% in 2017 to 80%.
6	By 2030, Decrease the share of disposed non-compliant industrial wastewater along the Nile to total disposed industrial wastewater from 21% in 2017 to 0%.
7	By 2030, Increase the share of domestic wastewater meeting standards to the Nile River from 50% in 2017 to 100%.
MWRI for Sustainable Development Strategy (SDS) 2030 Vision	
8	By 2030, Increase non-conventional water resources used as a percentage of total used water resources from 26% in 2017 to 28%.



9	By 2030, Increase treated domestic wastewater from 4 BCM in 2017 to 10.2 BCM.
10	By 2030, Increase agricultural drainage & domestic wastewater mixed with fresh water for irrigation (Indirect Use) from 13.5 BCM in 2017 to 16 BCM.
<b><u>The National Water Resources Plan 2017-2030-2037 (MWRI 7/2017)</u></b>	
11	By 2037, 50% of the agricultural drainage flow will be safely reused for agricultural purposes.
<b><u>Reuse of Domestic &amp; Agricultural Wastewater Roadmap (2017)</u></b>	
12	Modify National Strategies, Plans, Laws (up to 2 years).
<b><u>2030 Strategic Vision for Treated Wastewater Reuse (CEDARE, MWRI, MOA, MHUUC/HCWW, MOH, MOE, MOI)</u></b>	
13	By 2030, Upgrade 0.9 BCM of primary treated wastewater in 2011 to secondary treatment.
14	By 2030, Eliminate all untreated wastewater (treat by secondary treatment)
15	By 2030, Increase the amount of secondary treated wastewater (domestic and industrial) from 2.42 BCM in 2011 to 11.61 BCM.
16	By 2030, Continue to operate the tertiary treatment (domestic and industrial) facilities without building new tertiary treatment plants.
17	By 2030, Increase direct reuse of treated wastewater from 0.27 BCM in 2011 to 5.82 BCM.
18	By 2030, Increase Indirect reuse of treated wastewater from 3.10 BCM in 2011 to 5.53 BCM.

Appendix B. National and local proposed 2030 reuse targets).

## General discussion

The time allocated to the general discussion was quite brief and only a few comments and questions could be made. The participants were encouraged to keep their comments for the group discussions or for the general discussion planned in session 3 to limit the delays.

**Dr. Abdelkawi Khalifa** asked for changing the mindsets regarding wastewater reuse and thus, advised to look at the quantity, the quality and the need of monitoring systems for those parameters. He insisted on the fact that we should be realistic about the targets of wastewater reuse and that there is a need of more detailed studies, especially in Abu-Rawash.

**Dr. Safwat** highlighted that all different types of wastewater should be in the total water balance and should not be duplicated in the water balance, especially for agriculture drainage. He insisted that the quantity of agricultural drainage would be reduced when having a vision to shift from surface irrigation to drip irrigation, and that it is necessary to take into account the use in the West Delta (social acceptance issue).

## Session 2: Group discussions on national and local targets

### Division of groups and methodology of group discussions

Considering the high number of total targets (25 national and 9 local targets) and the limited, the group discussions could not discuss all the targets within one hour approximately. It was suggested and decided to spread a survey (prepared by CEDARE) to the participants, before the NLA meeting. In that survey, the participants were asked to identify whether a proposed target was:

- Realistic & feasible
- Highly ambitious & not feasible
- Not ambitious enough.

Looking at the answers showed a consensus on some targets. It was decided that:

- Targets consensually defined as realistic & feasible would not be discussed during the NLA;
- Targets consensually defined as highly ambitious & not feasible or not ambitious enough would be discussed during the NLA.

The survey was spread very closely to the NLA meeting therefore, 22 answers were collected before the beginning of the meeting.

This led to the identification of 12 national targets and 4 local targets to be discussed. The national targets for discussion were divided between groups 1 and 2, while group 3 discussed the local targets. The full list will be detailed for each group of discussions.

### Group discussions results

Then, Lisode explained the participants how splitting in rooms is happening on Zoom and what they should do to join their group. Lisode and CEDARE split the participants in 3 groups; the participants in each group are indicated in Table 1.

Each group had a specific list of targets to be discussed and commented, covering the 12 national targets and the 4 local targets mentioned just before. The entire list of targets could not be discussed within the entire workshop.

Each group discussion was facilitated in order to regulate the flow of speeches, give everyone a turn to speak and allow everyone to express themselves and give their opinion.

## Results

### Group 1 – 1<sup>st</sup> set of national targets

The 1<sup>st</sup> group gathered 5 participants and was planned to discuss and comment national targets 4, 6, 7, 8, 23 and 25. As there were connections with other targets, they took the opportunity to discuss targets 1 and 24 in addition.

Table 2. Results of the 1st group discussions on national targets #4, 6, 7, 8, 23 and 25.

National target (number and title)	Agreed value or suggestions?
#1 – By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta are safely disposed of in situ or treated off-site. (UN SDG 6.2.1.a)	
	Agreed
#4 – By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision)	
The target is highly ambitious with primary treatment issues and it should rather be decreased to 70% as an objective.	80
The definition should clarify direct and indirect reuse. (This target does not discuss reuse. It is about « <b>Clean Water Bodies for Indirect Reuse</b> »)	
#6 – By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)	
This target is feasible since all factories are required to have treatment plants and they will be monitored by the Ministry of Environment. All factories are to be equipped with a monitoring system for all factories (modified resolution no. 1963 in 2017, article 2 in the law of environment) to have treatment plants	Agreed, feasible
#7 – By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)	
Many primary treatments only exist	Agreed, feasible
There is a need for a study to quantify the septic tanks and their types (Ministry of Housing and infrastructure)	
We should mind the collectable amounts from septic tanks (and their treatment)	
#8 – By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision)	
The target could be merged with 7	Agreed
#23 – By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New)	
Change the target title: to add directly and indirectly to the target	Agreed
There is the need to monitor wastewater quantity and quality directed to agricultural drainage.	

#24 – By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)	
	Need assessment
#25 – By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)	
5 BCM is reused for agriculture – this data and the target should be revised change add at least 30%	Need assessment
The target needs to be modified, adding indirect reuse, and considering the re-assessment of the number 600,000 feddans	

## Group 2 – 2<sup>nd</sup> set of national targets

The 2<sup>nd</sup> group gathered 11 participants and was planned to discuss and comment national targets 10, 12, 13, 15, 19 and 21. The discussions were very active in that group; they did not have the time to react on target 21.

Table 3. Results of the 2nd group discussion on national targets 10, 12, 13, 15, 19 and 21.

National target (number and title)	Agreed value or suggestions?
#10 - By 2030, increase the proportion of non-conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)	
Dr. Mustafa Moussa: <u>it is a feasible</u> , however, its achievement relates to the Ministry of Water Resources and Irrigation (MWRI). Another question is, <u>where will the 2% come from?</u> We will need substantial investments in sanitation coverage (particularly in rural areas) to increase this 2%	
Tarek Sabry: <u>it is not clear what is means/included</u> in the "non-conventional" water resources?	
Dr. Hussein Elatfy: it is important to match this target with the Ministry of Housing plan of sanitation services	
Yasser Elwan: the target is <u>achievable and/or already been achieved</u> through the current wastewater reuse projects. Perhaps it would be necessary to <u>increase the target</u> (up to 30%) and <u>clarify the purpose of reuse</u> .	
Eng. Sameh (Ministry of Housing): the <u>definition of non-conventional is contested between the different institutions</u> (MWRI and the Ministry of Housing) each one of them looks at it from a different perspective. So, it is important to know "whose vision" is being considered. However, the target (2%) is considered low and it can be raised.	
#12 - By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)	
Sameh: It means that all WWTPs have to be fully functioning with a high efficiency in order to achieve this target. Accordingly, there will be <u>substantial investments</u> required to rehabilitate existing wastewater treatment plants and build new ones	
Moussa: <u>very challenging target</u> because it needs a lot of investment and asset management	
Mahmoud AbuZeid: it is <u>not clear</u> how much will be treated and reused and what level of treatment is required. Accordingly, we cannot decide if 100% is possible or not	

Tarek: the main <u>challenge is rural sanitation coverage</u> , which is very low. And the question of where wastewater reuse will take place (there is the drainage system in the delta, but for desert-front governorates this will be challenging)	
#13 - By 2030, increase <u>direct</u> reuse of treated wastewater from <b>0.27 BCM in 2011</b> to 5.5 BCM. (CEDARE 2030 Reuse Vision)	
Sameh: again, the main challenge is the " <u>contested definitions</u> " and different perspectives originated from the institutional differences	
Moussa: the challenge of direct reuse is the social acceptance of the treated wastewater by end users	
Mahmoud AbuZeid: First we need to know what is the total amount of the generated wastewater, and what are the different levels of treatment	
Tarek: direct re-use is only possible in desert-front governorates, so the important question is whether we have sanitation coverage in these places? If not, then it will <u>require substantial investments</u> .	
#15 - By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)	
Hussein ElAtfy: increasing the amount of treated wastewater for direct re-use (in the previous target #13) will definitely affect the amount of treated wastewater for indirect, however, the <u>target itself is feasible</u> . There is a need of "harmonization" between the targets.	
Sameh: this target is close to the portfolio of MWRI than that of the Ministry of Housing. Additionally, the new irrigation technologies that is promoted for farmers to use, will reduce the amount of agricultural drainage and thus the amount of water available for indirect reuse. Therefore, the <u>target could be 14 not 16 BCM</u>	
Tarek: agree with Hussein	
#19 - By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)	
Hussein: <u>could be feasible</u> , but 20% depends on many factors, and the agricultural sector will need to consider other sources for irrigation	
Mahmoud AbuZeid: the percentage should be from the total Nile Water quote of Egypt, not from the amount of water allocated for irrigation.	
Moussa: we <u>need clear definitions for all terminologies</u> . This is a valid target but it needs water accounting and good database that inform decision-makers on water uses and water resources allocations.	
Dr. Amgad: I agree with Dr. Moussa - water accounting will avoid double counting in water balance and make targets clear	
Sameh: 20% is big number this could be more than 10 BCM, and probably cannot be compensated by treated domestic wastewater. There is a need for close co-operation between MWRI and the Ministry of Housing.	
#21 - By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New)	

### Group 3 – Local targets

The 3<sup>rd</sup> group gathered 9 participants and was planned to discuss and comment local targets 1, 3, 4 and 5. The participants of that group actually considered that the proposed targets were more or less discussing the main ideas (mixing wastewater and using it for agriculture) but in different areas. They

were rather keen to discuss all points in general rather than specific targets. Comments and results of those discussions are detailed in the table, and concern targets “in general”.

The participants were more concerned about the feasibility of mixing waste water and using for agriculture. They did ask where the numbers of the targets came from (ex 1.83 BCM/Y) and were wondering about the credibility of these large numbers.

Table 4. Results of the 3rd group discussions on local targets 1, 3, 4 and 5.

Treatment and Reuse of Mixed Agriculture Drainage & Wastewater	Agreed value? Proposal?
#1 - By 2030, treat and (indirectly/directly) reuse 1.83 BCM/y of mixed agriculture drainage and wastewater from Bahr El Baqr drain for 365,000 feddans of agriculture in North Sinai	
#3 - By 2030, swap 1.4 BCM/y of allocated nonrenewable groundwater with direct treated wastewater for 180,000 feddans of agriculture lands within the 1.5 million feddans project and save fresh groundwater for drinking purposes	
#4 - By 2030, swap 0.7 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 140,000 feddans of agriculture lands in West Menya & West West Menia within the 1.5 million feddans project	
#5 - By 2030, swap 0.10 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 20,000 feddans of agriculture lands in El-Marashda, Qena within the 1.5 million feddans project	
Reuse water or intervene in any part of the cycle that is already being applied can cause water balance deficit. Meaning that wastewater is already being reused (illegally) in some areas without treatment, and intervening in any part of the water cycle would necessarily cause water balance deficit.	
New irrigation technologies that will be used in future (like drip irrigation) might cause a change in quality of water for irrigation and drainage water, so it cannot be used for irrigation again.	
Egypt needs to have an economic plan of the cost it would take to clean this water and pump it over large distances, to see if there would be any profits.	
The mixed agricultural drainage and treated wastewater should be used to grow crops of higher value (cost) to cover expenses of the whole process.	
The amount of wastewater planned to be allocated sounds <u>more optimistic and not realistic</u> . Especially, because other sectors also have goals of decreasing usage of clean water in the future. If usage of clean water decreases then waste water coming out of it will also decrease. So, the amount of wastewater proposed should take into considerations, the plans of decreasing usage of clean water.	
Are these <u>numbers based on the amounts of wastewater</u> that will be produced by 2030 or based on amounts calculated in the present case? Are the figures realistic?	
There must be an <u>integrated plan with other sectors</u> that are willing to make improvements as well, to be closer to reality.	
There is a social factor that affects decisions and may intervene in the plans.	
Mass balance calculations must be made to <u>make sure that goals are matching reality</u> .	



There is a need for thorough study of agricultural plan, and decentralized plan for the certain areas proposed, to test social acceptance, best crops to grow, land features, sensitivity of certain crops, and proposed industries.	
Feasibility study for the whole process of transferring treated wastewater over large distances and of mixing it with underground water, including wastewater collection, transportation, maintenance, energy usage. Feasibility study should include economic feasibility and sustainability.	
Existing strategies, for example strategies of irrigation and agriculture are already complicated and hinder any chances for developments. So, these goals must study different strategies before proposing targets.	
Social Acceptance is hard because people refuse to use treated wastewater for irrigation, especially because they export their crops.	
Food quality parameters to countries where Egypt is exporting food products are very selective. Using treated wastewater would affect exporting to other countries. Using <u>treated wastewater can only be used for local farming</u> . International food quality standards have sections that we don't have in Egyptian code.	
Integration of plans and goals between industries is important, to be sure that our numbers and plans are feasible. The wastewater sector should not just plan on its own, because other sectors might have other plans for water as well (and planning together would lead to a more realistic situation.	
Instead of transporting treated waste water which may not be feasible, we can make the cropping fields closer to near cities.	
Decision makers should include the end sector (farmers and landowners) and people who are in proposed places of growing crops and hear their concerns, and engage them in the workshop. Social factor is a great obstacle that we must consider.	

### Overall recommendations from the group discussions on the targets

- Merge national targets 7 and 8.
- Need more assessment for target 24 and 25.
- Need to be more specific on the definitions & the terminology: direct / indirect reuse (everyone does not use the same terminology); non-conventional water, what is included?
- Some targets seem feasible, some other will require substantial investments to reach the objective
- Overall, targets seem feasible (in a way) but with the lack of clarity on the definitions and terminology, does not help to give a clear opinion on it.

### Session 3: Group reporting session

The group discussions time last more than initially planned and it was agreed to reduce the time spent in group reporting to avoid having extended delays. The facilitators of each groups quickly presented the results of their discussions and then, the participants could react, comment and ask for clarifications. Below is the list of comments made.

- Direct reuse will affect the non-direct reuse

- There is a need for a robust water accounting system in order not to duplicate quantities of wastewater in terms of directed and indirect use.
- There is the need to take into account the social acceptance of end-users and include the future plans of the Ministry of Housing (made to allocate wastewater treatments near to the new areas.
- Need to engage end-users, especially the ones exporting their products outside of Egypt; need to define the quality of wastewater reuse in those areas, according to the regulations of countries where production is exported.
- Need to take into consideration new cities and areas, and the feasibility of wastewater reuse there
- Need to define the basis of numbers of the proposed targets
- CEDARE also asked all the participants to update them with any recent plans or laws, including nominating related key experts and users.

### More comments coming from the WhatsApp group

Dr. Rasha: The decision of the Ministry of Irrigation for the year 2013, which contains Article No. 5 prohibiting wastewater drainage of whatever degree of treatment to fresh surfaces and underground tanks, and Article 6 that the treated industrial waste should not be mixed with wastewater, whatever it is treated, and which is authorized to be discharged into fresh water bodies. She refers to the targets 5,6,7,8 and 9 and this is what was discussed in the working group 1.

Dr. Khaled: Treated industrial wastewater on fresh surfaces is permitted, and treated sewage drainage is not permitted on fresh surfaces.

Tarek: The disposal of industrial facilities on the Nile River has become prohibited in Article 8 of the law.

### Evaluation of the workshop

At the end of the workshop, the participants were asked to fill in an anonymous evaluation form prepared by Lisode, containing the 8 following questions:

1. The objectives of the day were clear and transparent
2. The day was useful
3. I understand what the ReWater MENA project is about.
4. I know how I can contribute to the project.
5. The participants well represented the different points of view.
6. The remote work method (tools, animation) was effective.
7. The facilitators were impartial with regard to the content of the discussions.
8. I had the opportunity to express and give my opinion.

In face-to-face meetings, those questions come along with the possibility to write open comments. Using Zoom and willing to collect feedbacks, the possibility of online survey with Zoom does not allow open comments. Thus, this evaluation only reports the quantitative answers to the 8 questions and no qualitative evaluation was possible.

When the form was proposed, around 30 participants were still connected, including the organization and facilitation staff. Out of them, 18 participants filled in the form (see Figure 3).

### Analysis of the evaluation results

The overall quantitative results are highly positive with 128 “I rather agree” answers (89%) whereas we have 4 “I don’t know” and 12 “I rather disagree” answers (3 and 8% respectively), on a total of 144 answers.

In details, the evaluation shows that **all the participants** answering the forms consider they had the opportunity to **express and give their opinion** (Question 8).

Then, almost all the participants agree with the Questions 2 and 3, with only 1 participant who disagrees for each topic. To be more specific, the participants **disagreed about the usefulness of the day** (Question 2) and **the understanding of the ReWater MENA project** (Question 3). To the question 7 about impartiality of the **facilitators with regard to the content of the discussions**, only 1 participant disagreed, and 2 answered “I don’t know”.

On the questions 1 and 6, 16 participants agree with the question, leaving 2 participants in disagreement for each question. Meaning that few participants consider that the **objectives of the day were not very clear and transparent** (Question 1), and that the **remote work method was not so effective** (Question 6). To the question 4, we had 2 “I rather disagree” and 1 “I don’t know” when referring to the fact that participants **know how they can contribute to the project**.

Finally, the lowest score in terms of level of agreement is the question 5 (whether the **participants well represented the different points of view**), with 3 participants who disagreed and 1 who did not know.

### Results of the anonymous evaluation of the plenary remote session organised for the 3rd NLA on October, 14th 2020

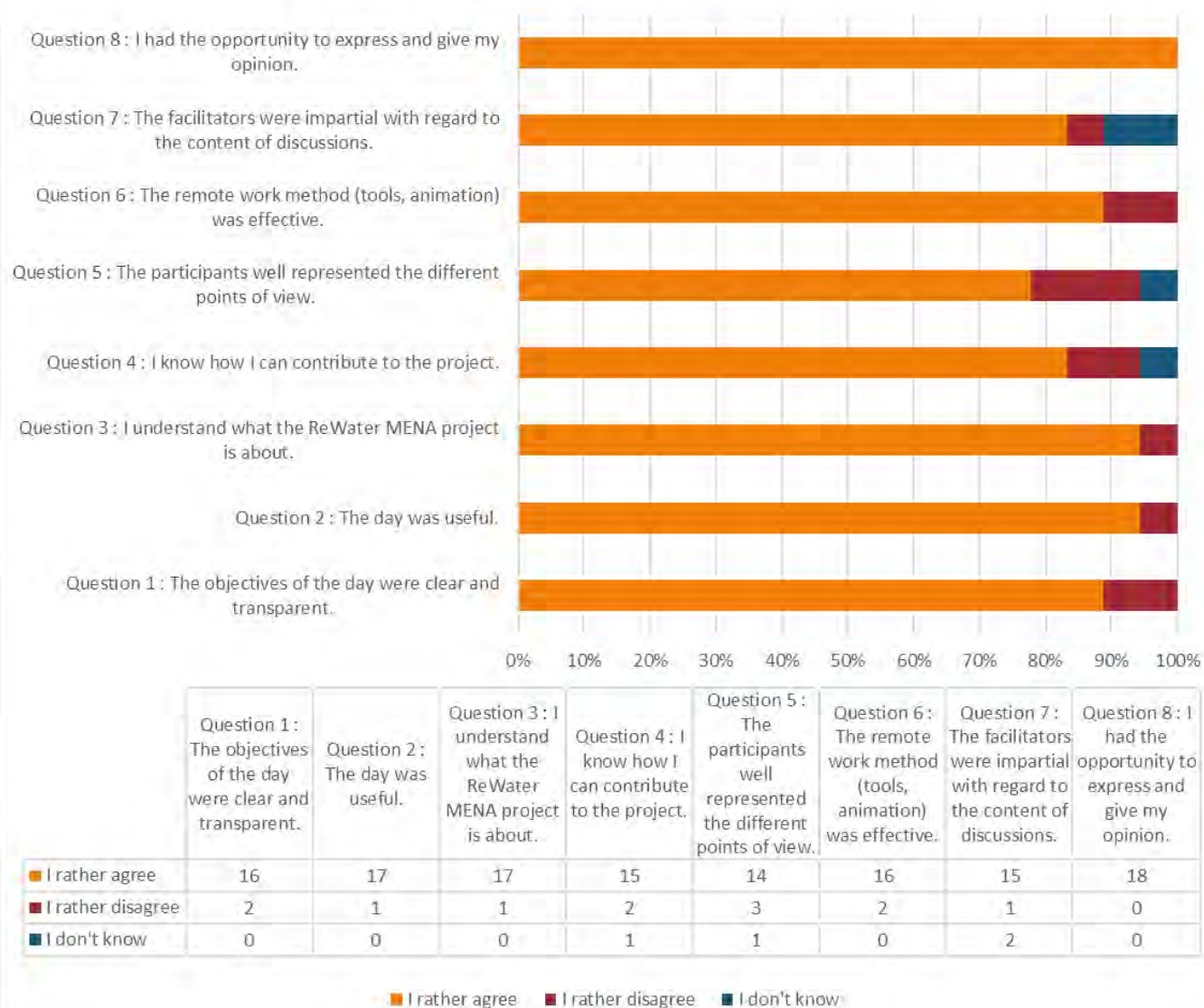


Figure 3: Quantitative results of the anonymous evaluation of the 3rd NLA meeting organized remotely.

## Appendix A. National Targets in Current Vision Strategies and Plans

Table 5. List of National Targets on Current Vision Strategies and Plans by CEDARE.

National Targets in current Visions, Strategies, and Plans	
<b>2030 UN Sustainable Development Goal 6 (SDG 6)</b>	
1	SDG Target 6.2.1.a: By 2030, Achieve access to adequate and equitable & safely managed sanitation for all. (A safely managed sanitation facility is one where excreta is safely disposed of in situ or treated off-site.)
2	SDG Target 6.3.1.a: By 2030, Halving the proportion of untreated (and unsafely treated) domestic and industrial wastewater
3	SDG Target 6.3.1.b: By 2030, Substantially increasing recycling and safe reuse globally.
<b>Egypt Sustainable Development Strategy (SDS) 2030 Vision</b>	
4	By 2030, Increase the share of non-conventional water resources to the total water resources used from 20% in 2017 to 40%.
5	By 2030, Increase the share of treated wastewater to total generated wastewater from 50% in 2017 to 80%.
6	By 2030, Decrease the share of disposed non-compliant industrial wastewater along the Nile to total disposed industrial wastewater from 21% in 2017 to 0%.
7	By 2030, Increase the share of domestic wastewater meeting standards to the Nile River from 50% in 2017 to 100%.
<b>MWRI for Sustainable Development Strategy (SDS) 2030 Vision</b>	
8	By 2030, Increase non-conventional water resources used as a percentage of total used water resources from 26% in 2017 to 28%.
9	By 2030, Increase treated domestic wastewater from 4 BCM in 2017 to 10.2 BCM.
10	By 2030, Increase agricultural drainage & domestic wastewater mixed with fresh water for irrigation (Indirect Use) from 13.5 BCM in 2017 to 16 BCM.
<b>The National Water Resources Plan 2017-2030-2037 (MWRI 7/2017)</b>	
11	By 2037, 50% of the agricultural drainage flow will be safely reused for agricultural purposes.
<b>Reuse of Domestic &amp; Agricultural Wastewater Roadmap (2017)</b>	
12	Modify National Strategies, Plans, Laws (up to 2 years).
<b>2030 Strategic Vision for Treated Wastewater Reuse (CEDARE, MWRI, MOA, MHUUC/HCWW, MOH, MOE, MOI)</b>	
13	By 2030, Upgrade 0.9 BCM of primary treated wastewater in 2011 to secondary treatment.
14	By 2030, Eliminate all untreated wastewater (treat by secondary treatment)
15	By 2030, Increase the amount of secondary treated wastewater (domestic and industrial) from 2.42 BCM in 2011 to 11.61 BCM.
16	By 2030, Continue to operate the tertiary treatment (domestic and industrial) facilities without building new tertiary treatment plants.
17	By 2030, Increase direct reuse of treated wastewater from 0.27 BCM in 2011 to 5.82 BCM.
18	By 2030, Increase Indirect reuse of treated wastewater from 3.10 BCM in 2011 to 5.53 BCM.

## Appendix B. National and local proposed 2030 reuse targets

Table 6. List of national 2030 reuse targets proposed by CEDARE for this 3<sup>rd</sup> NLA meeting.

	<b>National Proposed 2030 Reuse Targets</b>
	<b>Sanitation Coverage for Planned Reuse</b>
1	By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta is safely disposed of in situ or treated off-site. (UN SDG 6.2.1.a)
	<b>Mixed Industrial and Domestic Wastewater Reuse</b>
2	By 2030, halve the proportion of untreated (and unsafely treated) Domestic and Industrial wastewater produced from 60% in 2015 to 30%, and ensure that at least 70% of the produced wastewater is safely treated. (UN SDG 6.3.1.a)
3	By 2030, eliminate disposed non-compliant industrial wastewater to the wastewater network. (New)
	<b>Clean Water Bodies for Indirect Reuse</b>
4	By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision)
5	By 2030, eliminate disposed non-compliant industrial wastewater into the Nile from 21% of total disposed industrial wastewater into the Nile in 2017. (Egypt SDS 2030 Vision)
6	By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)
	<b>Level of Wastewater Treatment for Appropriate Reuse</b>
7	By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)
8	By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision)
9	By 2030, increase the proportion of tertiary treated wastewater to reach 10% of produced domestic wastewater. (New)
	<b>Increase of Reuse</b>
10	By 2030, increase the proportion of non-conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)
11	By 2030, increase the ratio of non-conventional water resources used to the conventional water resources used from <b>36% in 2015</b> to 45%. (New)
12	By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)
13	By 2030, increase <u>direct</u> reuse of treated wastewater from <b>0.27 BCM in 2011</b> to 5.5 BCM. (CEDARE 2030 Reuse Vision)
14	By 2030, increase <u>direct</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)
15	By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)
16	By 2030, increase <u>indirect</u> reuse of treated wastewater from <b>3.10 BCM in 2011</b> to 5.5 BCM. (CEDARE 2030 Reuse Vision)
17	By 2030, increase <u>indirect</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)
18	By 2030, increase proportion of produced agricultural drainage safely reused for agricultural purposes <b>from 44% in 2015 to 50%</b> . (MWRI 2037 Plan)
	<b>Reuse for Fresh Water Savings</b>



19	By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)
20	By 2030, 10% of groundwater allocated to Irrigation will be swapped with treated reused wastewater. (New)
21	By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New)
22	By 2030, 50% of fresh water used for landscaping in 2018 will be swapped with treated wastewater. (New)
	<b>Reduce and reuse wastewater disposal to Sea and Lakes</b>
23	By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New)
	<b>Reuse for Agriculture Development &amp; Urban Landscaping</b>
24	By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)
25	By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)

Table 7. List of local 2030 reuse targets proposed by CEDARE for this 3<sup>rd</sup> NLA meeting.

	<b>Local Proposed 2030 Water Reuse Targets</b>
	<b>Treatment and Reuse of Mixed Agriculture Drainage &amp; Wastewater</b>
1	By 2030, treat and (indirectly/directly) reuse 1.83 BCM/y of mixed agriculture drainage and wastewater from Bahr El Baqr drain for 365,000 feddans of agriculture in North Sinai
2	By 2030, treat and (indirectly/directly) reuse 0.365 BCM/y of mixed agriculture drainage and wastewater from Mahsama drain for 73,000 feddans of agriculture in North Sinai
	<b>Swap Non-Renewable Groundwater with Direct Treated Wastewater Reuse</b>
3	By 2030, swap 0.9 BCM/y of allocated nonrenewable groundwater with direct treated wastewater for 180,000 feddans of agriculture lands within the 1.5 million feddans project and save fresh groundwater for drinking purposes
4	By 2030, swap 0.7 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 140,000 feddans of agriculture lands in West Menya & West West Menia within the 1.5 million feddans project
5	By 2030, swap 0.10 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 20,000 feddans of agriculture lands in El-Marashda, Qena within the 1.5 million feddans project
6	By 2030, swap 0.060 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 12,000 feddans of agriculture lands in West Kom Ombo, Aswan within the 1.5 million feddans project
7	By 2030, swap 0.04 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 8,000 feddans of agriculture lands in El-Tor, South Sinai within the 1.5 million feddans project
	<b>Supplement Depleted Groundwater with Treated Reused Water</b>
8	By 2030, supplement depleted groundwater with 0.7 BCM/y of treated wastewater for direct reuse for the priority areas of 144,000 feddans in the West Delta agriculture project
	<b>WW Reuse for New Cities Landscaping &amp; Neighboring Agriculture</b>
9	By 2030, direct 0.25 BCM/y of treated wastewater generated from the New Administrative City to 5000 feddans of Landscaping within the City and about 30,000 feddans of neighboring agriculture areas.

## Appendix C. Presentation prepared by Dr. Khaled AbuZeid



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برنامج إدارة الموارد المائية  
Water Resources Management Programme



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Water Resources Management Programme

# **“TOWARDS EGYPT 2030 SHARED STRATEGY FOR WATER REUSE”**

## **REWater NATIONAL LEARNING ALLIANCE CONSULTATION DIALOGUE**

### **EGYPT WASTEWATER & WATER REUSE 2030 TARGETS**

October 14, 2020  
9:30 AM - 01:00 PM (Cairo local time)

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# Egypt Wastewater & Water Reuse, 2030 Projections & Preliminary Proposed Targets

Khaled M. AbuZeid, PhD, PE, PMP  
Senior Regional Water Director (CEDARE)

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## 2030 Reuse Strategy Methodology



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## Methodology



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## Wastewater Treatment (2018)



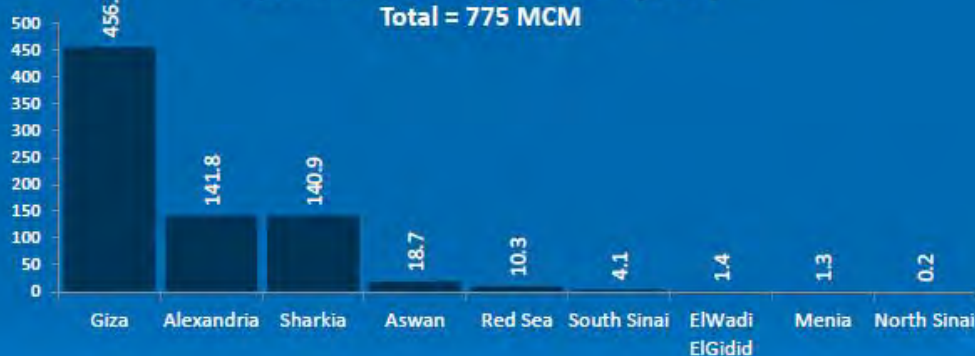
CAPMAS, 2017-2018

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## Primary Treatment (2018)

Quantities of Primary Treatment (MCM)

Total = 775 MCM

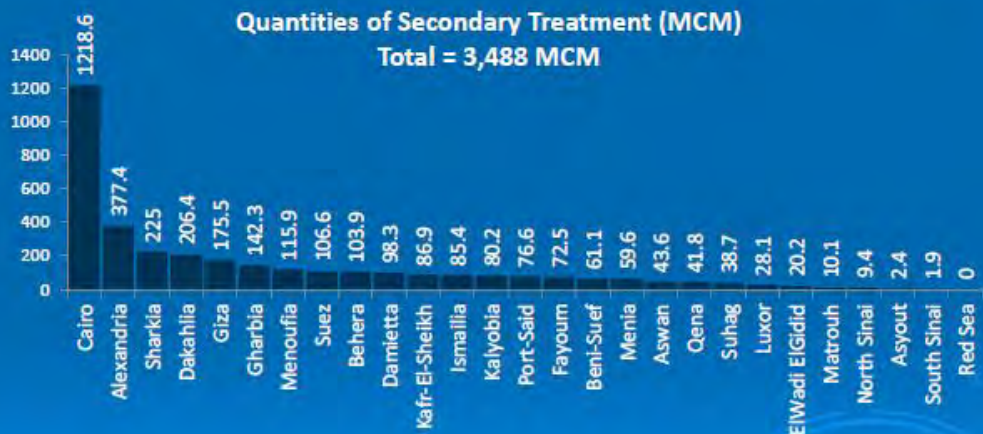


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## Secondary Treatment (2018)

Quantities of Secondary Treatment (MCM)

Total = 3,488 MCM

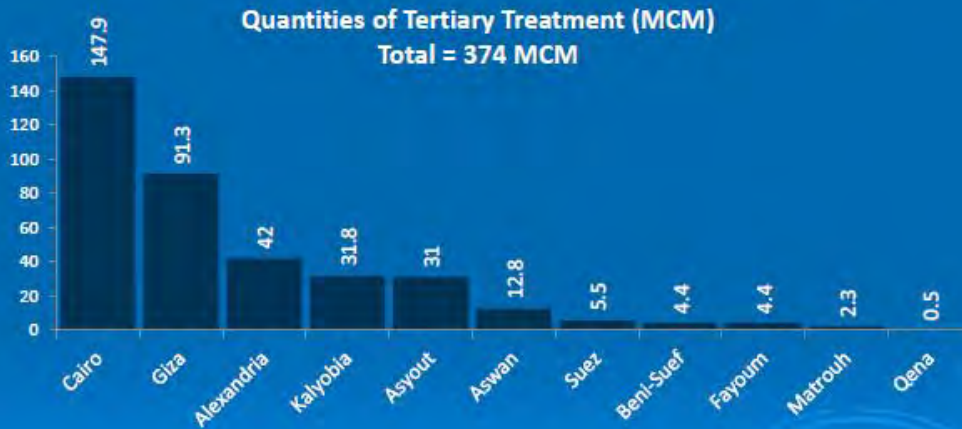


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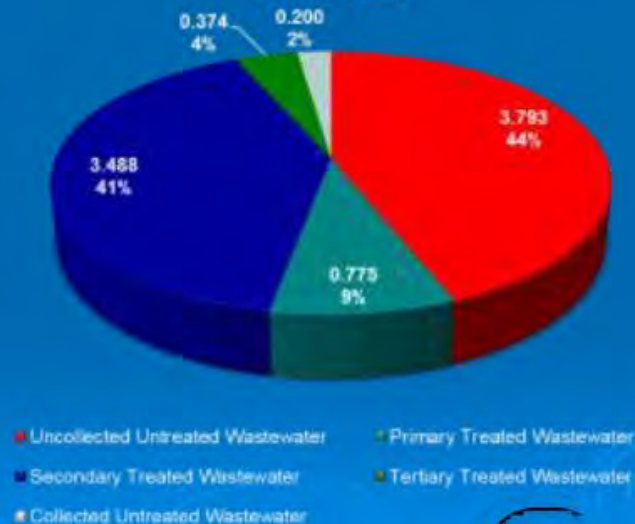
## Tertiary Treatment (2018)



CAPMAS, 2017-2018

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## 2018 Produced Wastewater 8.63 BCM/Year



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## Wastewater & Reuse in 2018



Source: Prepared by CEDARE

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## 2030 Projections

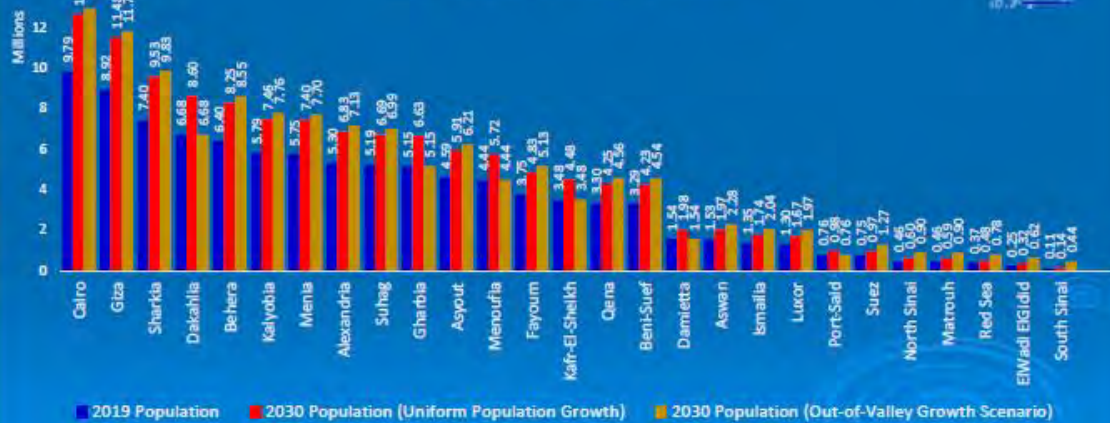
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## 2030 Population Projections

2030 Egypt population projection

2019 Total Population: 98 Million

2030 Projected Population: 126 Million



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## 2030 Forecasted Growth

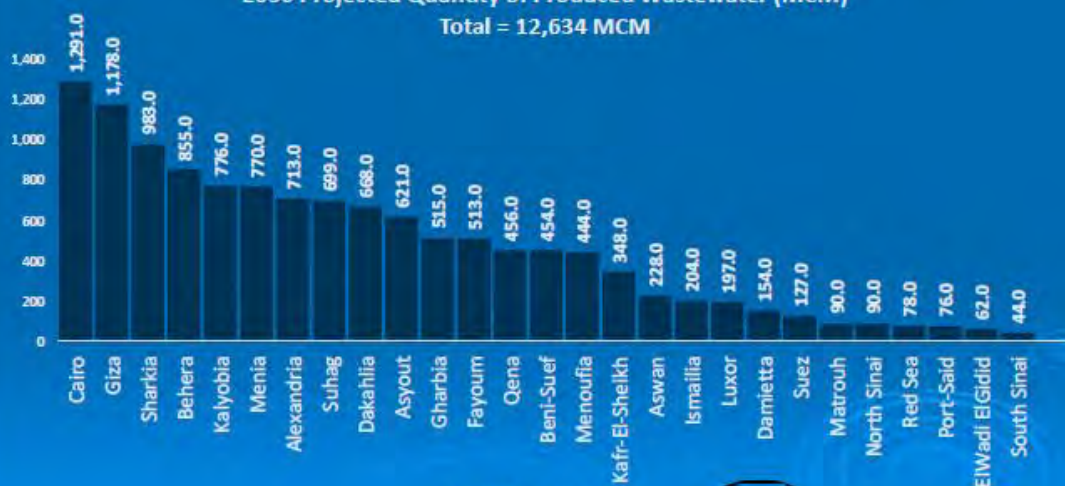


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## 2030 Produced Wastewater (Out of Valley Scenario)

2030 Projected Quantity of Produced Wastewater (MCM)

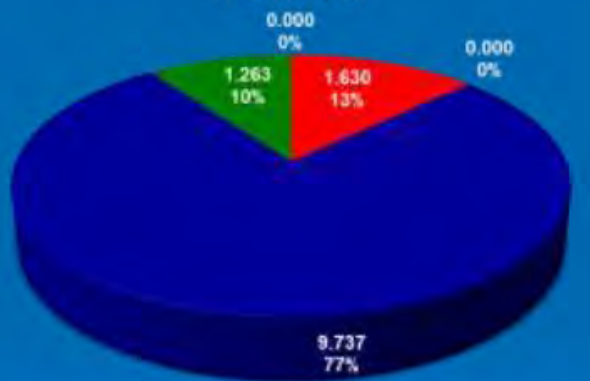
Total = 12,634 MCM



CAPMAS, 2017-2018

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## 2030 Produced Wastewater 12.63 BCM/Year



- Uncollected Untreated Wastewater
- Primary Treated Wastewater
- Secondary Treated Wastewater
- Tertiary Treated Wastewater
- Collected Untreated Wastewater

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## Wastewater & Reuse Projections for 2030



Source: Prepared by CEDARE

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## Wastewater Reuse Targets

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National  
Targets

Local  
Targets

Wastewater  
Reuse  
Targets

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# National Targets

## REVIEW OF CURRENT VISIONS, STRATEGIES & PLANS

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## Wastewater & Reuse Targets from Existing Visions, Strategies & Plans

### 2030 UN Sustainable Development Goal 6 (SDG 6)

- 1 SDG Target 6.2.1.a: By 2030, Achieve access to adequate and equitable & safely managed sanitation for all.  
(A safely managed sanitation facility is one where excreta is safely disposed of in situ or treated off-site.)
- 2 SDG Target 6.3.1.a: By 2030, Halving the proportion of untreated (and unsafely treated) domestic and industrial wastewater
- 3 SDG Target 6.3.1.b: By 2030, Substantially increasing recycling and safe reuse globally.

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## Wastewater & Reuse Targets from Existing Visions, Strategies & Plans

### Egypt Sustainable Development Strategy (SDS) 2030 Vision

- 4 By 2030, Increase the share of non-conventional water resources to the total water resources used from 20% in 2017 to 40%
- 5 By 2030, Increase the share of treated wastewater to total generated wastewater from 50% in 2017 to 80%
- 6 By 2030, Decrease the share of disposed non-compliant industrial wastewater along the Nile to total disposed industrial wastewater from 21% in 2017 to 0%
- 7 By 2030, Increase the share of domestic wastewater meeting standards to the Nile River from 50% in 2017 to 100%

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## Wastewater & Reuse Targets from Existing Visions, Strategies & Plans

### MWRI for Sustainable Development Strategy (SDS) 2030 Vision

- |    |   |
|----|---|
| 8  | By 2030, Increase non-conventional water resources used as a percentage of total used water resources from 26% in 2017 to 28%                     |
| 9  | By 2030, Increase treated domestic wastewater from 4 BCM in 2017 to 10.2 BCM  |
| 10 | By 2030, Increase agriculture drainage & domestic wastewater mixed with fresh water for irrigation (Indirect Use) from 13.5 BCM in 2017 to 16 BCM |

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## Wastewater & Reuse Targets from Existing Visions, Strategies & Plans

### The National Water Resources Plan 2017-2030-2037 (MWRI 7/2017)

- |    |  |
|----|--|
| 11 | By 2037, 50% of the agricultural drainage flow will be safely reused for agricultural purposes |
|----|--|

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## Wastewater & Reuse Targets from Existing Visions, Strategies & Plans

### Reuse of Domestic & Agricultural Wastewater Roadmap (2017)

12	Modify National Strategies, Plans, Laws (up to 2 years)
----	---

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## Wastewater & Reuse Targets from Existing Visions, Strategies & Plans

### 2030 Strategic Vision for Treated Wastewater Reuse

- |    |   |
|----|---|
| 13 | By 2030, Upgrade 0.9 BCM of primary treated wastewater in 2011 to secondary treatment.  |
| 14 | By 2030, Eliminate all untreated wastewater (treat by secondary treatment)  |
| 15 | By 2030, Increase the amount of secondary treated wastewater (domestic and industrial) from 2.42 BCM in 2011 to 11.61 BCM               |
| 16 | By 2030, Continue to operate the tertiary treatment (domestic and industrial) facilities without building new tertiary treatment plants |
| 17 | By 2030, Increase direct reuse of treated wastewater from 0.27 BCM in 2011 to 5.82 BCM  |
| 18 | By 2030, Increase Indirect reuse of treated wastewater from 3.10 BCM in 2011 to 5.53 BCM  |

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# Proposed National 2030 Reuse Targets

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## Proposed National 2030 Reuse Targets CATEGORIES

Sanitation Coverage for Planned Reuse

Mixed Industrial and Domestic Wastewater Reuse

Clean Water Bodies for Indirect Reuse

Level of Wastewater Treatment for Appropriate Reuse

Increase of Reuse

Reuse for Fresh Water Savings

Reduce and reuse wastewater disposal to Sea and Lakes

Reuse for Agriculture Development & Urban Landscaping

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## Sanitation Coverage for Planned Reuse

- 1 By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta is safely disposed of in situ or treated off-site.  
(UN SDG 6.2.1.a)

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## Mixed Industrial and Domestic Wastewater Reuse

- 2 By 2030, halve the proportion of untreated (and unsafely treated) Domestic and Industrial wastewater produced from 60% in 2015 to 30%, and ensure that at least 70% of the produced wastewater is safely treated.  
(UN SDG 6.3.1.a)
- 3 By 2030, eliminate disposed non-compliant industrial wastewater to the wastewater network.  
(New)

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### Clean Water Bodies for Indirect Reuse

- |   |  |
|---|--|
| 4 | By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision) |
| 5 | By 2030, eliminate disposed non-compliant industrial wastewater into the Nile from 21% of total disposed industrial wastewater into the Nile in 2017. (Egypt SDS 2030 Vision)                  |
| 6 | By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)   |

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### Level of Wastewater Treatment for Appropriate Reuse

- |   |  |
|---|--|
| 7 | By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)         |
| 8 | By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision) |
| 9 | By 2030, increase the proportion of tertiary treated wastewater to reach 10% of produced domestic wastewater. (New)  |

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### Increase of Reuse

10	By 2030, increase the proportion of non conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)
11	By 2030, increase the ratio of non conventional water resources used to the conventional water resources used from 36% in 2015 to 45%. (New)
12	By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)
13	By 2030, increase <u>direct</u> reuse of treated wastewater from 0.27 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)
14	By 2030, increase <u>direct</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)

Cont.

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### Increase of Reuse (cont.)

15	By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)
16	By 2030, increase <u>indirect</u> reuse of treated wastewater from 3.10 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)
17	By 2030, increase <u>indirect</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)
18	By 2030, increase proportion of produced agricultural drainage safely reused for agricultural purposes from 44% in 2015 to 50%. (MWRI 2037 Plan)

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## Reuse for Fresh Water Savings

- |    |   |
|----|---|
| 19 | By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)              |
| 20 | By 2030, 10% of groundwater allocated to Irrigation will be swapped with treated reused wastewater. (New)             |
| 21 | By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New) |
| 22 | By 2030, 50% of fresh water used for landscaping in 2018 will be swapped with treated wastewater. (New)               |

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## Reduce and reuse wastewater disposal to Sea and Lakes

- |    |  |
|----|--|
| 23 | By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New) |
|----|--|

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## Reuse for Agriculture Development & Urban Landscaping

24	By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)
25	By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)

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## Proposed Local 2030 Water Reuse Targets

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## Proposed Local 2030 Water Reuse Targets **CATEGORIES**

Treatment and Reuse of Mixed Agriculture Drainage & Wastewater

Swap Non-Renewable Groundwater with Direct Treated Wastewater Reuse

Supplement Depleted Groundwater with Treated Reused Water

WW Reuse for New Cities Landscaping & Neighboring Agriculture

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### **Treatment and Reuse of Mixed Agriculture Drainage & Wastewater**

- |   |  |
|---|--|
| 1 | By 2030, treat and (indirectly/directly) reuse 1.83 BCM/y of mixed agriculture drainage and wastewater from Bahr El Baqr drain for 365,000 feddans of agriculture in North Sinai |
| 2 | By 2030, treat and (indirectly/directly) reuse 0.365 BCM/y of mixed agriculture drainage and wastewater from Mahsama drain for 73,000 feddans of agriculture in North Sinai      |

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## Demonstration Local Target: Bahr El Baqr Mixed Wastewater Plant



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### Bahr ElBaqr Drainage Treatment and Reuse Project

Reuse of 5 MCM/day (1.8 BCM/year) of drainage water from Bahr Elbaqr drain through Sheikh Jaber Canal, east of the Suez Canal



The works include the diversion of the drain's path and other engineering works to install crossings, gates and links between drains, to construct an advanced treatment plant east of the Suez canal to ensure the quality of the water used in agriculture.

Reuse of both Bahr ElBaqr and Tard drainage water by gravity flow to reclaim 70,000 feddans, in addition to the approximately 310,000 feddans east of the Suez Canal, currently being cultivated in the "Sahl Elttina" and "Qantara Sharq" regions.

1.8 BCM/y → 365,000 feddans

**The Total Cultivated Land Reaches 380 Thousand Feddans**

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## Demonstration Local Target: Mahsama Mixed WW Treatment Plant



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## Demonstration of Local Target: Mahsama Mixed Wastewater Treatment Plant



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## Mahsamah Drainage Treatment and Reuse Project

Collection, treatment and transport of approximately 1 MCM/day of drainage water from west to east side of Suez Canal



Gates, syphons, and connections between the drains to convey drainage water after treatment according to standards of mixing agriculture drainage with freshwater in coordination with the Ministry of Water Resources and Irrigation.

1 million m<sup>3</sup>/day =  
0.365 BCM/y  
→ 70,000 feddans

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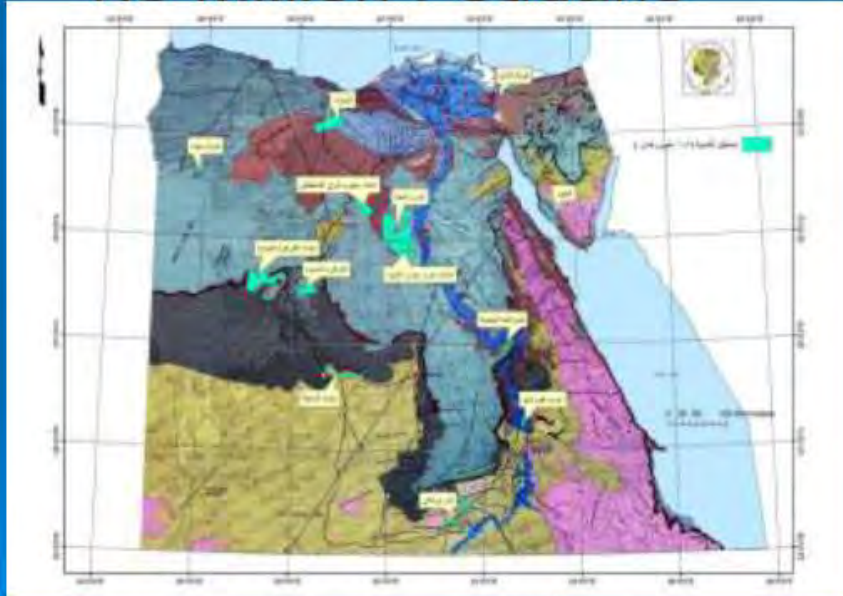
## Swap Non-Renewable Groundwater with Direct Treated Wastewater Reuse

- 3 By 2030, swap 0.9 BCM/y of allocated non renewable groundwater with direct treated wastewater for 180,000 feddans of agriculture lands within the 1.5 million feddans project and save fresh groundwater for drinking purposes
- 4 By 2030, swap 0.7 BCM/y of allocated non renewable fresh groundwater with direct treated wastewater for 140,000 feddans of agriculture lands in West Menya & West West Menya within the 1.5 million feddans project
- 5 By 2030, swap 0.10 BCM/y of allocated non renewable fresh groundwater with direct treated wastewater for 20,000 feddans of agriculture lands in El-Marashda, Qena within the 1.5 million feddans project
- 6 By 2030, swap 0.060 BCM/y of allocated non renewable fresh groundwater with direct treated wastewater for 12,000 feddans of agriculture lands in West Kom Ombo, Aswan within the 1.5 million feddans project
- 7 By 2030, swap 0.04 BCM/y of allocated non renewable fresh groundwater with direct treated wastewater for 8,000 feddans of agriculture lands in El-Tor, South Sinai within the 1.5 million feddans project

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# 1.5 Million Feddans



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## Local Target: West West Menya, Menya



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## Local Target: West Menya, Menya



250,000 feddans

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## Local Target: West Menya & West West Menya, Menya



Total: 620,000 feddans

Area for WW available:  
140,000 feddans

WW available: 0.7 BCM/y

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## Local Target: El-Marashda, Qena



Total: 43,500 feddans

Area for WW available:  
20,000 feddans

WW available: 0.10 BCM/y

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## Local Target: W. Kom Ombo, Aswan



Total: 25,000 feddans

Area for WW available:  
12,000 feddans

WW available: 0.060 BCM/y

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## Local Target: El-Tor, South Sinai



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### Supplement Depleted Groundwater with Treated Reused Water

- 8 By 2030, supplement depleted groundwater with 0.7 BCM/y of treated wastewater for direct reuse for the priority areas of 144,000 feddans in the West Delta agriculture project

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# West Delta Project

## West Delta Project

Write a description for your map.

Total: 180,000 feddans,  
144,000 feddans priority

Area for WW available:  
144,000 feddans

WW available: 0.7 BCM/y =  
0.5 BCM/y AbuRawash, 0.2 BCM/Y Growth

Legend  
Wastewater Treatment Plants  
West Delta Project Extent  
West Delta Project Extent: Priority Section

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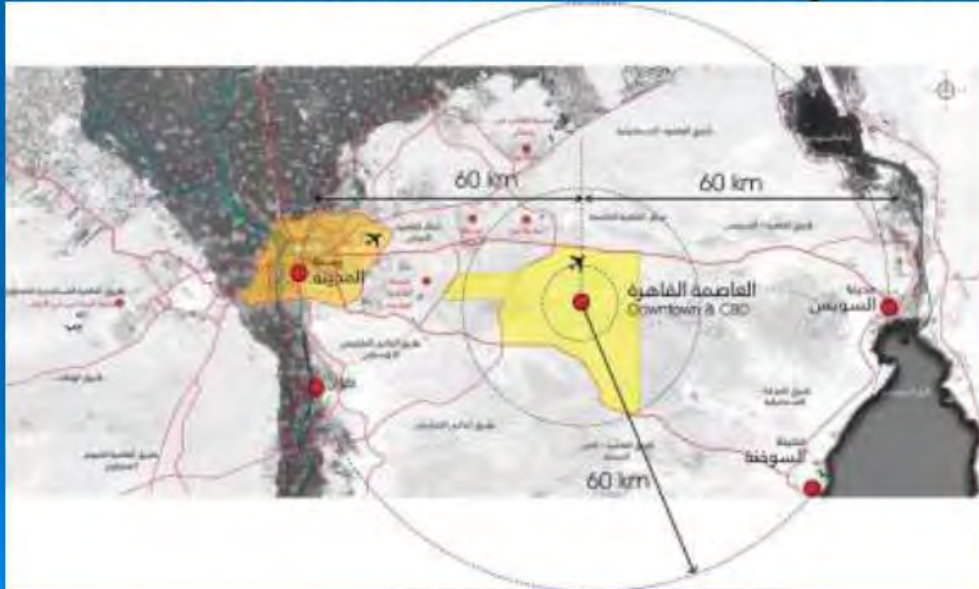
## WW Reuse for New Cities Landscaping & Neighboring Agriculture

9 By 2030, direct 0.25 BCM/y of treated wastewater generated from the New Administrative City to 5000 feddans of Landscaping within the City and about 30,000 feddans of neighboring agriculture areas.

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## New Administrative Capital



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## New Administrative Capital

Total: 40,000 feddans

Area for WW available:  
5,000 feddans landscaping  
30,000 feddans agriculture  
WW available: 0.25 BCM/y



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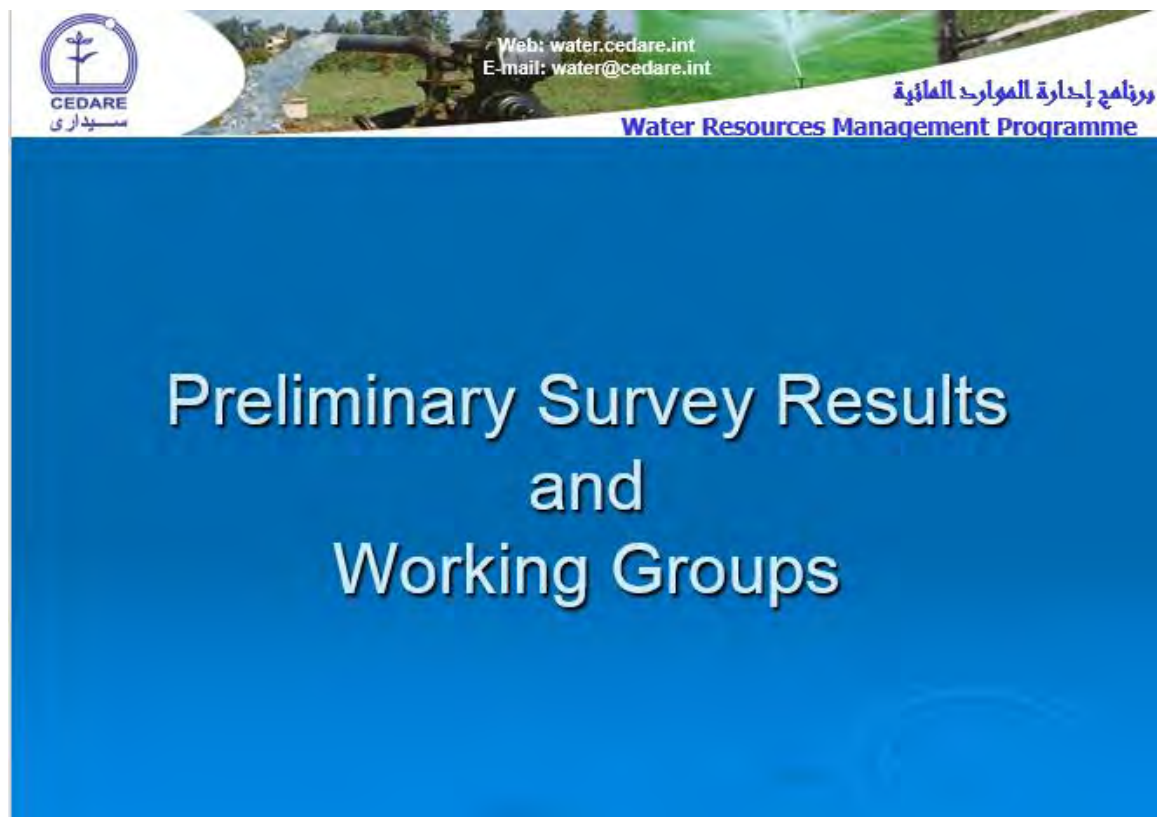
برنامج إدارة الموارد المائية

Water Resources Management Programme

# Thank You

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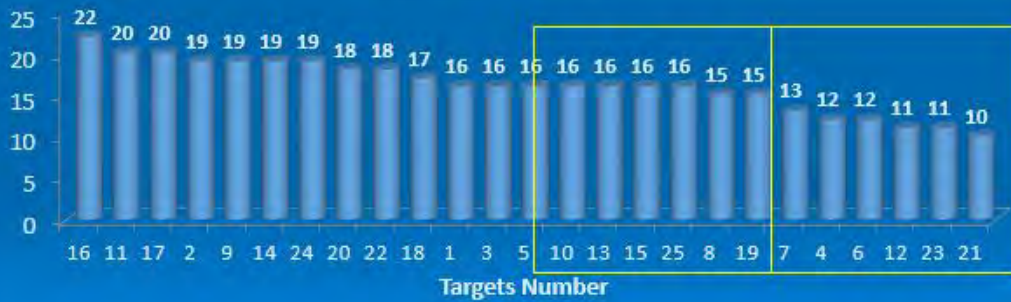
## Appendix D. Preliminary Results of the Survey on Proposed Reuse Targets prepared by Eng. Mona ElAgizy





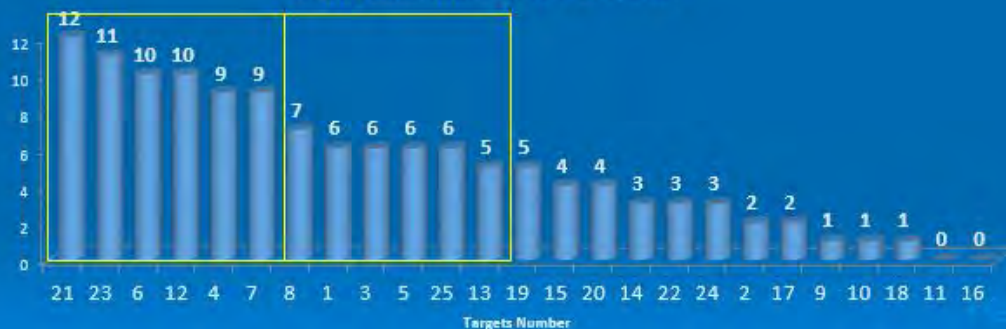
## National Survey: 22 Responses

### Realistic & Feasible



## National Survey: 22 Responses

### Highly Ambitious & Not Feasible





## National Survey: 22 Responses

Not Ambitious Enough



## National Survey: Working Groups

➤ Group 1

Clean Water Bodies for Indirect Reuse	
	4
	6
Level of Wastewater Treatment for Appropriate Reuse	
	7
	8
Reduce and reuse wastewater disposal to Sea and Lakes	
	23
	25

➤ Group 2

Increase of Reuse	
	10
	12
	13
	15
Reuse for Fresh Water Savings	
	19
	21

## Local Targets 11 Responses for 9 Questions



## Local Targets 11 Responses for 9 Questions



## Local Targets 11 Responses for 9 Questions




## Local Targets Working Group

➤ Group 3

1
3
4
5





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E-mail: water@cedare.int

برنامج إدارة الموارد المائية  
Water Resources Management Programme

### Objective

- to produce high quality targets that are agreed upon
- targets that have consensus, do not need to be worked on
- targets that are too ambitious or not ambitious enough should be review
- Select high priority topics to work on as a group
- Those target that were not discussed in the meeting
- The group should propose new wording to clarify or raise points that needs to be taken into consideration when relooking at the target.

## Appendix E. Final Results of the Survey on Proposed Reuse Targets

### National Targets

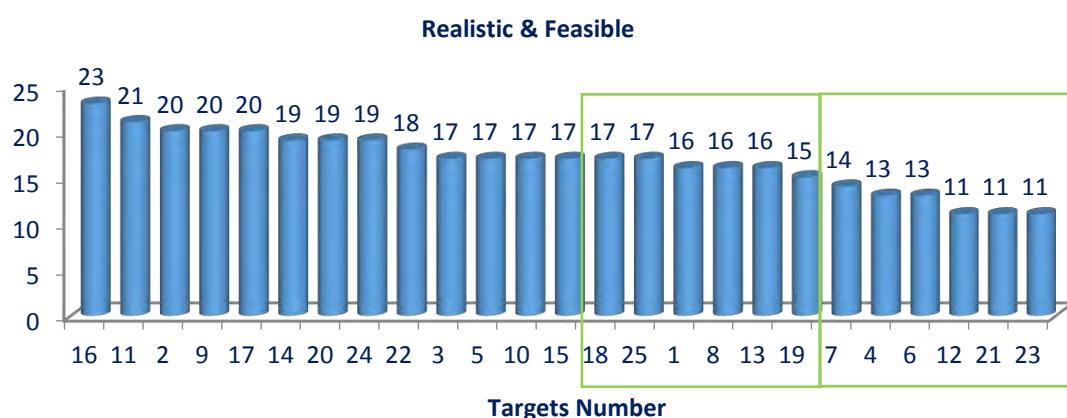
	<u>National Proposed 2030 Reuse Targets</u>	<u>Realistic &amp; Feasible</u>
	<b>Sanitation Coverage for Planned Reuse</b>	<b>Scores</b>
1	By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta is safely disposed of in situ or treated off-site. (UN SDG 6.2.1.a)	16
	<b>Mixed Industrial and Domestic Wastewater Reuse</b>	
2	By 2030, halve the proportion of untreated (and unsafely treated) Domestic and Industrial wastewater produced from 60% in 2015 to 30%, and ensure that at least 70% of the produced wastewater is safely treated. (UN SDG 6.3.1.a)	20
3	By 2030, eliminate disposed non-compliant industrial wastewater to the wastewater network. (New)	17
	<b>Clean Water Bodies for Indirect Reuse</b>	
4	By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision)	13
5	By 2030, eliminate disposed non-compliant industrial wastewater into the Nile from 21% of total disposed industrial wastewater into the Nile in 2017. (Egypt SDS 2030 Vision)	17

6	By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)	13
	<b>Level of Wastewater Treatment for Appropriate Reuse</b>	
7	By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)	14
8	By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision)	16
9	By 2030, increase the proportion of tertiary treated wastewater to reach 10% of produced domestic wastewater. (New)	20
	<b>Increase of Reuse</b>	
10	By 2030, increase the proportion of non-conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)	17
11	By 2030, increase the ratio of non-conventional water resources used to the conventional water resources used from 36% in 2015 to 45%. (New)	21
12	By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)	11
13	By 2030, increase <u>direct</u> reuse of treated wastewater from 0.27 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)	16
14	By 2030, increase <u>direct</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	19
15	By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)	17
16	By 2030, increase <u>indirect</u> reuse of treated wastewater from 3.10 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)	23
17	By 2030, increase <u>indirect</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	20
18	By 2030, increase proportion of produced agricultural drainage safely reused for agricultural purposes from 44% in 2015 to 50%. (MWRI 2037 Plan)	17
	<b>Reuse for Fresh Water Savings</b>	
19	By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)	15
20	By 2030, 10% of groundwater allocated to Irrigation will be swapped with treated reused wastewater. (New)	19
21	By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New)	11
22	By 2030, 50% of fresh water used for landscaping in 2018 will be swapped with treated wastewater. (New)	18
	<b>Reduce and reuse wastewater disposal to Sea and Lakes</b>	
23	By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New)	11
	<b>Reuse for Agriculture Development &amp; Urban Landscaping</b>	
24	By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)	19
25	By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)	17

Rank	Target Number	National Proposed 2030 Reuse Targets	Realistic & Feasible (Scores)
1	16	By 2030, increase <u>indirect</u> reuse of treated wastewater from <b>3.10 BCM in 2011</b> to 5.5 BCM. (CEDARE 2030 Reuse Vision)	23
2	11	By 2030, increase the ratio of non-conventional water resources used to the conventional water resources used from <b>36% in 2015</b> to 45%. (New)	21
3	2	By 2030, halve the proportion of untreated (and unsafely treated) Domestic and Industrial wastewater produced from 60% in 2015 to 30%, and ensure that at least 70% of the produced wastewater is safely treated. (UN SDG 6.3.1.a)	20
4	9	By 2030, increase the proportion of tertiary treated wastewater to reach 10% of produced domestic wastewater. (New)	20
5	17	By 2030, increase <u>indirect</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	20
6	14	By 2030, increase <u>direct</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	19
7	20	By 2030, 10% of groundwater allocated to Irrigation will be swapped with treated reused wastewater. (New)	19
8	24	By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)	19
9	22	By 2030, 50% of fresh water used for landscaping in 2018 will be swapped with treated wastewater. (New)	18
10	3	By 2030, eliminate disposed non-compliant industrial wastewater to the wastewater network. (New)	17
11	5	By 2030, eliminate disposed non-compliant industrial wastewater into the Nile from 21% of total disposed industrial wastewater into the Nile in 2017. (Egypt SDS 2030 Vision)	17
12	10	By 2030, increase the proportion of non-conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)	17
13	15	By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)	17
14	18	By 2030, increase proportion of produced agricultural drainage safely reused for agricultural purposes <b>from 44% in 2015 to 50%</b> . (MWRI 2037 Plan)	17
15	25	By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)	17
16	1	By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta are safely disposed of in situ or treated off-site. (UN SDG 6.2.1.a)	16
17	8	By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision)	16



18	13	By 2030, increase <u>direct</u> reuse of treated wastewater from <b>0.27 BCM in 2011</b> to 5.5 BCM. (CEDARE 2030 Reuse Vision)	16
19	19	By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)	15
20	7	By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)	14
21	4	By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision)	13
22	6	By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)	13
23	12	By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)	11
24	21	By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New)	11
25	23	By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New)	11



	<b><u>National Proposed 2030 Reuse Targets</u></b>	<b><u>Highly Ambitious &amp; Not Feasible</u></b>
	<b>Sanitation Coverage for Planned Reuse</b>	<b>Scores</b>
1	By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta is safely disposed of in situ or treated off-site. (UN SDG 6.2.1.a)	7
	<b>Mixed Industrial and Domestic Wastewater Reuse</b>	
2	By 2030, halve the proportion of untreated (and unsafely treated) Domestic and Industrial wastewater produced from 60% in 2015 to 30%, and ensure that at least 70% of the produced wastewater is safely treated. (UN SDG 6.3.1.a)	2
3	By 2030, eliminate disposed non-compliant industrial wastewater to the wastewater network. (New)	6
	<b>Clean Water Bodies for Indirect Reuse</b>	
4	By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision)	9

5	By 2030, eliminate disposed non-compliant industrial wastewater into the Nile from 21% of total disposed industrial wastewater into the Nile in 2017. (Egypt SDS 2030 Vision)	6
6	By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)	10
<b>Level of Wastewater Treatment for Appropriate Reuse</b>		
7	By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)	9
8	By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision)	7
9	By 2030, increase the proportion of tertiary treated wastewater to reach 10% of produced domestic wastewater. (New)	1
<b>Increase of Reuse</b>		
10	By 2030, increase the proportion of non-conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)	1
11	By 2030, increase the ratio of non-conventional water resources used to the conventional water resources used from 36% in 2015 to 45%. (New)	0
12	By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)	10
13	By 2030, increase <u>direct</u> reuse of treated wastewater from 0.27 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)	5
14	By 2030, increase <u>direct</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	3
15	By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)	4
16	By 2030, increase <u>indirect</u> reuse of treated wastewater from 3.10 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)	0
17	By 2030, increase <u>indirect</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	2
18	By 2030, increase proportion of produced agricultural drainage safely reused for agricultural purposes from 44% in 2015 to 50%. (MWRI 2037 Plan)	1
<b>Reuse for Fresh Water Savings</b>		
19	By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)	5
20	By 2030, 10% of groundwater allocated to Irrigation will be swapped with treated reused wastewater. (New)	4
21	By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New)	12
22	By 2030, 50% of fresh water used for landscaping in 2018 will be swapped with treated wastewater. (New)	3
<b>Reduce and reuse wastewater disposal to Sea and Lakes</b>		
23	By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New)	12
<b>Reuse for Agriculture Development &amp; Urban Landscaping</b>		
24	By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)	3

25	By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)	6
----	---	---

Rank	Target Number	National Proposed 2030 Reuse Targets	Highly Ambitious & Not Feasible (Scores)
1	21	By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New)	12
2	23	By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New)	12
3	6	By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)	10
4	12	By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)	10
5	4	By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision)	9
6	7	By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)	9
7	1	By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta is safely disposed of in situ or treated off-site. (UN SDG 6.2.1.a)	7
8	8	By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision)	7
9	3	By 2030, eliminate disposed non-compliant industrial wastewater to the wastewater network. (New)	6
10	5	By 2030, eliminate disposed non-compliant industrial wastewater into the Nile from 21% of total disposed industrial wastewater into the Nile in 2017. (Egypt SDS 2030 Vision)	6
11	25	By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)	6
12	13	By 2030, increase <u>direct</u> reuse of treated wastewater from 0.27 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)	5
13	19	By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)	5
14	15	By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)	4
15	20	By 2030, 10% of groundwater allocated to Irrigation will be swapped with treated reused wastewater. (New)	4



16	14	By 2030, increase <u>direct</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	3
17	22	By 2030, 50% of fresh water used for landscaping in 2018 will be swapped with treated wastewater. (New)	3
18	24	By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)	3
19	2	By 2030, halve the proportion of untreated (and unsafely treated) Domestic and Industrial wastewater produced from 60% in 2015 to 30%, and ensure that at least 70% of the produced wastewater is safely treated. (UN SDG 6.3.1.a)	2
20	17	By 2030, increase <u>indirect</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	2
21	9	By 2030, increase the proportion of tertiary treated wastewater to reach 10% of produced domestic wastewater. (New)	1
22	10	By 2030, increase the proportion of non-conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)	1
23	18	By 2030, increase proportion of produced agricultural drainage safely reused for agricultural purposes <b>from 44% in 2015 to 50%</b> . (MWRI 2037 Plan)	1
24	11	By 2030, increase the ratio of non-conventional water resources used to the conventional water resources used from <b>36% in 2015</b> to 45%. (New)	0
25	16	By 2030, increase <u>indirect</u> reuse of treated wastewater from <b>3.10 BCM in 2011</b> to 5.5 BCM. (CEDARE 2030 Reuse Vision)	0



	<b><u>National Proposed 2030 Reuse Targets</u></b>	<b><u>Not Ambitious Enough</u></b>
	<b>Sanitation Coverage for Planned Reuse</b>	<b>Scores</b>
1	By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta is safely disposed of in situ or treated off-site. (UN SDG 6.2.1.a)	0

	<b>Mixed Industrial and Domestic Wastewater Reuse</b>	
2	By 2030, halve the proportion of untreated (and unsafely treated) Domestic and Industrial wastewater produced from 60% in 2015 to 30%, and ensure that at least 70% of the produced wastewater is safely treated. (UN SDG 6.3.1.a)	1
3	By 2030, eliminate disposed non-compliant industrial wastewater to the wastewater network. (New)	0
	<b>Clean Water Bodies for Indirect Reuse</b>	
4	By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision)	1
5	By 2030, eliminate disposed non-compliant industrial wastewater into the Nile from 21% of total disposed industrial wastewater into the Nile in 2017. (Egypt SDS 2030 Vision)	0
6	By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)	0
	<b>Level of Wastewater Treatment for Appropriate Reuse</b>	
7	By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)	0
8	By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision)	0
9	By 2030, increase the proportion of tertiary treated wastewater to reach 10% of produced domestic wastewater. (New)	2
	<b>Increase of Reuse</b>	
10	By 2030, increase the proportion of non-conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)	5
11	By 2030, increase the ratio of non-conventional water resources used to the conventional water resources used from 36% in 2015 to 45%. (New)	2
12	By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)	2
13	By 2030, increase <u>direct</u> reuse of treated wastewater from 0.27 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)	2
14	By 2030, increase <u>direct</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	1
15	By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)	2
16	By 2030, increase <u>indirect</u> reuse of treated wastewater from 3.10 BCM in 2011 to 5.5 BCM. (CEDARE 2030 Reuse Vision)	0
17	By 2030, increase <u>indirect</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	1
18	By 2030, increase proportion of produced agricultural drainage safely reused for agricultural purposes from 44% in 2015 to 50%. (MWRI 2037 Plan)	5
	<b>Reuse for Fresh Water Savings</b>	
19	By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)	3
20	By 2030, 10% of groundwater allocated to Irrigation will be swapped with treated reused wastewater. (New)	0
21	By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New)	0

22	By 2030, 50% of fresh water used for landscaping in 2018 will be swapped with treated wastewater. (New)	2
<b>Reduce and reuse wastewater disposal to Sea and Lakes</b>		
23	By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New)	0
<b>Reuse for Agriculture Development &amp; Urban Landscaping</b>		
24	By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)	1
25	By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)	0

Rank	Target Number	National Proposed 2030 Reuse Targets	Not Ambitious Enough (Scores)
1	10	By 2030, increase the proportion of non-conventional water resources used to the total water resources used from 26% in 2017 to 28%. (MWRI for SDS 2030 Vision)	5
2	18	By 2030, increase proportion of produced agricultural drainage safely reused for agricultural purposes <b>from 44% in 2015 to 50%</b> . (MWRI 2037 Plan)	5
3	19	By 2030, 20% of Nile water allocated to Irrigation will be swapped with treated reused wastewater. (New)	3
4	9	By 2030, increase the proportion of tertiary treated wastewater to reach 10% of produced domestic wastewater. (New)	2
5	11	By 2030, increase the ratio of non-conventional water resources used to the conventional water resources used from <b>36% in 2015</b> to 45%. (New)	2
6	12	By 2030, treated and reuse 100% of collectable produced wastewater. (UN SDG 6.3.1.b)	2
7	13	By 2030, increase <u>direct</u> reuse of treated wastewater from <b>0.27 BCM in 2011</b> to 5.5 BCM. (CEDARE 2030 Reuse Vision)	2
8	15	By 2030, increase <u>indirect</u> reuse of agriculture drainage & treated domestic wastewater mixed with fresh water for irrigation from 13.5 BCM in 2017 to 16 BCM. (MWRI for SDS 2030 Vision)	2
9	22	By 2030, 50% of fresh water used for landscaping in 2018 will be swapped with treated wastewater. (New)	2
10	2	By 2030, halve the proportion of untreated (and unsafely treated) Domestic and Industrial wastewater produced from 60% in 2015 to 30%, and ensure that at least 70% of the produced wastewater is safely treated. (UN SDG 6.3.1.a)	1
11	4	By 2030, increase the proportion of compliant domestic wastewater disposed into the Nile from 50% of total disposed domestic wastewater into the Nile in 2017 to 100%. (Egypt SDS 2030 Vision)	1
12	14	By 2030, increase <u>direct</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	1



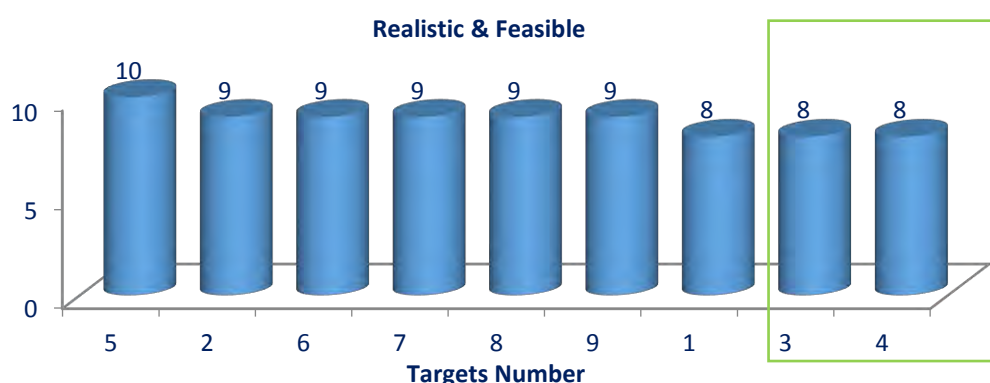
13	17	By 2030, increase <u>indirect</u> reuse of treated wastewater to 50% of collectable produced wastewater. (New)	1
14	24	By 2030, 20% of treated wastewater would be directly reused for 300,000 feddans of urban landscaping. (New)	1
15	1	By 2030, increase access to adequate, equitable & safely managed sanitation from 51% of population in 2015 to 100%, where all excreta are safely disposed of in situ or treated off-site. (UN SDG 6.2.1.a)	0
16	3	By 2030, eliminate disposed non-compliant industrial wastewater to the wastewater network. (New)	0
17	5	By 2030, eliminate disposed non-compliant industrial wastewater into the Nile from 21% of total disposed industrial wastewater into the Nile in 2017. (Egypt SDS 2030 Vision)	0
18	6	By 2030, eliminate disposed non-compliant industrial wastewater to all water bodies. (New)	0
19	7	By 2030, all domestic wastewater will be treated by at least secondary treatment. (CEDARE 2030 Reuse Vision)	0
20	8	By 2030, eliminate all untreated domestic wastewater, using at least secondary treatment. (CEDARE 2030 Reuse Vision)	0
21	16	By 2030, increase <u>indirect</u> reuse of treated wastewater from <b>3.10 BCM in 2011</b> to 5.5 BCM. (CEDARE 2030 Reuse Vision)	0
22	20	By 2030, 10% of groundwater allocated to Irrigation will be swapped with treated reused wastewater. (New)	0
23	21	By 2030, increase the ratio of reused wastewater to the total allocated domestic water from 39% in 2015 to 80%. (New)	0
24	23	By 2030, eliminate and reuse all wastewater that used to be disposed into Mediterranean Sea and Northern Lakes through agriculture drains and Nile Branches. (New)	0
25	25	By 2030, 30% of treated wastewater would be directly reused for 600,000 feddans of agriculture Lands. (New)	0



## Local Targets

	<b>Local Proposed 2030 Water Reuse Targets</b>	<b>Realistic &amp; Feasible</b>
	<b>Treatment and Reuse of Mixed Agriculture Drainage &amp; Wastewater</b>	<b>Scores</b>
1	By 2030, treat and (indirectly/directly) reuse 1.83 BCM/y of mixed agriculture drainage and wastewater from Bahr El Baqr drain for 365,000 feddans of agriculture in North Sinai	8
2	By 2030, treat and (indirectly/directly) reuse 0.365 BCM/y of mixed agriculture drainage and wastewater from Mahsama drain for 73,000 feddans of agriculture in North Sinai	9
	<b>Swap Non-Renewable Groundwater with Direct Treated Wastewater Reuse</b>	
3	By 2030, swap 0.9 BCM/y of allocated nonrenewable groundwater with direct treated wastewater for 180,000 feddans of agriculture lands within the 1.5 million feddans project and save fresh groundwater for drinking purposes	8
4	By 2030, swap 0.7 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 140,000 feddans of agriculture lands in West Menya & West West Menia within the 1.5 million feddans project	8
5	By 2030, swap 0.10 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 20,000 feddans of agriculture lands in El-Marashda, Qena within the 1.5 million feddans project	10
6	By 2030, swap 0.060 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 12,000 feddans of agriculture lands in West Kom Ombo, Aswan within the 1.5 million feddans project	9
7	By 2030, swap 0.04 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 8,000 feddans of agriculture lands in El-Tor, South Sinai within the 1.5 million feddans project	9
	<b>Supplement Depleted Groundwater with Treated Reused Water</b>	
8	By 2030, supplement depleted groundwater with 0.7 BCM/y of treated wastewater for direct reuse for the priority areas of 144,000 feddans in the West Delta agriculture project	9
	<b>WW Reuse for New Cities Landscaping &amp; Neighboring Agriculture</b>	
9	By 2030, direct 0.25 BCM/y of treated wastewater generated from the New Administrative City to 5000 feddans of Landscaping within the City and about 30,000 feddans of neighboring agriculture areas.	9

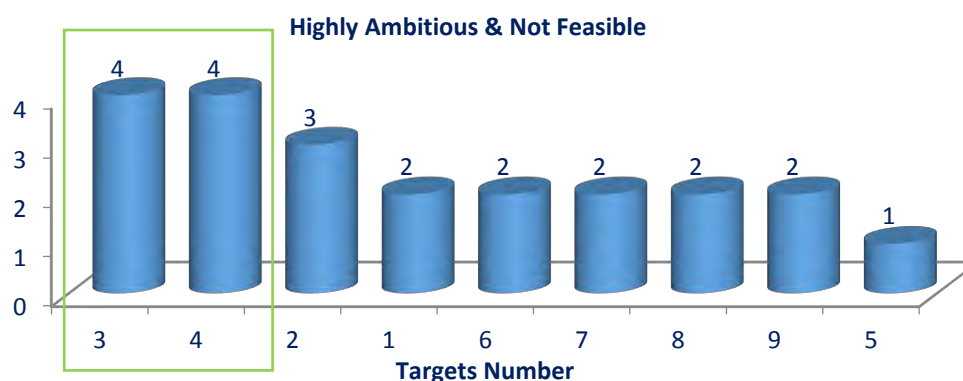
Rank	Target Number	Local Proposed 2030 Reuse Targets	Realistic & Feasible (Scores)
1	5	By 2030, swap 0.10 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 20,000 feddans of agriculture lands in El-Marashda, Qena within the 1.5 million feddans project	10
2	2	By 2030, treat and (indirectly/directly) reuse 0.365 BCM/y of mixed agriculture drainage and wastewater from Mahsama drain for 73,000 feddans of agriculture in North Sinai	9
3	6	By 2030, swap 0.060 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 12,000 feddans of agriculture lands in West Kom Ombo, Aswan within the 1.5 million feddans project	9
4	7	By 2030, swap 0.04 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 8,000 feddans of agriculture lands in El-Tor, South Sinai within the 1.5 million feddans project	9
5	8	By 2030, supplement depleted groundwater with 0.7 BCM/y of treated wastewater for direct reuse for the priority areas of 144,000 feddans in the West Delta agriculture project	9
6	9	By 2030, direct 0.25 BCM/y of treated wastewater generated from the New Administrative City to 5000 feddans of Landscaping within the City and about 30,000 feddans of neighboring agriculture areas.	9
7	1	By 2030, treat and (indirectly/directly) reuse 1.83 BCM/y of mixed agriculture drainage and wastewater from Bahr El Baqr drain for 365,000 feddans of agriculture in North Sinai	8
8	3	By 2030, swap 0.9 BCM/y of allocated nonrenewable groundwater with direct treated wastewater for 180,000 feddans of agriculture lands within the 1.5 million feddans project and save fresh groundwater for drinking purposes	8
9	4	By 2030, swap 0.7 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 140,000 feddans of agriculture lands in West Menya & West West Menya within the 1.5 million feddans project	8





	<b><u>Local Proposed 2030 Water Reuse Targets</u></b>	<b><u>Highly Ambitious &amp; Not Feasible</u></b>
	<b>Treatment and Reuse of Mixed Agriculture Drainage &amp; Wastewater</b>	<b>Scores</b>
1	By 2030, treat and (indirectly/directly) reuse 1.83 BCM/y of mixed agriculture drainage and wastewater from Bahr El Baqr drain for 365,000 feddans of agriculture in North Sinai	2
2	By 2030, treat and (indirectly/directly) reuse 0.365 BCM/y of mixed agriculture drainage and wastewater from Mahsama drain for 73,000 feddans of agriculture in North Sinai	3
	<b>Swap Non-Renewable Groundwater with Direct Treated Wastewater Reuse</b>	
3	By 2030, swap 0.9 BCM/y of allocated nonrenewable groundwater with direct treated wastewater for 180,000 feddans of agriculture lands within the 1.5 million feddans project and save fresh groundwater for drinking purposes	4
4	By 2030, swap 0.7 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 140,000 feddans of agriculture lands in West Menya & West West Menya within the 1.5 million feddans project	4
5	By 2030, swap 0.10 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 20,000 feddans of agriculture lands in El-Marashda, Qena within the 1.5 million feddans project	1
6	By 2030, swap 0.060 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 12,000 feddans of agriculture lands in West Kom Ombo, Aswan within the 1.5 million feddans project	2
7	By 2030, swap 0.04 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 8,000 feddans of agriculture lands in El-Tor, South Sinai within the 1.5 million feddans project	2
	<b>Supplement Depleted Groundwater with Treated Reused Water</b>	
8	By 2030, supplement depleted groundwater with 0.7 BCM/y of treated wastewater for direct reuse for the priority areas of 144,000 feddans in the West Delta agriculture project	2
	<b>WW Reuse for New Cities Landscaping &amp; Neighboring Agriculture</b>	
9	By 2030, direct 0.25 BCM/y of treated wastewater generated from the New Administrative City to 5000 feddans of Landscaping within the City and about 30,000 feddans of neighboring agriculture areas.	2

Rank	Target Number	Local Proposed 2030 Reuse Targets	Highly Ambitious & Not Feasible (Scores)
1	3	By 2030, swap 0.9 BCM/y of allocated nonrenewable groundwater with direct treated wastewater for 180,000 feddans of agriculture lands within the 1.5 million feddans project and save fresh groundwater for drinking purposes	4
2	4	By 2030, swap 0.7 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 140,000 feddans of agriculture lands in West Menya & West West Menya within the 1.5 million feddans project	4
3	2	By 2030, treat and (indirectly/directly) reuse 0.365 BCM/y of mixed agriculture drainage and wastewater from Mahsama drain for 73,000 feddans of agriculture in North Sinai	3
4	1	By 2030, treat and (indirectly/directly) reuse 1.83 BCM/y of mixed agriculture drainage and wastewater from Bahr El Baqr drain for 365,000 feddans of agriculture in North Sinai	2
5	6	By 2030, swap 0.060 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 12,000 feddans of agriculture lands in West Kom Ombo, Aswan within the 1.5 million feddans project	2
6	7	By 2030, swap 0.04 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 8,000 feddans of agriculture lands in El-Tor, South Sinai within the 1.5 million feddans project	2
7	8	By 2030, supplement depleted groundwater with 0.7 BCM/y of treated wastewater for direct reuse for the priority areas of 144,000 feddans in the West Delta agriculture project	2
8	9	By 2030, direct 0.25 BCM/y of treated wastewater generated from the New Administrative City to 5000 feddans of Landscaping within the City and about 30,000 feddans of neighboring agriculture areas.	2
9	5	By 2030, swap 0.10 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 20,000 feddans of agriculture lands in El-Marashda, Qena within the 1.5 million feddans project	1



	<b>Local Proposed 2030 Water Reuse Targets</b>	<b>Not Ambitious Enough</b>
	<b>Treatment and Reuse of Mixed Agriculture Drainage &amp; Wastewater</b>	<b>Scores</b>
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5	By 2030, swap 0.10 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 20,000 feddans of agriculture lands in El-Marashda, Qena within the 1.5 million feddans project	1
6	By 2030, swap 0.060 BCM/y of allocated nonrenewable fresh groundwater with direct treated wastewater for 12,000 feddans of agriculture lands in West Kom Ombo, Aswan within the 1.5 million feddans project	1
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	<b>WW Reuse for New Cities Landscaping &amp; Neighboring Agriculture</b>	
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