

MEWINA

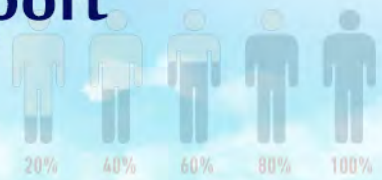
مشروع التقييم والمتابعة لقطاع المياه بدول شمال أفريقيا
Monitoring and Evaluation for Water In North Africa



African Water Facility
Facilité africaine de l'eau
Mobilising Resources for Water in Africa



N-AMCOW Region 2012 State of the Water Report



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Contents

1. Introduction	8
2. National, Continental, and Global Targets	10
2.1. Algeria	10
2.2. Egypt	11
2.3. Libya	23
2.4. Mauritania	24
2.5 Tunisia	25
2.6 Overall Assessment of Countries Performance towards achieving AMCOW Pan-African targets	27
2.7 Overall Assessment of Countries Performance towards achieving MDG targets	34
3. National SOW Indicators, Values, and Analysis	36
3.1. Water & Availability	36
I. Blue Water	36
II. Green Water	37
III. Non-Conventional Water	38
3.2. Water & Uses	49
3.3. Water & Land-Use Changes	55
3.4. Water & Services	58
3.5. Water & Energy	62
3.6. Water & Population	63
3.7. Water & Health	66
3.8. Water & Quality	67
3.9. Water & Ecosystems	70
3.10. Water & Climate	71
3.11. Water & Socio-Economics	73

3.12. Water & Finance	75
3.13. Water & Trade	77
3.14. Water & Governance	80
3.15. Water & International Relations	83
6. References	86
Annexes	87
Algeria AMCOW Pan African M&E Performance Sheet.....	87
Egypt AMCOW Pan African M&E Performance Sheet.....	100
Libya AMCOW Pan African M&E Performance Sheet	110
Mauritania AMCOW Pan African M&E Performance Sheet.....	124
Tunisia AMCOW Pan African M&E Performance Sheet	142

List of Tables

Table 1. NWRP Indicators and Targets	12
Table 2. MDG 7 Targets.....	22
Table 3. Tunisia’s Nationally set Water Sector Targets and Indicators.....	25
Table 4. Tunisia’s Water Sector’s targets with minor progress	26
Table 5. Tunisia’s progress with respect to Water MDGs	27
Table 6. Water & Availability Indicators Values	39
Table 7. Water & Uses Indicator Values	50
Table 8. “Water & Land Use Changes” Indicator values.....	55
Table 9. Water & Services Indicator Values	60
Table 10. “Water & Energy” Indicator values.....	62
Table 11. “Water & Population” indicator values	64
Table 12. “Water & Health” Indicator Values.....	66
Table 13. Water & Quality Indicator Values	68

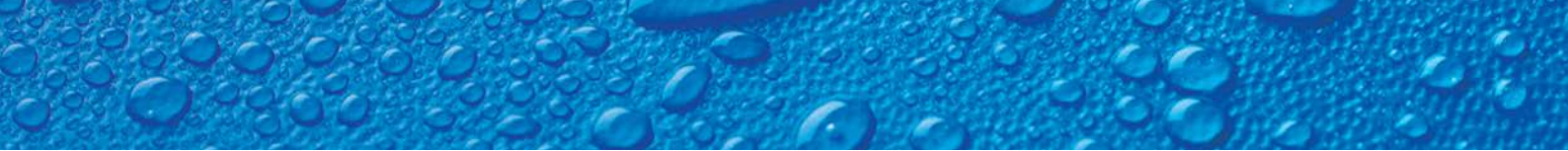


Table 14a. Water & Quality indicator values in Tunisia	69
Table 14b. “Water & Quality” Values for Egypt	69
Table 15. Water & Ecosystems Values.....	70
Table 16. “Water & Climate” Indicator Values	72
Table. 17. “Water & Socio-Economics” Indicator Values	74
Table 18. “Water & Finance” Indicator Values	76
Table 19. Virtual Water embedded in Agricultural Products	78
Table 20. Exported Agricultural Products in the N-AMCOW Region	78
Table 21. Imported Agricultural Products in the N-AMCOW Region	79
Table 22. “Water & Trade” Indicators.....	79
Table 23. “Water & Governance” Indicators Values.....	81
Table 24. “Water & International Relations” Indicators Values	84

List of Figures

Figure 1. MEWINA Countries Overall Performance in Pan-African Indicators	28
Figure 2a. MEWINA Countries Performance in Pan-African M&E Theme 1.....	28
Figure 2b. MEWINA Countries progress in the AMCOW Energy Target.....	29
Figure 2c. MEWINA Countries Agricultural Water Productivity	30
Figure 2d. MEWINA Countries Water Demand Satisfaction Index.....	30
Figure 3. MEWINA Countries Performance in Pan-African M&E Theme 2.....	31
Figure 4a. MEWINA Countries Performance in Pan-African M&E Theme 3for Water Supply	31
Figure 4b. MEWINA Countries Performance in Pan-African M&E Theme 3for Sanitation ..	32
Figure 5. MEWINA Countries Performance in Pan-African M&E Theme 4.....	32
Figure 6. MEWINA Countries Performance in Pan-African M&E Theme 5.....	33
Figure 7. MEWINA Countries Performance in Pan-African M&E Theme 6.....	33
Figure 8. MEWINA Countries Performance in Pan-African M&E Theme 7.....	34

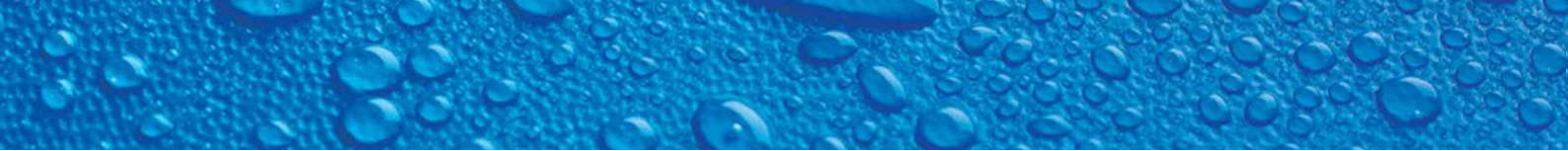


Figure 9. North Africa Water Supply Coverage in 2012 (JMP, 2014)	35
Figure 10. North Africa Sanitation Coverage in 2012 (JMP, 2014)	35
Figure 11a. Spatially Varied Precipitation Depth	40
Figure 11b. Precipitation Depth Distribution in the N-AMCOW Region.....	41
Figure 12. Annual Precipitation Volume	41
Figure 13. Total Internal Renewable Blue Water Resources	42
Figure 14. Total Renewable Blue Water Resources	42
Figure 15. Total Non-Renewable Water Resources in the N-AMCOW Region	43
Figure 16. Total Green Water Resources in the N-AMCOW Region.....	43
Figure 17. Blue and Green water Use for Green Cover in the N-AMCOW Region	44
Figure 18. Total Renewable Water Resources in the N-AMCOW Region.....	44
Figure 19. Produced and Treated Wastewater in the N-AMCOW Region	45
Figure 20. Produced Agricultural Drainage in the N-AMCOW Region.....	45
Figure 21. Produced Desalinated Water in the N-AMCOW Region	45
Figure 22. Green water Resources in the N-AMCOW Region	46
Figure 23. Renewable and Non-Renewable Water Resources in the N-AMCOW Region.....	46
Figure 24. Renewable Water Resources in the N-AMCOW Region	47
Figure 25. Conventional and Non-Conventional Water Resources in the MEWINA Countries	47
Figure 26. Total Non-Conventional Water Resources in the MEWINA Countries	48
Figure 27. Total Available Water Resources (TAWR).....	48
Figure 28. Water Withdrawals in MEWINA Countries	51
Figure 29a. Agricultural Water Use.....	51
Figure 29b. Rainfed ET in N-AMCOW Region.....	52
Figure 29c. Irrigated ET in N-AMCOW Region	53
Figure 29d. Barren Land ET in N-AMCOW Region.....	53
Figure 29e. Open Water Bodies ET in N-AMCOW Region	54
Figure 30. Blue and Green Water Use in Agriculture in the Whole N-AMCOW REGION....	54
Figure 31. Land Use in the N-AMCOW Region.....	56

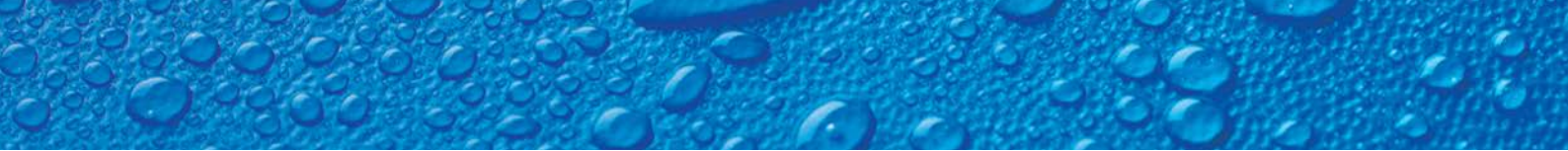


Figure 32. Overall Land Use in the Whole N-AMCOW Region	57
Figure 33a. Urban Encroachment in Nile Delta, Egypt	57
Figure 33b. Impact of Green cover Land Use change on Groundwater Recharge (mm/year) .	58
Figure 33c. Impact of Green cover Land Use change on Surface Water Runoff (mm/year . . .	58
Figure 34. Water Supply and Sanitation Coverage (JMP)	61
Figure 35. Water Supply and Sewage Network Lengths in the N-AMCOW Region	61
Figure 36. Hydropower Generation and Capacity in MEWINA Countries	62
Figure 37. Total Renewable Water Resources per Capita in the N-AMCOW Region	64
Figure 38. Total Renewable Water Resources per Capita in the N-AMCOW Region	65
Figure 39. Total Renewable Water Resources per Capita in the N-AMCOW Region	65
Figure 40. Total Green Water Consumption per Capita in the N-AMCOW Region.	65
Figure 41. Total Available Water Resources per Capita in the N-AMCOW Region	66
Figure 42. Diarrhea Prevalence children under 5 in the N-AMCOW Region.	67
Figure 43. Wetlands in the N-AMCOW Region	71
Figure 44a. Floods events from 1989-2011.	73
Figure 44b. Floods in Sinai, Egypt in 2010	73
Figure 45. Unusual Snow in Egypt	73
Figure 46. Water Productivity in Industry and Agriculture	75
Figure 47. Job per Agricultural drop in the N-AMCOW Region	75
Figure 48a. Total Investment in the Water Sector in MEWINA countries	77
Figure 48b. Percentage of National Budget Directed to Water & Sanitation Sector	77
Figure 49. Virtual Water Flows in the N-AMCOW Region	79
Figure 50. Overall Water Use Efficiency in the N-AMCOW Region.	83
Figure 51. Water Sustainability/ Depletion Index	83
Figure 52. Shared Water Dependency Ratio	84
Figure 53. Shared Water Agreements and Protocols	84

1. Introduction

Since the evolution of Integrated Water Resources Management (IWRM) as a globally renowned and accepted water management approach, proper assessment has emerged as its inseparable companion. Some would even argue that Assessment is part and parcel of IWRM.

One of the most important key aspects of IWRM is the fact that it was the first approach to recognize water resources as a cross cutting issue that relates not only to one sector, but to all sectors dealing with human development, accordingly, a proper water assessment should cover all areas of development where water is the most significant common factor. Hence, the term “State of the Water “ is of utmost relevance as it not only addresses the broad extent of water throughout all human development sectors, but it also caters to all public, planning, research, and decision making managerial needs.

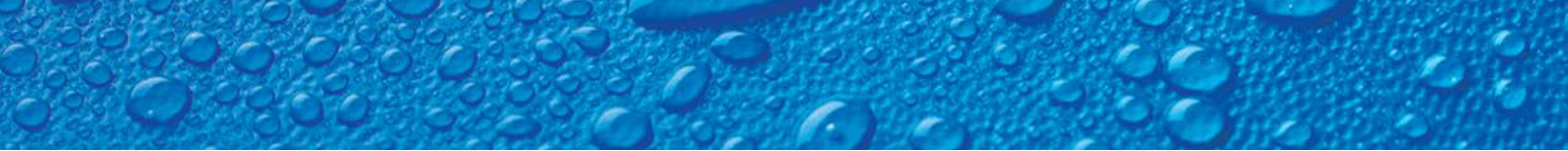
While many countries around the world adopted National Monitoring and Evaluation schemes that eventually lead to rigorous water resources assessments, regional and international organizations took the initiative of reporting on the status of water resources on regional and global levels. UN organizations recently joined their efforts in Global water reporting; under UN-Water to produce World Water Assessment Program (WWAP), the FAO WWDR which also makes use of the earlier AQUASTAT Report that offers easily accessible water related statistics for almost each and every country in the world. UN-Water WWDR used to be published every three years with a different theme adopted in each report. UN-Water has made it a habit of disseminating a new WWDR report during The World Water Forum which takes place every three years. However, a decision was made recently to issue the WWDR every year.

Aside from global water reporting efforts made by international organizations, water resources reporting focusing on one water body that is shared between different countries, is attracting attention. Recent examples include the State of the Nile Basin Report that was published by the Nile Basin Initiative in 2012, and the State of the Nubian Sandstone aquifer report that was published by CEDARE and UN-ESCWA in 2008. The latter is considered a breakthrough as such efforts were usually directed to transboundary surface water resources.

As for regional “State of the Water” reporting, CEDARE and the Arab Water Council (AWC) took that initiative for the Arab Region in 2004, when the first Arab State of the Water report was published. The report was innovative in many ways, it was the first regional water assessment report to consider “green water” which is a very important indicator, as will be shown throughout this report. Also, it was one of the first reports to use Geographical Information System (GIS) software to determine the accurate volume of precipitation produced in each assessed country.

Under the framework of the “Monitoring and Evaluation of the Water sector in North Africa “ (MEWINA) project, a rigorous assessment of water resources and all water related aspects for the five participating countries (Algeria, Egypt, Libya, Mauritania, and Tunisia) was required so that the project lives up to its name, and present a complete monitoring and evaluation effort.

The Regional “State of the Water” Reporting in the MEWINA Region was preceded by many important steps including the development of adequate indicators and harmonizing such indicators with nationally existing indicators in the MEWINA countries and also continental and globally acclaimed indicators. A comprehensive capacity building for State of the Water Reporting followed the harmonization process



where consensus was reached on the approaches and methodologies to assess, measure, and report on all indicators, which in turn lead to the development of the National State of the Water Reports. The Regional State of the Water Report presents a regional overview of the outputs of the whole State of the Water Reporting process.

2. National, Continental, and Global Targets

This chapter will focus on all nationally set water related targets in the country of interest, as well as continental and global targets that have been adopted.

2.1. Algeria

The Climate in different zones of Algeria ranges between arid and semi-arid is characterized by a high population growth rate, making it essential to increase agricultural productivity to ensure food security. Agricultural development is strongly influenced by irrigation. Agriculture has become highly strategic, because water resources are highly sensitive to climatic conditions, and the soil is often weakened by the aggressiveness of natural phenomena. The new water policy is based on the land use policy, which has set itself the objective of creating a dynamic rebalancing of the territory, including the Sustainable Development of Central Highlands and the South zone. Achieving this goal requires transferring large volumes of water, and to create unconventional resources, namely, desalination of sea water, reuse of treated wastewater, and implementation of a water conservation policy.

Based on the above, the National targets for mobilization and management of water resources were developed, and can be stated as follows:

- Ensure the sustainability of water resources
- Ensuring access to water for all citizens by mobilizing the maximum possible conventional and unconventional resources,
- Ensure access to sanitation for all
- Supporting food security strategy with the mobilization of new water resources for the expansion of irrigated areas
- Ensure regional equity in access to water, for the implementation of a program of major transfers (Sustainable Development of Highlands and Southern Regions)
- Improving the quality of public water services and sanitation through rehabilitation and modernization of the management of water supply and sanitation systems.
- Protect water ecosystems through the rehabilitation and extension of sewerage and wastewater treatment systems
- Protect the territory against the major risks

As for Continental targets, Algeria fully adopts the AMCOW targets. Details on the progress achieved in each target are shown in Annexes.

As for the International Targets and Objectives. Algeria adopts the 2015 Millennium goals for development, framed by the f the United Nations, especially on the issue of water.

Also, global targets for water are:

In terms of access to water and sanitation:

- Ensuring access to water for all and the Right to Water

- Improve access to integrated sanitation for all
- Improving hygiene and health through water and sanitation
- Prevent and respond to risks and water-related crises
- Contribute to cooperation and peace through water

In terms of economic development:

- Balancing the various uses of water through integrated management
- Contribute to food security by optimal use of water
- Harmonize water and energy
- Promoting green growth and value ecosystems

In terms of environmental protection:

- Improve the quality of water resources and ecosystems
- Adjust pressures and footprints of human activities on water
- Respond to climate and global changes in an urbanizing world

2.2. Egypt

In Egypt, the most comprehensive set of indicators for the water sector is the National Water Resources Plan (NWRP) targets. They cover the following key aspects (or pillars):

- Developing more water resources
- Making better use of existing resources of water
- Improving water quality management
- Enabling environment to enhance implementation of NWRP

Each aspect (or Pillars) includes a set of measures that are linked to indicators with their targets that have to be achieved by 2017. Table 1 shows those national indicators and targets. The data for each indicator is stored in an M&E system that was developed for the NWRP. This Data comes from various organizations as shown in Table 1 and stored with the developed NWRP M&E system. It then aggregated to the level of measures (NWRP, 2011). The NWRP M&E complies with several criteria, namely:

- Able to cater several partner agencies
- Able to receive data from different offices
- Physically stored in a safe place, but available through the internet
- Well maintainable, also after the NWRP-CP is completed, by MWRI staff
- Able to present information in clear formats

The National Water Resources plan has set indicators with target values to be reached by the year 2017. The indicators and Target values are shown in Table. 1

Table 1. NWRP Indicators and Targets

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
Add more conventional and non-conventional water resources to the country's water budget	Continue co-operation with Nile riparians	Ratification of the Legal and Institutional Framework	Milestones	100%	NA	MWRI	NWS
		Annual Volume of Nile Water Available to Egypt	MM ³ /YEAR	57500	NA	MWRI	NWS
	Develop groundwater in the Desert	# of operational wells	Number	2168	NA	MWRI	GWS
		Annual Volume of abstracted deep groundwater	MM ³ /YEAR	4985	NA	MWRI	GWS
	Stimulate rainfall and flash floods harvesting	# of retention dams	Number	72	NA	MWRI	GWS
		# of ground reservoirs	Number	72	NA	MWRI	GWS
		Capacity of the rainfall and flash floods harvesting storage reservoirs	MM ³ /YEAR	72	NA	MWRI	GWS
		Annual Volume of Water Harvested and utilized	MM ³ /YEAR	72	NA	MWRI	GWS
	Increase seawater desalination and brackish groundwater use (in the coastal areas)	Capacity of Desalination Plants in tourism areas	MM ³ /YEAR	96	NA	MoT	TDA
		# of desalination plants in all governorates	Number	53	NA	MHUUD	HCWW
		Capacity of Desalination Plants in all governorates	MM ³ /YEAR	97	NA	MHUUD	HCWW
		Annual Volume of Seawater desalinated	MM ³ /YEAR	87	NA	MHUUD	HCWW
	Improve management and increase pumping of shallow groundwater	Total number of wells	Number	50000	NA	MWRI	GWS

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
		Total number of wells registered	Number	50000	NA	MWRI	GWS
		Total number of wells licensed	Number	25000	NA	MWRI	GWS
		# of observation wells in Nile Valley and Delta	Number	Undefined	NA	MWRI	GWS
		Annual Volume of shallow groundwater abstracted	MM ³ /YEAR	8390	NA	MWRI	GWS
Raise water use efficiency	Continue irrigation improvement programs (IIP/ IIIMP)	Total areas with improved irrigation handed over to WUAs	1000 Feddans	1428	NA	MWRI	IIS
	Expand on-farm improved water management	Area of agricultural lands with laser land leveling applied	1000 Feddans	1300	NA	MALR	EALIP
		Area of agricultural lands with improved marwas	1000 Feddans	1300	NA	MALR	EALIP
		Total area where on-farm improvement completed	1000 Feddans	1300	NA	MALR	EALIP
	Apply modern irrigation techniques in new lands and oases	Total area of violations against application of modern irrigation techniques in new lands and oases	1000 Feddans	0	NA	MWRI	ID
		Area of violations corrected	1000 Feddans	500	NA	MWRI	ID
		Area of new lands applying modern irrigation	1000 Feddans	3000	NA	MWRI	ID
		Total irrigated lands in oases	1000 Feddans	500	NA	MWRI	GWS
		Area of oasis lands applying modern irrigation	1000 Feddans	500	NA	MWRI	GWS
	Promote drainage water reuse in selected areas and expand intermediate drainage reuse	Volume of Reused Drainage Water in Main System	MM ³ /YEAR	8000	NA	MWRI	IS

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
	Promote growing salt-tolerant and short duration crops	Number of salt tolerant crops developed and cultivated	Number	Undefined	NA	MALR	ARC
		Number of short duration crops developed and cultivated	Number		NA	MALR	ARC
		Area of agriculture land using salt tolerant crops	1000 Feddans		NA	MALR	ASS
		Area of salt affected soil	1000 Feddans		NA	MALR	ARC
		Area of agriculture land using short duration crops	1000 Feddans		NA	MALR	ASS
	Improve drinking water availability and reduce losses	# of installed functional water meters	Number	13800000	NA	MHUUD	HCWW
		% of unaccounted for water = [1-(Ratio of quantity of drinking water billed / quantity of drinking water produced)] * 100%	PERCENT	25	NA	MHUUD	HCWW
		Total installed capacity of drinking water treatment plants	MM ³ / DAY	44	NA	MHUUD	HCWW
		Actual annual volume of drinking water produced	MM ³ / Day	36	NA	MHUUD	HCWW
		% of safe drinking water coverage in rural areas	PERCENT	100	MDG Target 10 Halve, by 2015, the proportion of people without sustainable access to safe drinking water	MHUUD	HCWW
% of safe drinking water coverage in urban areas		PERCENT	100	MHUUD		HCWW	
Promote water saving technologies and practices in industry	New norms of standard water consumption for various industries issued	Milestones	100%	NA	MoIFT	IDA	

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
		Total number of industrial units	Number	38000	NA	MoIFT	IDA
		# of industrial units applying water saving techniques	Number	24700	NA	MoIFT	EFI
	Expand the reuse of treated municipal wastewater	Area of land cultivated using treated wastewater	1000 Feddans	Undefined	NA	MALR	SWERI
		Total volume of treated domestic wastewater utilized	MM ³ / Year	741	NA	MHUUD	HCWW
	Study alternative operations of High Aswan Dam	Alternative operating rules Study is completed and discussed	Milestones	100	NA	MWRI	NWRC
Protect agricultural lands, improve soil fertility and productivity	Improve agricultural drainage	Area served with functional open drains	1000 Feddans	8291	NA	MWRI	EPADP
		Area of agricultural land provided with functional tile (subsurface) drainage	1000 Feddans	6400	NA	MWRI	EPADP
		Number of complaints related to drainage	Number	Undefined	NA	MWRI	EPADP
	Integrated Management of Coastal Zones	Total length of endangered shoreline	KMs	155	NA	MWRI	ESPA
		Length of coastline protected	KMs	15	NA	MWRI	ESPA
		Length of coastline maintained	KMs	250	NA	MWRI	ESPA
Improve water distribution system to enhance water delivery	Control well discharges in desert areas	Inspection and Monitoring System is Established and Running	Milestones	100	NA	MWRI	GWS
	Strengthen Participatory Irrigation Management	# of BCWUAs established	Number	4000	NA	MWRI	IAS
		# of WUAs established	Number	24000	NA	MWRI	IIS

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
		# of Branch canals where IAS is providing advice	1000 Feddans	4000	NA	MWRI	ID
		# of WUOs supported by IAS	Number	4000	NA	MWRI	IAS
	Continue canals and drains maintenance and extend aquatic weed biological control	Length of canals network maintained annually	KMs	25000	NA	MWRI	ID
		Length of drains network maintained annually	KMs	18000	NA	MWRI	EPADP
		Length of canal networks where biological or manual weed control is applied	KMs	11000	NA	MWRI	ID
	Improve water distribution and control infrastructure	# of Control Structures improved for efficient water distribution	Number	206	NA	MWRI	IS
		# of grand barrages replaced or rehabilitated	Number	13	NA	MWRI	RGBS
	Rehabilitate and replace pumping stations	# of pumping stations rehabilitated	Number	200	NA	MWRI	MED
		# of well pumps rehabilitated	Number	570	NA	MWRI	MED
		# of floating pumps rehabilitated	Number	45	NA	MWRI	MED
		Pumping Performance Efficiency achieved (%)	PERCENT	70	NA	MWRI	MED
	Improve High Aswan Dam and Lake Nasser	% of maintenance and rehabilitation works completed for the dam complex vs. needs	PERCENT	100	NA	MWRI	HADA
	Protect and develop River Nile and its banks	Length of River Nile developed (maintained / protected)	KMs	235	NA	MWRI	NPS
	Provide rural solid waste management systems	# of villages equipped with solid waste collection facilities	Number	100	NA	MoLD	LOCAL ADMIN UNITS

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
	Maintain navigational channels in the Nile	Length of the navigational channel improved	KMs	400	NA	MoTR	RTA
	Restrict public water supply sources to Main Canals	Updated standards and criteria for drinking water treatment plants intakes are agreed upon and applied	Milestones	100	NA	MWRI	ID
	Coordinate irrigation supply and demand	Area of agricultural land covered by the Matching Irrigation Supply and Demand (MISD) program	1000 Feddans	6600	NA	MWRI	IS
		MWRI, MALR, and MoIFT agree on strategic cropping pattern	Milestones	100%	NA	MWRI	ID
	Continue planned horizontal expansion based on available water	Total area of agricultural lands (GIS Satellite Images)	1000 Feddans	10000	NA	MWRI	ID
		Area of land reclaimed (equipped with primary infrastructure)	1000 Feddans	2300	NA	MWRI	HES
		Area of land reclaimed that is actually cultivated	1000 Feddans	2400	NA	MWRI	HES
Prevent / Minimize pollution of water resources	Minimize pollution of water courses from industries	# of customs exemptions issued by the MoF for cleaner production machinery and equipments; at the request of the MoEA	Number	Undefined	NA	MoEA	EEAA
		Total value of soft loans and TA provided for Industries to achieve environmental compliance using revolving funds mechanisms	Million Egyptian Pounds (LE)	Undefined	NA	MoEA	EEAA
		# of grants and soft loans offered to support industrial self-compliance	Number	Undefined	NA	MoEA	EEAA

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
		# of industries received Technical assistance to achieve environmental self-compliance	Number	Undefined	NA	MoEA	EEAA
		Area of new industrial zones (parks) established to accommodate polluting industries	Million M ²	Undefined	NA	MoIFT	IDA
		# of factories and industrial facilities that were relocated	Number	Undefined	NA	MoIFT	IDA
	Introduce load based discharge levies	Amend and apply Law (48/1982)	Milestones	100%	NA	MWRI	WQU
		Amend and apply the executive regulations of Law (48/1982)	Milestones	100 %	NA	MWRI	WQU
	Enhance industrial effluent monitoring and control	# of industrial units	Number	Undefined			
		# of factories inspected for industrial effluents (statistically selected samples)	Number	Undefined	NA	MoEA	EEAA
		# of sanctions enforced (cases filed and reported) due to non-compliance of industries	Number	Undefined	NA	MoEA	EEAA
		Establishment of the Supreme Council for Nile Protection	Milestones	100 %	NA	MWRI	WQU
	Promote environmentally friendly and organic agriculture practices	Provide Guidelines, rules and regulations on organic agriculture practices issued	Milestones	100 %	NA	MALR	CASWE
		Area of agriculture land using environmentally friendly (organic) practices	1000 Feddans	Undefined	NA	MALR	CASWE
		Quantity of imported agro-chemical pesticides	(Tons of effective material)	Undefined	NA	MALR	ASS

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
		Volume of exports of organic agriculture products to the European markets	metric tons	Undefined	NA	MALR	CASWE
	Review cage culture on Nile and all waterways	Remove illegal cage cultures in fresh water courses (Nile, Branches, Canals, ...)	Milestones	100 %	NA	MWRI	NPS
Treat polluted water resources	Expand wastewater treatment and sanitation services	Total capacity of municipal wastewater treatment plants	MM ³ / YEAR	7527	NA	MHUUD	HCWW
		Total volume of domestic wastewater treated	MM ³ / day	6804	NA	MHUUD	HCWW
		% of coverage of municipal wastewater connection in urban areas	Percent	100 %	MDG Target 10 Halve, by 2015, the proportion of people without sustainable access to safe drinking water and sanitation	MHUUD	HCWW
		% of coverage municipal wastewater connection in rural areas	Percent	50 %		MHUUD	HCWW
		# of the rural communities equipped with domestic local sanitation services	Number	Undefined	NA	MHUUD	HCWW
	Initiate cost recovery for drinking water and sanitary services	tariffs policy reviewed	Milestones	100 %	NA	MHUUD	HCWW
		Ratio of cost recovery achieved (revenues / operational costs) for drinking water and sanitary services	Ratio	1	NA	MHUUD	HCWW
	Promote treatment of industrial effluents	Standard specifications for discharged industrial wastewater issued	Milestones	100 %	NA	MoEA	EEAA

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
		# of industrial units operating wastewater treatment facilities	Number	Undefined	NA	MoEA	EEAA
		# of new industrial zones established with waste water pre-treatment plants (Separate Wastewater Collection Network and Treatment Facilities)	Number	Undefined	NA	MoEA	IDA
		# of industries discharging untreated industrial wastewater into waterways	Number	Undefined	NA	MoEA	EEAA
Control / match water uses with quality of water resources	Define functions of waterways	Definition of functions of waterways agreed	Milestones	100%	NA	MWRI	IS
	Reduce pollution to open waterways passing through residential areas	Length of waterways covered to minimize human contact with polluted water	KMs	350	NA	MoLD	LOCAL ADMIN UNITS
	Protect wells from pollution	Revised regulations and norms for groundwater protection	Milestones	100 %	NA	MWRI	GWS
Improve planning capacity, financing and cooperation within the water sector	Capacity building	# of training events	Number	Undefined	NA	MWRI	RCTWS
		# of participants	Number	Undefined	NA	MWRI	ID
		# of topics	Number	Undefined	NA	MWRI	WCD
	Intensify awareness campaigns and activities	# of awareness campaigns at local or national levels (TV broadcasts and bulletins), narrative of audience and topics covered	Number	Undefined	NA	MWRI	WCD
		% reduction of pollution	Percentages	Undefined	NA	MoEA	EEAA

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
		% improved WQ parameters	Percentages	Undefined	NA	MWRI	WQU
		# of reported violations	Number	Undefined	NA	MHUUUD	HCWW
		# of WQ essays and campaigns in newspapers and TV programmes	Number	Undefined	NA	MWRI	WCD
	Continue National Water Research Centre studies	# of studies undertaken by NWRC related to enhancement of water management in Egypt in addition to contribution to resolve practical issues	Number	Undefined	NA	MWRI	NWRC
	Support survey and mapping within MWRI	Area covered by analog maps in each series scale; Area covered by GIS maps in each series scale	KM ²	Undefined	NA	MWRI	ESA
	promote decentralized restructuring of MWRI for future roles	# of IWRM Districts and Directorates established	Number	250	NA	MWRI	IRU
	Promote Private Sector participation in financing water infrastructure projects, operation and maintenance	Investments by private sector in water projects	Billion LE/ year	Undefined	NA	MWRI	Planning Sector
	Promote national investment in the water sector	Total funds that are made available for the water sector in the state budget	Billion LE/ year	Undefined	NA	MWRI	Planning Sector
	Enhance Planning Processes	# of NGOs and CDAs involved in GWRP	Number	Undefined	NA	MWRI	NWRU
	Establish permanent National Water Council	National Water Council mandate and membership agreed	Milestones	Undefined	NA	MWRI	NWRU
Reduce rate of population growth	Expand family planning activities	Value of Total Fertility Rate within Egyptian women in fertile age (child / woman)	Number	Undefined	NA	MOHP	Population Sector

Intervention	Measures	Indicator	Units	National Target	Other Regional/ Global targets	Responsible/ Partner Agency	Department/ Sector
		% of prevalence of contraceptives use between Egyptian women in fertile age	PERCENT	Undefined	NA	MOHP	Population Sector

As for Continental targets, Egypt fully adopts the AMCOW targets. Details on the progress achieved in each target are shown in Annexes.

As for Global Targets, the water sector in Egypt adopts the United Nations MDG Goal 7, targets 9, 10, and 11 as shown in table. 2.

Table 2. MDG 7 Targets

MDG Target	Indicators
Target 10	Proportion of population with sustainable access to an improved water source, urban and rural
Halve, by 2015, the proportion of people without sustainable access to safe drinking water and sanitation	Proportion of population with access to improved sanitation, urban and rural

Moreover, the Water Sector in Egypt also adopts the Sustainable Development Goals which will build upon the Millennium Development Goals. It was decided establish an «inclusive and transparent intergovernmental process open to all stakeholders, with a view to developing global sustainable development goals to be agreed by the General Assembly». The SDGs are currently being developed, and it is anticipated that they will be:

- Action-oriented
- Concise
- Easy to communicate
- Limited in number
- Aspirational
- Global in nature
- Universally applicable to all countries while taking into account different national realities, capacities and levels of development and respecting national policies and priorities.

In particular, the SDGs should:

- Be useful for pursuing focused and coherent action on sustainable development
- Contribute to the achievement of sustainable development
- Serve as a driver for implementation and mainstreaming of sustainable development in the UN system as a whole
- Address and be focused on priority areas for the achievement of sustainable development

2.3. Libya

The National Strategy for Integrated Water Resources Management (NSIWRM) adapted by Libya for the period 2000 - 2025 has two major goals, namely, reversing the on-going: 1) deficits due to excessive water withdrawals and 2) water quality deteriorations. It proposed a general action plan which did not specify target indicators.

An extensive review of national water strategies, SOW reports, water monitoring and evaluation reports and other water related reports revealed that there are no officially declared national water-related target indicators in the forms adapted by regional, continental, or international organizations. However, such target indicators can be deduced from the different monitoring and SOW reports published by the institution charged with water resources management nationally, the GWA.

The national indicators are simply those indicators monitored presently by the different water related institutions. They are listed in Appendix I along with their methods of measurement / calculation.

As for Continental targets, Libya fully adopts the AMCOW targets. Details on the progress achieved in each target are shown in Annexes.

As for Global Targets, Libya has exceeded the targets set by the UN developed Water MDGs. The level of WSS services in Libya is among Africa's and the Arab states' highest thanks to the country's commitment to continuous upgrading of the WSS sector. According to the Arab Water Council/CEDARE report on Water Supply and Sanitation Coverage in the Arab States (2008), the fraction of Libya's population having access to improved water rose from 45 % in 1990 to 84 % in 2005. The WHO/UNICEF Joint Program for WSS (2008), reported fractions of 54.2, 54.9, and 54.4 % urban, rural, of the total population connected to public networks with those supplied from private wells accounting for 35.8, 26.9, and 33.5 %, respectively. Assuming that well water is protected and, hence, safe to drink, the total coverage for urban, rural and total population is 90, 81.8, and 87.9 %, respectively.

National census (2006) and Ministry of Health data (2010) indicate that 89 % of Libya's population is urban. Over 82 % of the total population obtains water from public or private water sources. The rest are supplied by other means (rainwater, transported water, etc.). They report an access to safe drinking water of over 97 %. According to these two sources and to data reported to MEWNA – Libya Project (2013) by the GCWW, about 65 % of the potable water is supplied by public networks, 17 % by private sources, 16 % is harvested rainwater, and 2 % is supplied transported by vehicles.

Access to sanitation is estimated by the same sources cited above at 99 % with 45 % served by centralized public networks and 54 % served by on-site sanitation systems. According to the UNDP Arab Human Development Report (2009), access to safe sanitation rose from 97 % in 1990 to 98 % in 2004. The AWC/CEDARE report (2009) gave fractions of 85 % and 97 % in 1990 and 2005, respectively.

Based on the national and international data reported above, it can be concluded that Libya has exceeded the MDGs. It is worth stressing that the present fraction with access to safe water supply and sanitation will increase as Libya completes implementation of its ongoing comprehensive National Program for Water Supply and Sanitation extending coverage to newly urbanized «smaller» communities and settlements.

2.4. Mauritania

To address the water availability problems, the Government set out a headline to improve access to safe water and sanitation in quantity, quality and aim at affordable price all sustainably.

As for Continental targets, Mauritania fully adopts the AMCOW targets. Details on the progress achieved in each target are shown in Annexes.

Moreover, Mauritania adhering to the MDGs, has set 2015 the following overall objectives:

Achieving the overall goal will be pursued through the following specific objectives: (i) improving access to safe water; (ii) identify water resources; (iii) develop surface water; (iv) improving sanitation conditions; (v) promote public - private partnership in the field of water; and (vi) capacity building of various stakeholders in the sector.

In terms of access to water, efforts will focus on: (i) improving the security of production and distribution; (ii) enhancing the quality and level of service in outlying areas and poor neighborhoods by promoting direct access to public drinking water (private connections); (iii) promotion of local manufacturing of pipes for drinking water and sanitation; (iv) improving the absorptive capacity of the sector by controlling drilling techniques and the acquisition of capital equipment; (v) the acquisition of the mine drainage solar equipment replacement equipment not adapted to the environment and whose operating costs are high; and (vi) the development and acceleration of the water supply in semi urban and rural.

To increase the level of knowledge of water resources, the proposed activities will include: (i) the promotion of integrated resource management (IWRM); (ii) encouraging the transfer of water from surplus areas to deficit areas through supply systems; (iii) the implementation of new general hydrogeological studies in different areas of the country, (iv) the completion of the mapping of water resources in each wilaya at appropriate scales; and (v) the delineation of protection areas and perimeters of Strategic Protection of catchment areas of major cities and secondary cities.

Regarding the recovery of surface waters, the focus will be on: (i) completion of structural works to mobilize surface water (dams, retention ponds ...) (ii) intensification of investment in the field of mobilization of surface water to meet the demand of different water users; (iii) training of human resources in the control and treatment of surface water; and (iv) design of a database and GIS on water surface.

On the Rural and semi-urban level, the creation of the National Office of Water Services in Rural Areas (ONSER) will ensure better water supply and optimize resources and to end the multiplicity of actors while ensuring greater involvement of people around the management committees of the water.

For improving sanitation conditions, the creation of the National Office of Sanitation (ONAS) will: (i) Enhance completion of a major reorganization of the city of Nouakchott project; and (ii) Construction of sanitation networks for the cities of Nouadhibou and Rosso.

In promoting public-private partnership, the main actions are: (i) sustainability of investments; and (ii) the optimal management of water infrastructure.

2.5 Tunisia

Tunisia has a well-developed Basic Monitoring and Evaluation system with clearly set indicators and targets. Well progressed targets and their indicators are shown in table 3. Table 4 shows targets that are not significantly progressing and their indicators along with the reasons behind the slow progress.

Table 3. Tunisia's Nationally set Water Sector Targets and Indicators

Objective	Indicator	Target	Definition	Methodology of Calculation
Mobilization of water resources	1-Storage capacity of large dams	1-Achieve a capacity of 2438 Mm ³ /year in 2016	Total storage volume of fresh water natural lakes and reservoirs created by large dams	Technical design data drawings for manmade reservoirs; hydrographic surveys and bathymetric maps in case of natural lakes
	2-Capacity North Water Transfer	2- Achieve transferred volumes of 800 Mm ³ /year in 2016	Total transfer capacity of North water network	Technical design data drawings for pumping stations, manmade reservoirs; hydrographic surveys and networks.
	3- Mobilization of Surface Water	3- Achieve mobilized volumes of 2355 Mm ³ /year in 2016	Total annual volumes mobilized by all dams relative to the potential of surface water that can be technically mobilized	Total annual volumes mobilized by all dams / Potential of surface water that can be technically mobilized that is 2,5 billions m ³ / year
	4- Exploitation of groundwater	4- Achieve exploited volumes of 2262 Mm ³ /year in 2016	Total annual volumes abstracted from groundwater sources and wells including non renewable resources per year	Total annual volumes abstracted from groundwater sources and wells including non renewable resources per year. Field surveys or estimation using well licenses and irrigation permissions.
Saving water and reducing losses	5-Equipment of irrigable areas by water saving equipment	5- Achieve an equipment rate of 93 % in 2016	Total area equipped with sprinklers, drip irrigation, localized irrigation concreted seguias/ Total irrigable area.	Total area equipped with sprinklers, drip irrigation, localized irrigation concreted seguias (ha)/ Total irrigable area (ha).
	6- Coverage of operating and maintenance costs of irrigation systems and rural drinking water supply	6- Achieve a coverage rate of 90 % for drinking water supply and 83% for irrigation systems in 2016	Operating and maintenance costs paid by users/Actual operating and maintenance costs	Operating and maintenance costs paid by users/Actual operating and maintenance costs for rural drinking water supply (TDN) Operating and maintenance costs paid by users/Actual operating and maintenance costs for irrigation systems (TDN)
	7- Renovation of networks, rehabilitation and development of irrigation	7- Development and operation input of 11 000 ha obsolete irrigated area in 2016	Modernization of irrigation networks, and rehabilitation & development of irrigated land	Surface of obsolete irrigated area, modernized, rehabilitated and back in operation (ha)

	8- Improving the efficiency of irrigation systems on farms	8- Achieve efficiency rate of 78% in 2016	Amounts of water distributed in head parcel of the farm, less losses in the farm network in comparison to total amounts of water distributed in head parcel.	(Amounts of water distributed in head parcel - losses in the farm network)/ Total amounts of water distributed in head parcel of the farm.
Rural water supply	9- Drinking water supply in rural areas	9- Achieve coverage rate of 98% in 2016	Percentage of population provided with piped or improved drinking- water source in rural areas	Population provided with piped or improved drinking- water source in rural areas / Total population in rural areas.
Preservation and sustainable water resources management	10- Annual rate of aquifers artificial recharge	10- Achieve an injection volume of 27,2 Mm ³ per year in 2016	Volume of injected water actually reaching the saturated zone/Total volume of water from different sources, injected into overexploited aquifers, causing a piezometric decline.	Volume of injected water actually reaching the saturated zone/Total volume of water injected into overexploited aquifers.
	11- Quantities of treated wastewater reused in agricultural irrigation	11- Achieve a volume of 22 Mm ³ / year 2016	Quantity of treated wastewater from WWTP that is reused in a given year in agricultural irrigation	Quantity of treated wastewater from WWTP that is reused in a given year in agricultural irrigation

Table 4. Tunisia's Water Sector's targets with minor progress

Indicator Category	Indicator	Target	Value for target indicator			State of the indicator	Possible reasons for deterioration or improvement
			2010	2011	2012		
Water & Availability (Blue Water)	Mobilization of Surface Water	Achieve mobilized volumes of 2355 Mm ³ /year in 2016	2144	2144	2188	Improvement	Achievement of new dams
Water & Availability (Non Conventional Water)	Treated wastewater reused in agricultural irrigation	Achieve a volume of 22 Mm ³ /year 2016	16	17	17	Stable	Farmers unwillingness
Water & Consumption	Withdrawals from Blue Groundwater	Achieve exploited volumes of 2262 Mm ³ /year in 2016	2121	2147	2172	Slight improvement	-New permits -New shallow and deep wells
	Improving the efficiency of irrigation systems on farms	Achieve efficiency rate of 78% in 2016	76	76	77	Slight improvement	
Water & services (Water Coverage and Accessibility)	Rural Water Supply Coverage	Achieve coverage rate of 98% in 2016	93,5	95,4	96,2	Improvement	Achievement of new rural drinking water supply systems (RDWSS)
Water & services (Water Infrastructure)	Dams capacity	Achieve a capacity of 2438 Mm ³ /year in 2016	2077	2077	2152	Improvement	Achievement of new dams
	Transfer Capacity of Water resources (Northern waters)	Achieve transferred volumes of 800 Mm ³ / year in 2016	700	700	700	Stable	

As for Continental targets, Tunisia fully adopts the AMCOW targets. Details on the progress achieved in

each target are shown in Annexes.

As for Global Targets, table 5 shows where the Tunisian Water Sector stands concerning the Millennium Development Goals and possible reasons for deterioration or improvement.

Table 5. Tunisia's progress with respect to Water MDGs

ThemeS	Performance category	Indicator	Performance Target	Value for target indicator	State of the indicator	Possible reasons for deterioration or improvement
Achieving the Water and Sanitation MDGs	8. Urban Water Supply	% of people without access	Reduce by 50% from 1990 to 2015	Reduce by 91,5% in 2011 (Urban + Rural)	Improvement	-
	9. Urban Sanitation	% of people without access	Reduce by 50% from 1990 to 2015	Reduce by 66,6% in 2011	Improvement	-
	10. Rural Water Supply	% of people without access	Reduce by 50% from 1990 to 2015	Reduce by 89,88% in 2011	Improvement	-
	11. Rural Sanitation and Hygiene	% of people without access	Reduce by 50% from 1990 to 2015	Reduce by 71,9% in 2011	Improvement	Institutional gap

2.6 Overall Assessment of Countries Performance towards achieving AMCOW Pan-African targets

While some MEWINA countries had specific years for achieving their National targets, it appears that a rigorous process for assessing the progress achieved towards the achievement of targets is either absent or not well elaborated. On the other hand, the continental targets that were set by AMCOW are well monitored by the AMCOW itself through the annual countries report presented to the African Union. Also, the Global targets which are common between all MEWINA Countries are bi-annually reported by the Joint Monitoring Programme (JMP) that is comprised of UNICEF and WHO. It is also anticipated that the forthcoming SDGs will be monitored in a similar manner. It is of utmost importance here to highlight the progress achieved by the MEWINA countries towards achieving the Pan-African Water and Sanitation Targets in 2013. All MEWINA countries were represented in the 2013 African Report and the 2014 African Report that is currently in progress has the updated data for the year 2013 for Algeria, Libya, Mauritania, and Tunisia. The complete data sheets are shown in Annexes.

Figure (1) shows the average Overall performance of the MEWINA countries in the seven AMCOW themes.



Figure 1. MEWINA Countries Overall Performance in Pan-African Indicators

It is shown in Figure (1) that Algeria is ranked first with respect to overall performance, followed by Tunisia, Egypt, Mauritania, and Libya. Figures (2) through (8) will show the performance of each MEWINA Country in each Pan-African Monitoring and Evaluation theme.

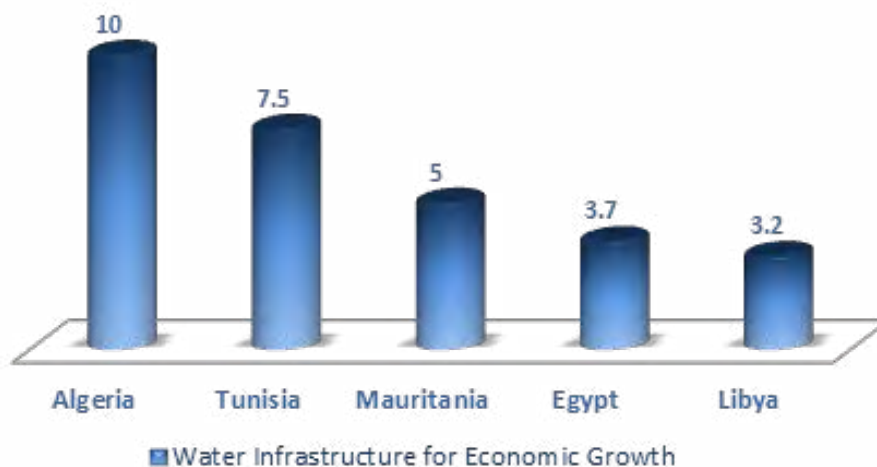


Figure 2a. MEWINA Countries Performance in Pan-African M&E Theme 1

Figure (2a) shows the overall performance in theme 1 titled “Water Infrastructure for Economic Growth” and has the following sub themes:

- Water and Energy
- Water and Agriculture

- Water & Multiple Uses

It appears from Figure (2a) that Egypt, Libya, and Mauritania are not on the right track for achieving the targets related to theme 1. While it is clear from the complete performance list annexed at the end of this report that the main reason for Mauritania's low score is the agricultural Water Productivity Indicator, performance values for this theme for Libya may be misleading as it is affected by the hydropower component that does not apply to the Non-Riverine Country. Moreover, one of the main concerns about the hydropower category of this theme is the fact that the target was set without considering that hydropower utilization in an upstream country could possibly jeopardize utilization in a neighbor riparian country. In the case of Egypt, the value could be misleading (Figure (2b)) as the country may not have the potential for increasing Hydropower utilization and Irrigated areas due to limited water resources.

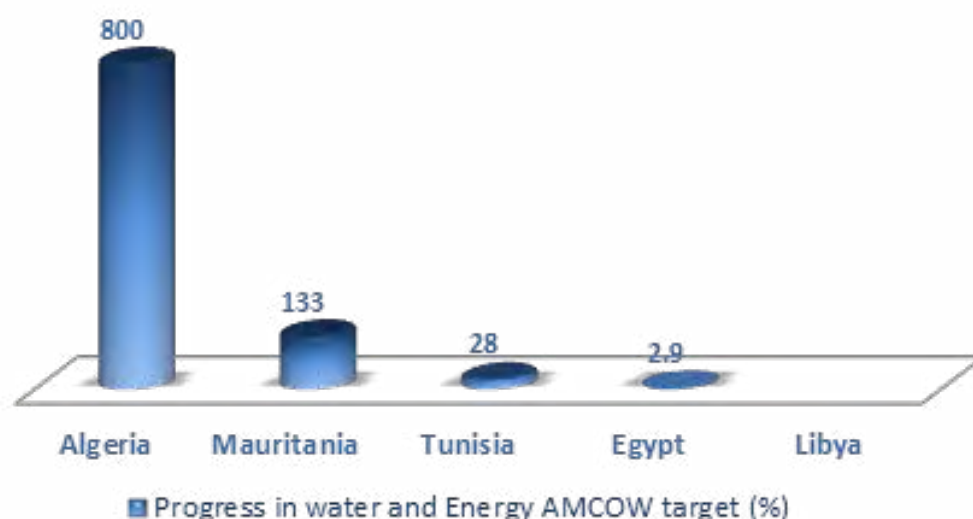


Figure 2b. MEWINA Countries progress in the AMCOW Energy Target

Figure (2c) shows the performance of MEWINA countries in one of the sub-themes under theme 1 titled “Agricultural Water Productivity”, it shows a great progress made by Algeria compared to other MEWINA countries, while Figure (2d) shows the countries performance under the “Water demand satisfaction Index” sub-theme, where it is clear that Tunisia has achieved the highest rate of increase in Water Demand Management satisfaction.

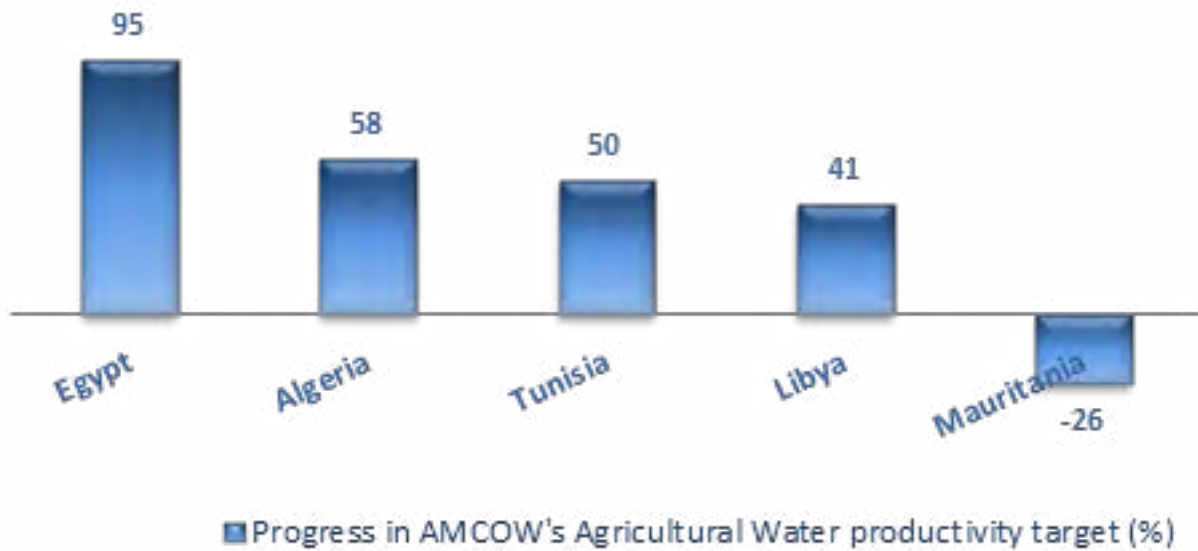


Figure 2c. MEWINA Countries Agricultural Water Productivity

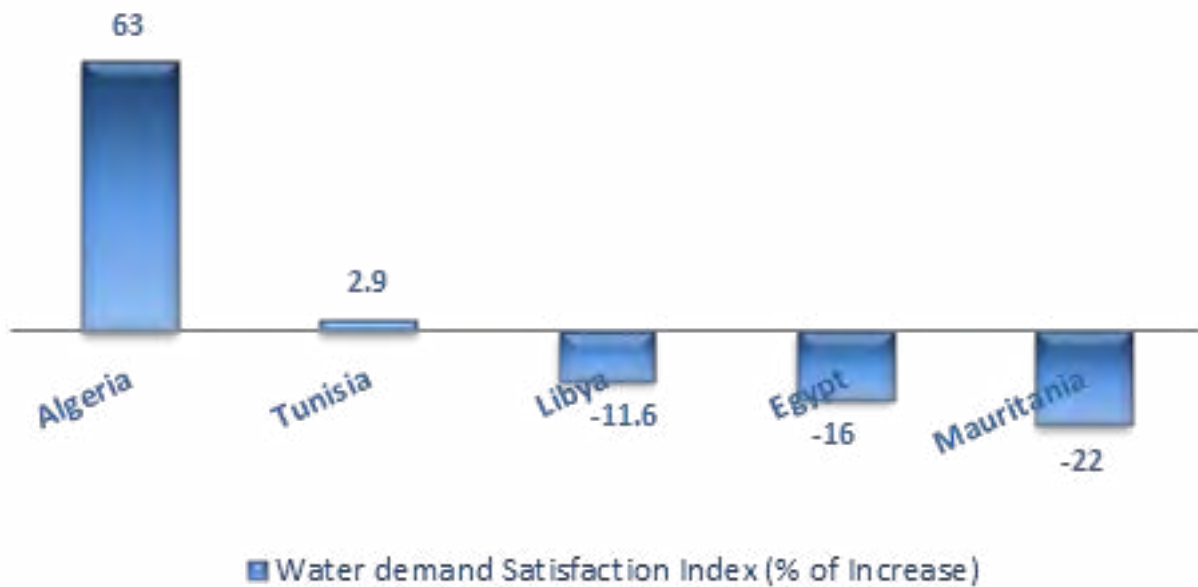


Figure 2d. MEWINA Countries Water Demand Satisfaction Index

Figure (3) shows the overall performance in theme 2 titled “Managing and Protecting Water Resources” and has the following sub themes:

- o Basin and Transboundary Water Resources Management
- o Rain Water

It is clear that the lack of rainwater use in the municipal sector is hindering the overall progress in the whole theme.

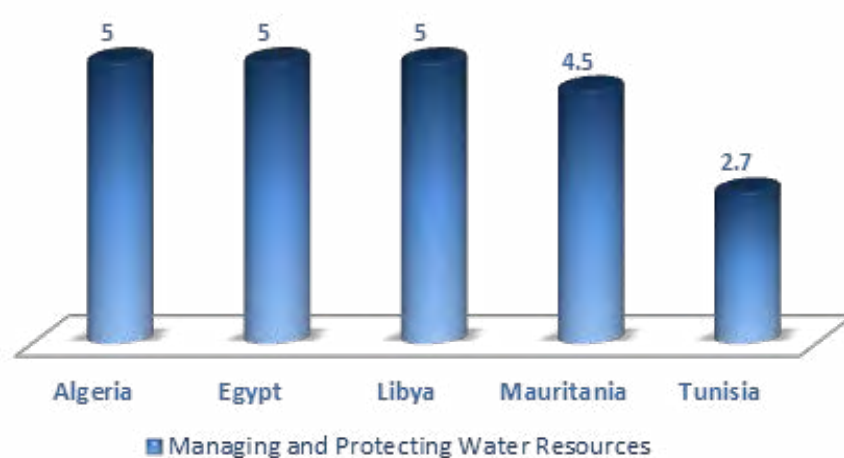


Figure 3. MEWINA Countries Performance in Pan-African M&E Theme 2

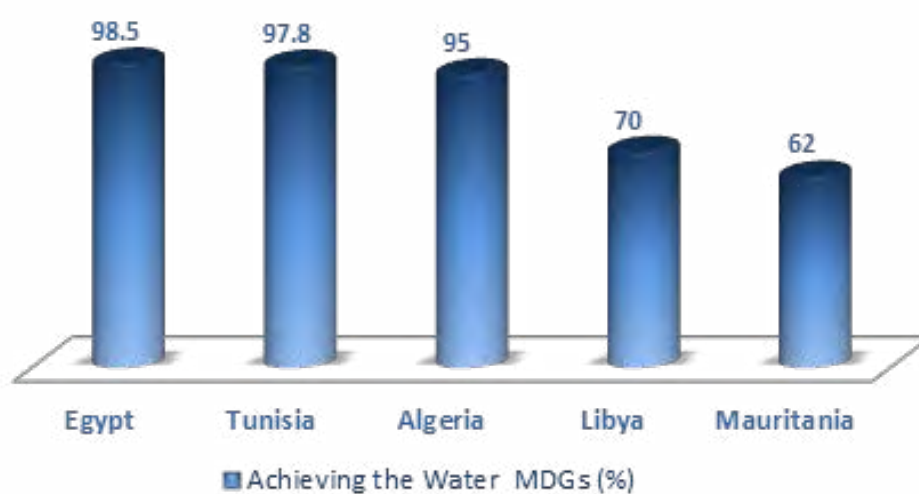


Figure 4a. MEWINA Countries Performance in Pan-African M&E Theme 3 for Water Supply

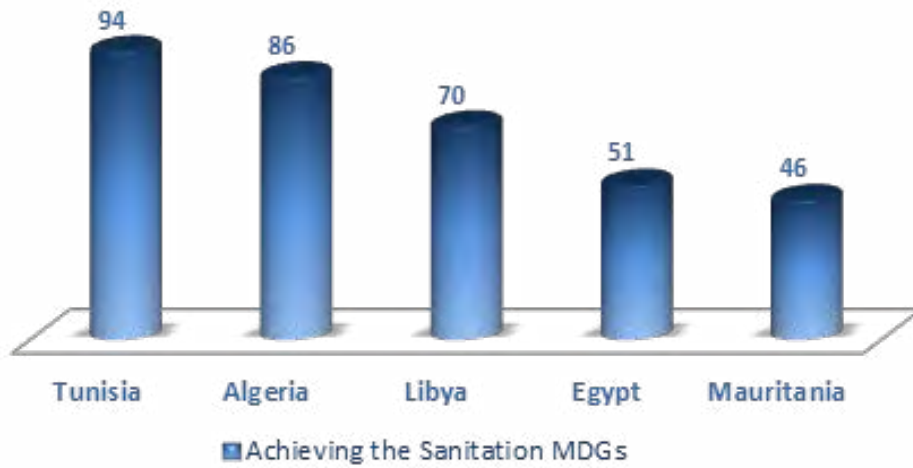


Figure 4b. MEWINA Countries Performance in Pan-African M&E Theme 3 for Sanitation

Figures (4a) and (4b) show the overall performance in theme 3 titled “Achieving the Water and Sanitation MDGs” and it is clear that the progress in sanitation coverage is affecting the overall progress in the theme for both Egypt and Mauritania.

Figure (5) shows the overall performance in theme 3 titled “Global Changes and Risk Management” and shows that all MEWINA countries are on track except Libya.

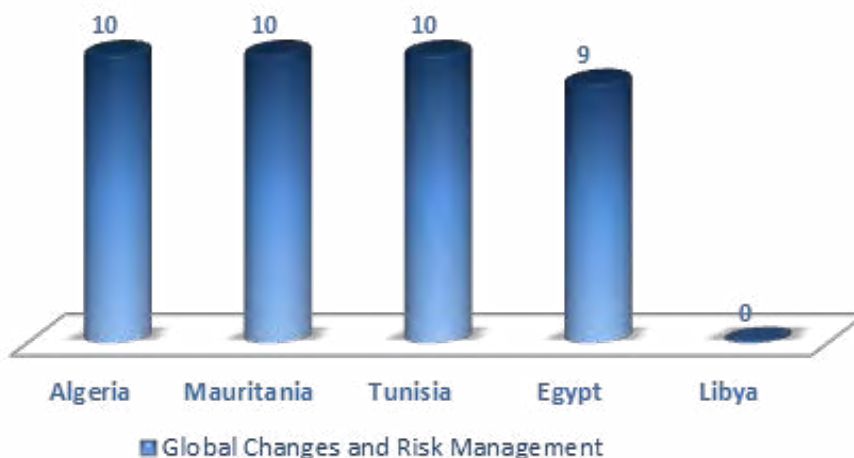


Figure 5. MEWINA Countries Performance in Pan-African M&E Theme 4

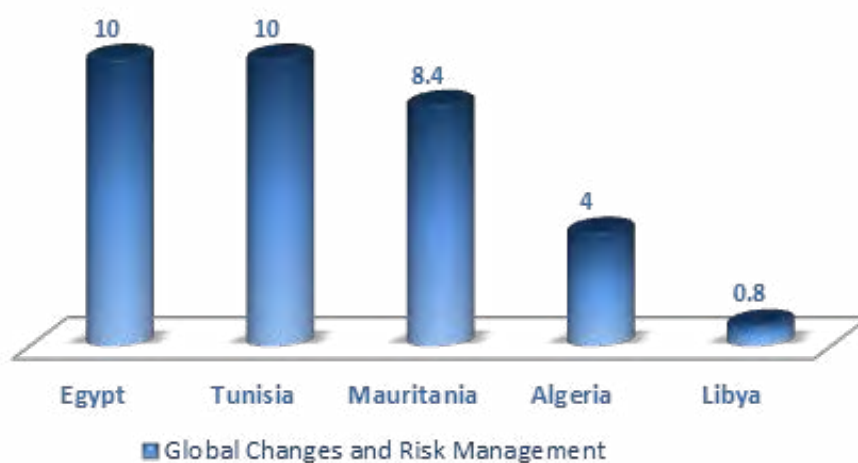


Figure 6. MEWINA Countries Performance in Pan-African M&E Theme 5

Figure (6) shows the different values related to theme 5 titled “Global Changes and Risk Management”, and reflects significant progress in Egypt and Tunisia.



Figure 7. MEWINA Countries Performance in Pan-African M&E Theme 6

Figure 7 shows the overall performance in theme 6 titled “Financing” and has the following Sub-themes: Percentage of GDP to Sanitation and Hygiene, Percentage of national Budget directed to Water and Sanitation, and Water and Sanitation Tariff systems. Egypt, Tunisia, and Mauritania are clearly not on track in relation to this theme, mainly because of the lack of advance towards the Percentage of National budget directed to Water and Sanitation.

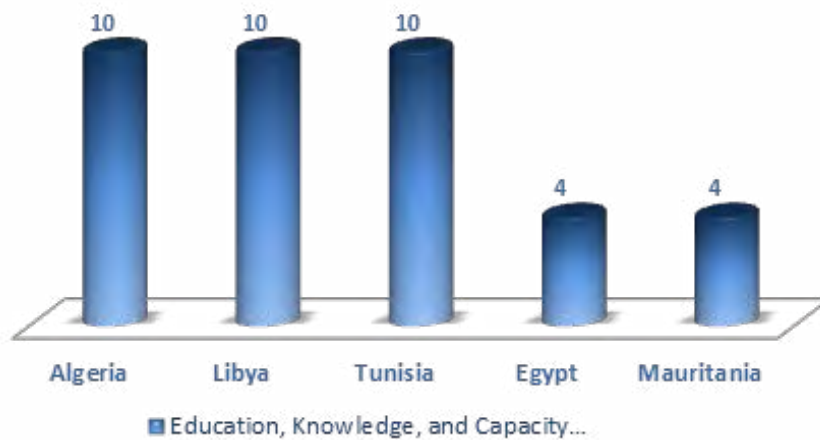


Figure 8. MEWINA Countries Performance in Pan-African M&E Theme 7

Figure (8) shows the MEWINA countries performance for theme 7 titled “Education, Knowledge, and Capacity Development” and shows that Egypt and Mauritania are significantly lagging behind other MEWINA Countries.

2.7. Overall Assessment of Countries Performance towards achieving MDG targets

The Joint Monitoring Programme (JMP) that is comprised of UNICEF and WHO is one of the main entities designated to monitor the progress made by all countries of the world towards achieving the Water MDGs. The progress made by the whole North Africa Region to which the five MEWINA countries belong is summarized here according to the JMP assessment. It is important to note that the values for Water Supply coverage and Sanitation coverage reported by JMP may differ from the official country reported values that will be presented later in this report. The discrepancy in these values is one of the main reasons as to why the standardization and Harmonization of indicators on National, Regional, and Global levels was set up as one of the important objectives of the MEWINA project.

Figure (9) shows that the drinking water coverage in North Africa was 92% in 2012 which is higher than the world average for the same year. Whereas, Figure (10) shows that the sanitation coverage in North Africa was 91% in 2012 which also exceeds the world’s average.

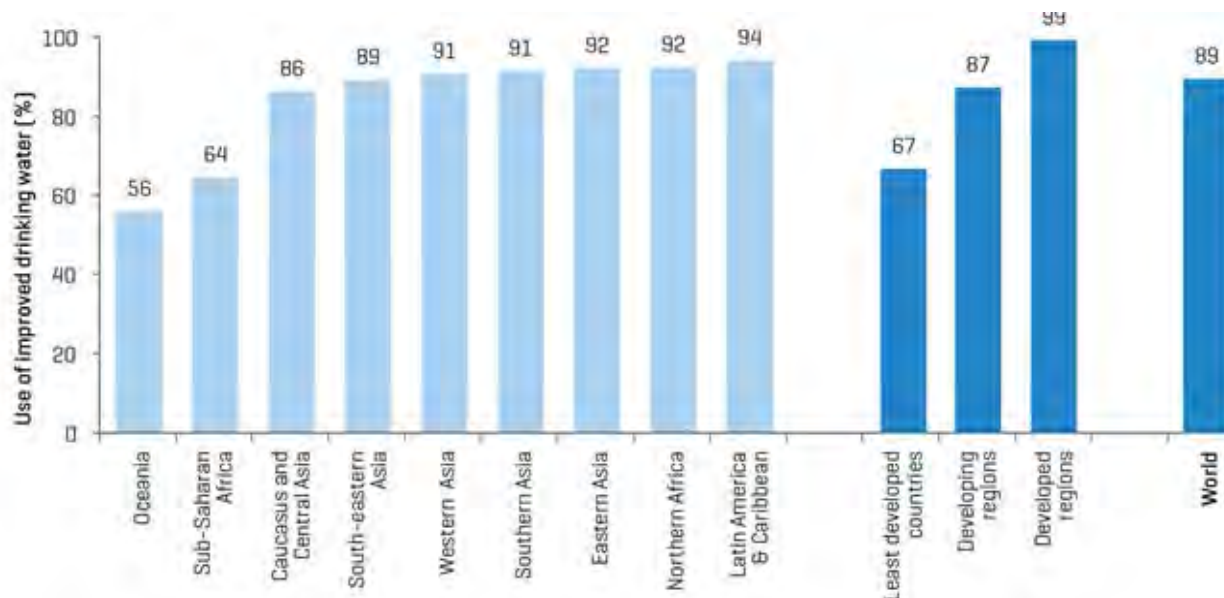


Figure 9. North Africa Water Supply Coverage in 2012 (JMP, 2014)

According to JMP, 13 Million People are without Improved Water Supply Coverage and 14 million are without improved Sanitation in North Africa as of 2012. On the other hand 68 MILLION People Gained Access to Improved Sanitation Since 1990.

Egypt and Tunisia met the Water Supply Target, while Algeria and Mauritania have not and are not on Track, there is no data for Libya.to infer on their progress in 2012. Also, Algeria, Egypt, and Tunisia met the sanitation Targets.Libya is on Track to the Sanitation Target, while Mauritania is not.

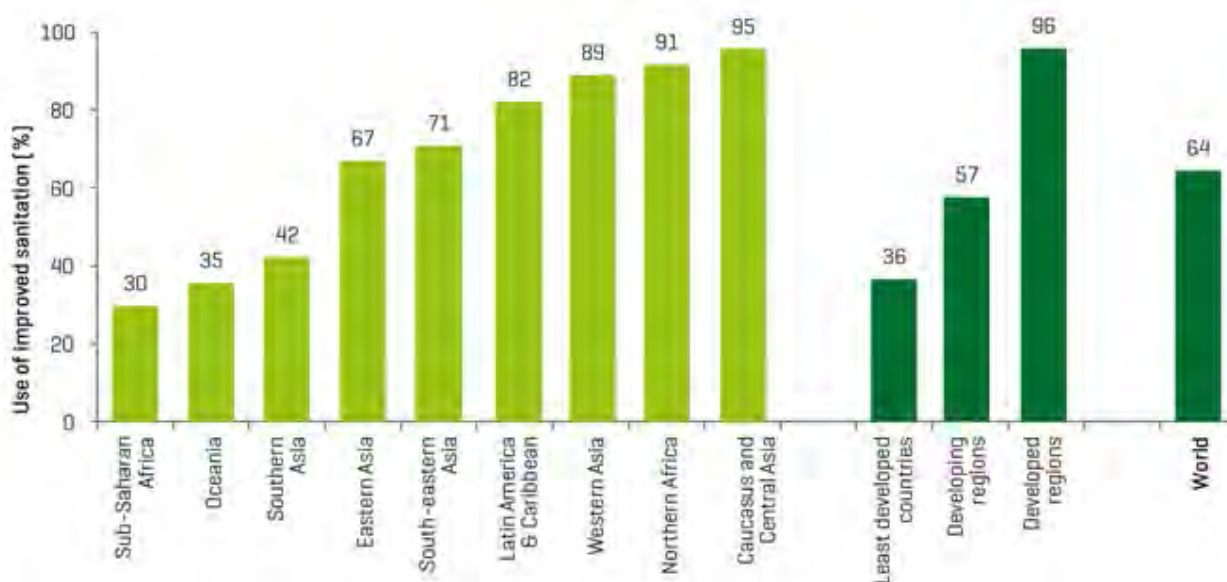


Figure 10. North Africa Sanitation Coverage in 2012 (JMP, 2014)

3. National SOW Indicators, Values, and Analysis

3.1. Water & Availability

This chapter presents the different indicators definitions and values, along with analysis. Unless otherwise mentioned, the values have been assessed and/or approved by the National MEWINA units according to the definitions indicated in the operational guidelines discussed during National Capacity building and State of the Water Consultation Workshops. The Values presented in this chapter are for the year 2012 which is the base year for the N-AMCOW State of the Water Reporting.

- **Annual Spatially Averaged Precipitation Depth:** Average precipitation over space in depth
- **Annual Precipitation Volume:** Average Precipitation over space in volume, it is the product of the Annual Average Precipitation Depth and the Effective Rainfall area.

I. Blue Water

The term “Blue Water” refers to all Surface and groundwater resulting from natural hydrological processes, and are voluntarily abstracted by different water use sectors, the term also applies to stored masses of water directly consumed by ecological systems.

- a) Internal Renewable Surface Water (IRSW):** The amount of precipitation that is neither beneficially abstracted by the green cover, nor infiltrated in the ground, but flows overland and routed through channels or joins bigger water bodies.
- b) Internal Renewable Groundwater (IRG):** Groundwater Recharge is the total volume of water entering underground sources of water (typically aquifers) within a country's borders from endogenous (internal) precipitation and surface water flow (FAO)
- c) Total Internal Renewable Blue Water Resources (TIRBWR)=(IRSW+IRG):** Annual flow of rivers and recharge of aquifers generated from endogenous precipitation. Double counting of surface water and groundwater resources is avoided by deducting the overlap from the sum of the surface water and groundwater resources. (FAO)
- d) External Surface Water Inflow (ESWI):** That part of the country's annual renewable surface water resources that are not generated in the country. It includes surface inflows from upstream countries, and part of the water of border lakes and/or rivers without human influence
- e) External Surface Water Outflow (ESWO):** Annual quantity of Surface water leaving the country's boundaries to another country.
- f) External Groundwater Inflow (EGI):** Quantity of groundwater annually entering the country naturally
- g) External Groundwater outflow (EGO):** Annual quantity of groundwater leaving the country (FAO)
- h) Total External Renewable Blue Water Resources (TERBWR)=(ESWI+EGI):** The portion of

the country's renewable water resources which is not generated within the country (FAO).

- i) **Total Renewable Blue Surface Water (TRBSW)**=(IRSW)+(ESWI)-(ESWO): Is the resultant of the internal produced surface water and the transboundary inflows and outflows of surface water.
- j) **Total Renewable Blue Groundwater (TRBG)**=(IRG)+(EGI)-(EGO): Is the resultant of the internal produced groundwater and the transboundary inflows and outflows of groundwater.
- k) **Overlap between surface water and Groundwater (OSW)**: Part of the renewable freshwater resources that is common to both surface water and groundwater. It is equal to groundwater drainage into rivers (typically, base flow of rivers) minus seepage from rivers into aquifers. (FAO)
- l) **Total Renewable Blue Water Resources (TRBWR)** = (TRBSW) + (TRBG)-(OSW): Is the sum of total renewable blue surface and groundwater excluding the overlap between them.
- m) **Total Exploitable Non-Renewable Ground Water Resources**: The annual extractable amount of non-renewable groundwater according to a pre specified safe yield that is dictated by a pre-specified sustainability period (x number of years) and a maximum allowable drawdown at the end of the sustainability period.
- n) **Total Blue Water Resources**: The sum of total Renewable and Non-Renewable Blue Water Resources

II. Green Water

The term “Green Water” refers to the portion of beneficial abstractions of renewable water resources from green cover which comes from atmospheric water directly and is consumed by rain-fed agriculture, natural pasture, and forests (AbuZeid, 2008). Sustainable, water-dependent, socio-economic development will simply not be possible without taking an integrated perspective on all water-dependent and water impacting activities in a river basin and their relative upstream\downstream relations (Falkenmark, 1999). Total Green water consumptions are divided into: Rain-fed areas consumptions, Pasture areas consumptions, and Forest Areas consumptions. For the purpose of this report the following methodology will be used in estimating the total consumption for each of the three different kinds of areas that collectively represent the total Green Water Consumption:

- **(R)** is a Reference value calculated as the ratio between irrigation withdrawals and the irrigated agriculture area in the same country
- **Alpha** is a coefficient (from 0-1) function of the prevailing aridity and the plant cover (e.g. **0.2** for hyper arid regions, **0.5** for arid regions, **0.7** temperate regions, and **1.0** for tropical areas)
- The **Rainy Period Coefficient** for Rain-fed Agriculture is function of the rainy months (e.g. 3 months is “**0.25**” of a year, a value of “**1.0**” for 12 rainy months)
- Average Vegetation consumptions for the North African region = Area of Vegetation * (R) * Alpha * Rainy Period Coefficient

- a) **Water for Rain-fed Agricultural Consumptions:** The total amount of precipitation directly consumed by rain fed agriculture.
- b) **Water for Rain-fed Pasture Consumptions:** The total amount of precipitation directly consumed by pasture areas.
- c) **Water for Rain-fed Forest Consumptions:** The total amount of precipitation directly consumed by forests.
- d) Total Renewable Green Water Resources: $a+b+c$
- e) Total Renewable Water Resources (TRWR)= $(TRBWR+TRGWR)$

The Total Renewable Water Resources is hence calculated as the sum of the total Blue Water described in the previous sub-section and the total Green Water.

III. Non-Conventional Water

- a) **Produced Municipal Wastewater (PMW):** Annual quantity of wastewater generated in the country, in other words, the quantity of water that has been polluted by adding waste. The origin is domestic use (used water from bathing, sanitary, cooking, etc.) wastewater routed to the wastewater treatment plant. It does not include agricultural drainage water, which is the water withdrawn for agriculture but not consumed and returned to the system” (Modified from FAO)
- b) **Produced Industrial Wastewater (PIW):** Annual quantity of wastewater generated in the country, in other words, the quantity of water that has been polluted by adding waste. The origin is industrial wastewater routed to the wastewater treatment plant. It does not include agricultural drainage water, which is the water withdrawn for agriculture but not consumed and returned to the system” (Modified from FAO)
- c) **Treated Municipal and Industrial Wastewater:** Quantity of generated municipal and industrial wastewater that is treated in a given year and discharged from treatment plants (effluent). (Modified from FAO)
- d) **Produced Agricultural Drainage (PAD):** Total volume of the water withdrawn for agriculture but not consumed and flows out of the system (modified from FAO).
- e) **Produced Desalinated Water (PDW):** Water produced annually by desalination of brackish or salt water. (Modified from FAO).
- f) **Total Non-Conventional Water Resources (TNCWR)= (PMW)+(PAD)+(PDW)**
- g) **Total Conventional Water Resources(TCWR)= TRWRR+TNRGR**
- h) **Total Available Water Resources (TAWR) = TCWR+TNCWR**

Table 6 shows the indicator Values for the “Water & Availability” Indicators Category.

Table 6. Water & Availability Indicators Values

No	Code	Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	1	Water & Availability							
1	1-1	Annual Spatially Averaged Precipitation Depth	MM/Year	56	51	46	223.90	153	105.98
2	1-2	Annual Precipitation Volume	BCM/Year	134	0.97	75.10	94.82	23.70	328.59
*	*	Blue Water							
3	1-3	Internal Renewable Surface Water (IRSW)	BCM/Year	11	0	0.03	0.1	2.7	13.83
4	1-4	Internal Renewable Groundwater (IRG)	BCM/Year	2.50	6.37	0.6	0.3	1.5	11.27
5	1-5	Total Internal Renewable Blue Water Resources (TRBWR)=(IRSW+IRG)	BCM/Year	13.50	6.37	0.63	0.4	3.85	24.75
6	1-6	External Surface Water Inflow (ESWI)	BCM/Year	0.12	55.5	0	11	0.3	66.92
7	1-7	External Surface Water Outflow (ESWO)	BCM/Year	0.3	0	0	0	0.19	0.49
8	1-8	External Groundwater Inflow (EGI)	BCM/Year		0	0	0	0.1	0.1
9	1-9	External Groundwater outflow (EGO)	BCM/Year		0	0	0	0	0
10	1-10	Total External Renewable Blue Water Resources Inflow(TERBWR)=(ESWI+EGI)	BCM/Year		55.5	0	11	0.4	66.9
11	1-11	Total Renewable Blue Surface Water (TRBSW)=(IRSW)+(ESWI)-(ESWO)	BCM/Year	11	55.5	0.03	11.1	2.83	64.56
12	1-12	Total Renewable Blue Groundwater (TRBG)=(IRG)+(EGI)-(EGO)	BCM/Year	2.50	6.37	0.6	0.3	1.6	11.37
13	1-13	Overlap between Surface Water and Groundwater (OSWG)	BCM/Year	0	6.37	0.1	0	0.4	6.87
14	1-14	Total Renewable Blue Water Resources (TRBWR)=(TRBSW)+(TRBG)-(OSW)	BCM/Year	13.50	55.5	0.53	11.4	4.02	84.95
15	1-15	Total Exploitable Non-Renewable Groundwater (TNRG)	BCM/Year	2	2.4	1.79	0	0.65	6.84
16	1-16	Total Blue Water Resources (TBWR)	BCM/Year		57.9	2.31	11.40	4.67	
*	*	Green Water							
17	1-17	Water for Rain-fed Agricultural Consumption	BCM/Year	3	0.41	2.35	0.04	5.50	11.30
18	1-18	Water for Rain-fed Pasture Consumption	BCM/Year	52.8	0	20.12	3.94	6	82.86
19	1-19	Water for Rain-fed Forest Consumption	BCM/Year	9	0.26	0.26	0.02	1.5	11.04
20	1-20	Total Renewable Green Water Resources (TRGWR)	BCM/Year	64.80	0.67	22.73	4	13	105.20
21	1-21	Total Renewable Water Resources (TRWR)=(TRBWR+TRGWR)	BCM/Year	78.30	56.17	23.26	15.4	17.02	190.15
22	1-22	Total Conventional Water Resources (TCWR)= TRWR+TNRG = TBWR+TRGWR	BCM/Year	80.30	58.57	25.04	15.4	17.67	196.98
*	*	Non-Conventional Water							
23	1-23	Produced Municipal Wastewater (PMW)	BCM/Year	1.2	6.50	0.50	0.08	0.24	8.52
24	1-24	Produced Industrial Wastewater (PIW)	BCM/Year		4.20			0.037	
25	1-25	Produced Agricultural Drainage (PAD)	BCM/Year	0	20.6	0.90	0.37	0.14	22.01
26	1-26	Produced Desalinated Water (PDW)	BCM/Year	0.54	0.16	0.01	0.03	0.03	0.77
27	1-27	Total Non-Conventional Water Resources (TNCWR)= (PMW)+(PIW)+(PAD)+(PDW)	BCM/Year	1.74	34.98	1.41	0.48	0.41	39.02
28	1-28	Total Available Water Resources (TAWR) = TCWR+TNCWR	BCM/Year	34.34	93.55	26.45	15.88	18.08	188.3

From an insightful look at to table.6, the general impression is that all countries have responded actively to the regionally accepted and harmonized “Water & Availability” indicators. The levels of successful

reporting on different indicators categories have differed drastically, ranging from full indicators reporting as in the case of Water & Availability and minimal reporting as in the case of Water & Governance.

All the indicators under The Water& Availability category have been properly assessed, the spatially averaged Precipitation depth is shown in Figure (11a) where it is clear that Mauritania has the highest Precipitation depth, and the average depth of all MEWINA countries is 105.98 mm. Figure (11b) shows the precipitation depth distribution in the whole region, where it is clear that the highest precipitation (above 550 mm) occurs in the Northernmost areas of the Region as well as southern Mauritania. The spatially varied annual precipitation volume in all MEWINA countries was found to be 328.59 BCM as shown in Figure (12) which also shows that Algeria has the maximum precipitation volume of 134 BCM which is also reflected in the value of total Internal Renewable water Resources shown in Figure (13). As for the Total Renewable Blue Water Resources that comprises the total Internal Renewable Water Resources and the Total External Renewable Water Resources, it is found that Egypt has the highest value as it has the highest dependence on External Blue Water Resources. Figure (14) shows that the Total Renewable Blue Water Resources in the Whole N-AMCOW Region is around 85 BCM with Egypt having the highest rank for this indicator followed by Algeria, and then Mauritania which has the second highest dependence on External Renewable Blue Water.

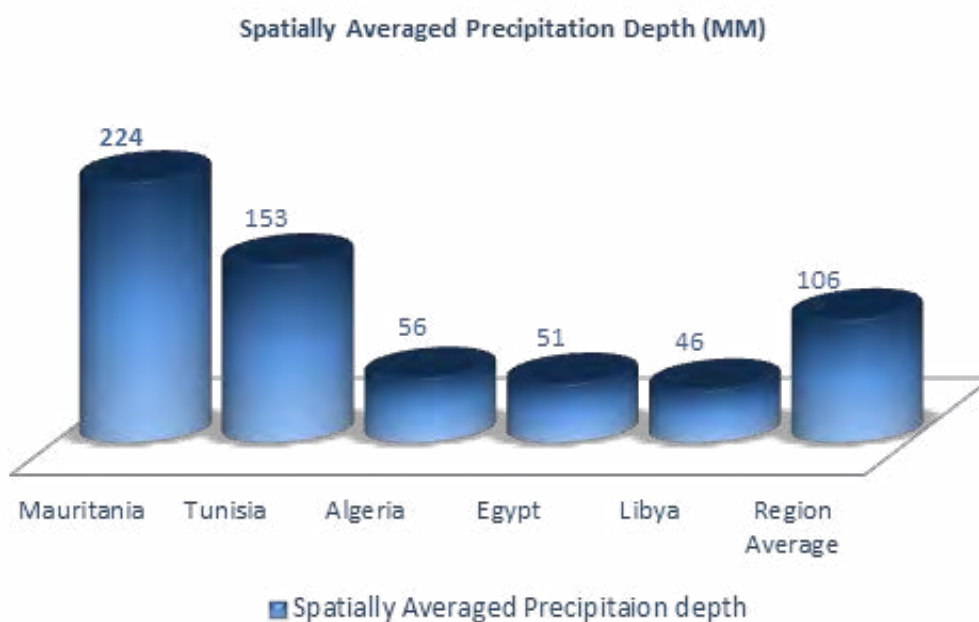


Figure 11a. Spatially Varied Precipitation Depth

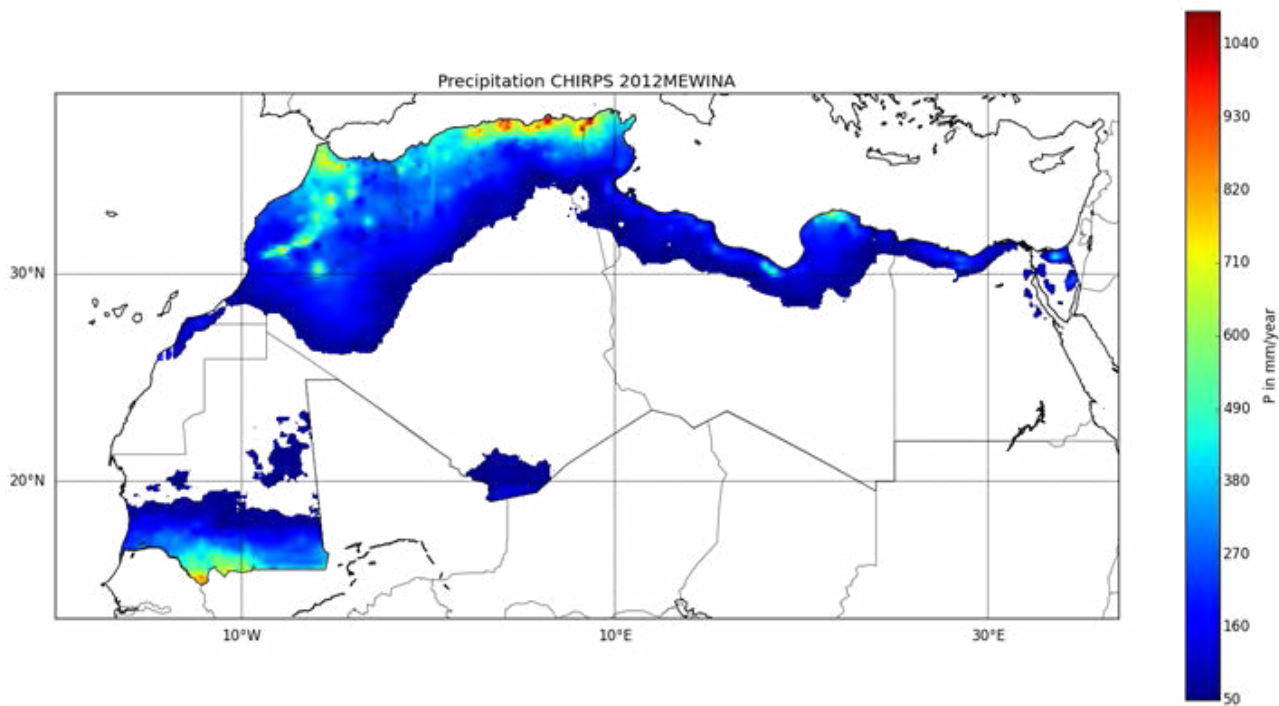


Figure 11b. Precipitation Depth Distribution in the N-AMCOW Region

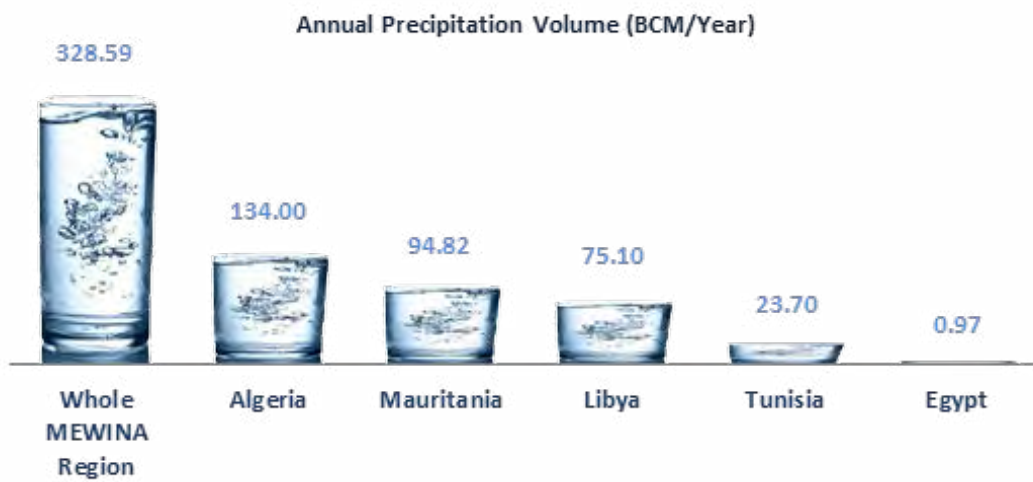


Figure 12. Annual Precipitation Volume

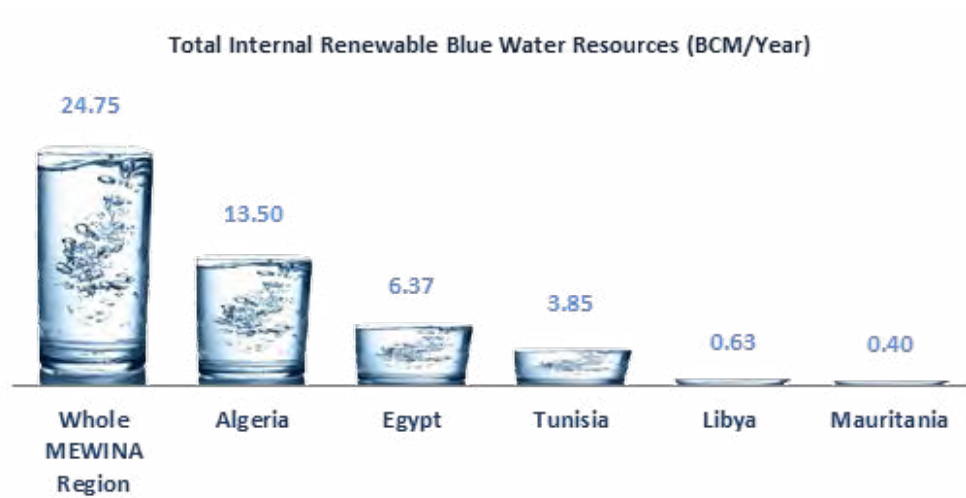
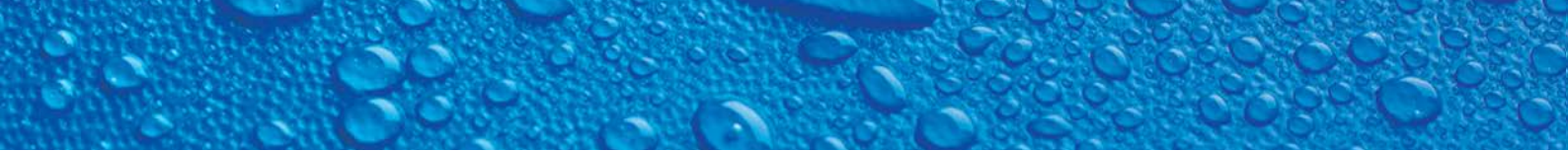


Figure 13. Total Internal Renewable Blue Water Resources

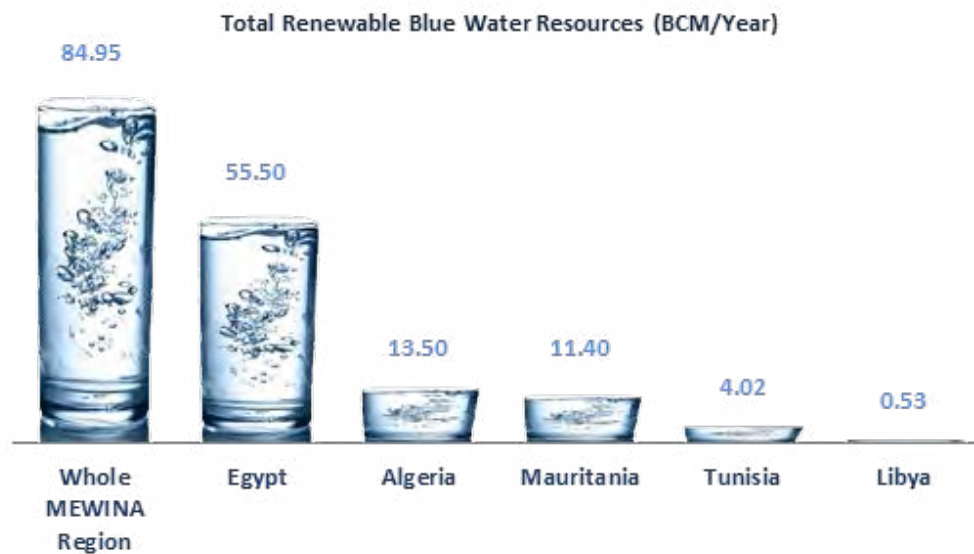


Figure 14. Total Renewable Blue Water Resources

The Non-Renewable Blue Water Resources are comprised of fossil groundwater that has been trapped in Aquifers for thousands of years; those aquifers are not recharged by precipitation or percolation from Surface Water flow. Non-Renewable Groundwater is a significant source of Water in four of the MEWINA countries as shown in Figure (15). For the most part, the Annual non-renewable Groundwater Resources were assessed based on a sustainability period of 100 years and a maximum draw down at the end of the sustainability period ranging from 50 to 100 meters.

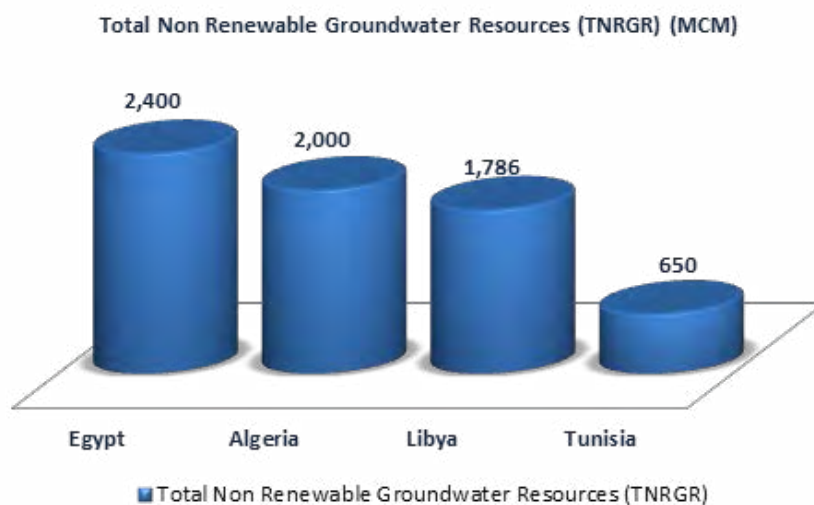


Figure 15. Total Non-Renewable Water Resources in the N-AMCOW Region

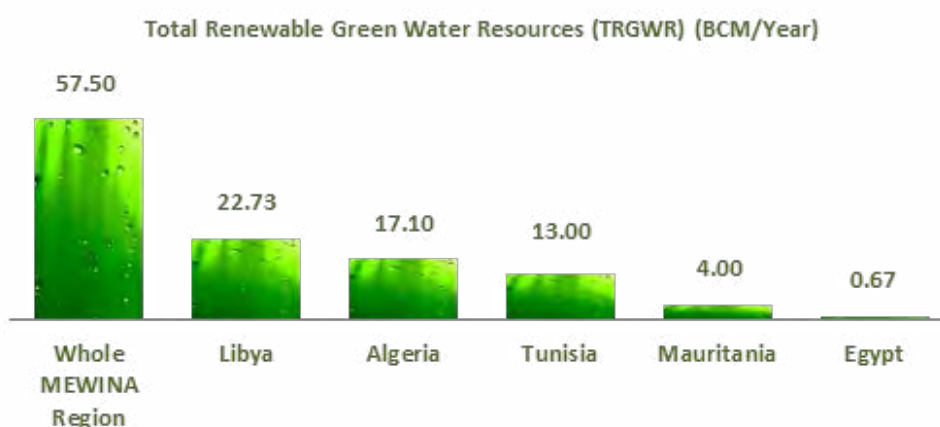


Figure 16. Total Green Water Resources in the N-AMCOW Region

The Total renewable Green Water Resources indicator was assessed using the empirical approach elaborated in chapter 3 for rain-fed agriculture, pasture land, and forests. Figure (16) shows that the total Renewable Green Water Resources in the N-AMCOW Region is around 58 BCM.

The importance of Green Water Use for Green cover is emphasized in Figure (17) which shows the amounts of Green Water used for rain-fed agriculture, natural pasture, and forests area, and the amounts of Blue Water used for Irrigation in the N-AMCOW Region. While Egypt depends almost entirely on Blue Water for green cover, green water contributes significantly to the water Resources of other MEWINA countries.

Although the commonly used practices consider Blue Water only when assessing the Total Renewable Water Resources, the MEWINA project adopts a significantly more precise approach where the “Total Renewable Water Resources” is the sum of the Total Renewable Blue and Green Water Resources. Figure (18) shows the values of the “Total Renewable Water Resources” considering both Blue and Green Water, which is the approach adopted by the MEWINA project and this report and the values of the

“Total Renewable Blue Water Resources”, which is commonly considered the “Total Renewable water Resources”. It is clear that all MEWINA countries except Egypt depend to different extents on Green Water.

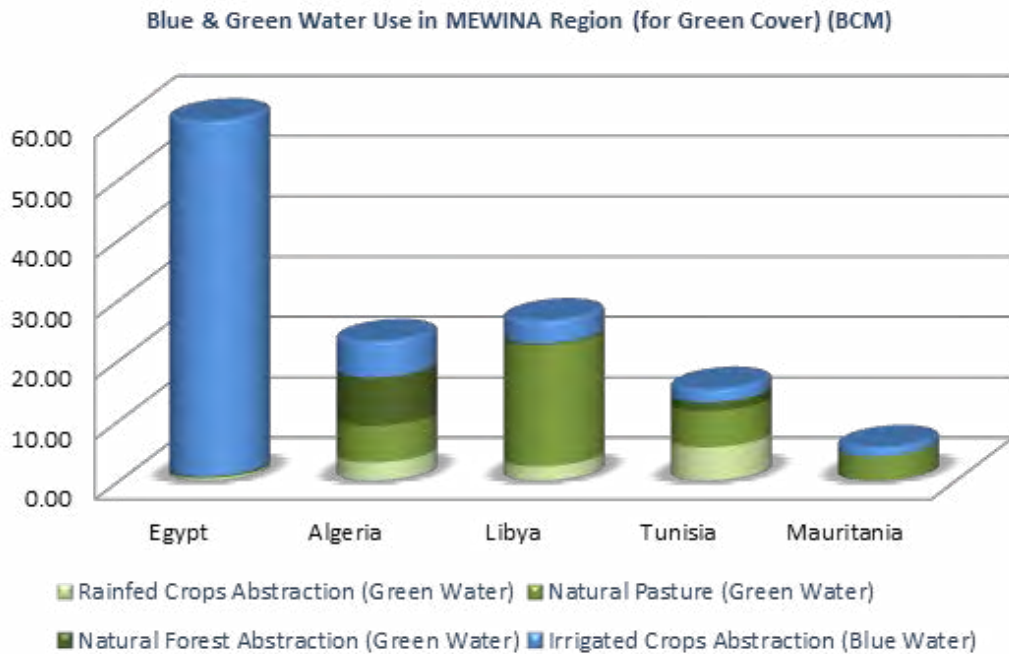


Figure 17. Blue and Green water Use for Green Cover in the N-AMCOW Region

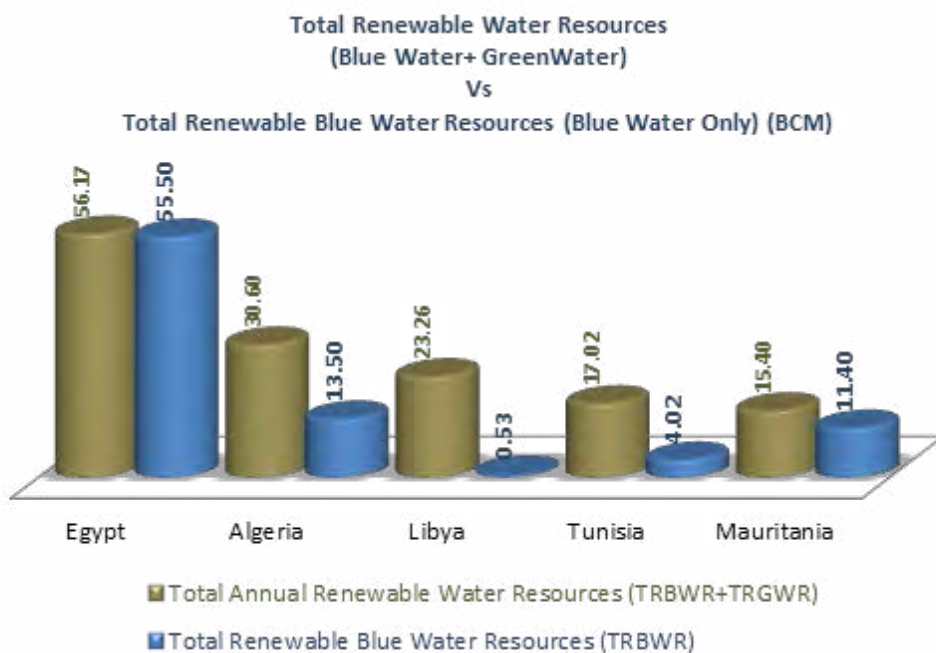


Figure 18. Total Renewable Water Resources in the N-AMCOW Region

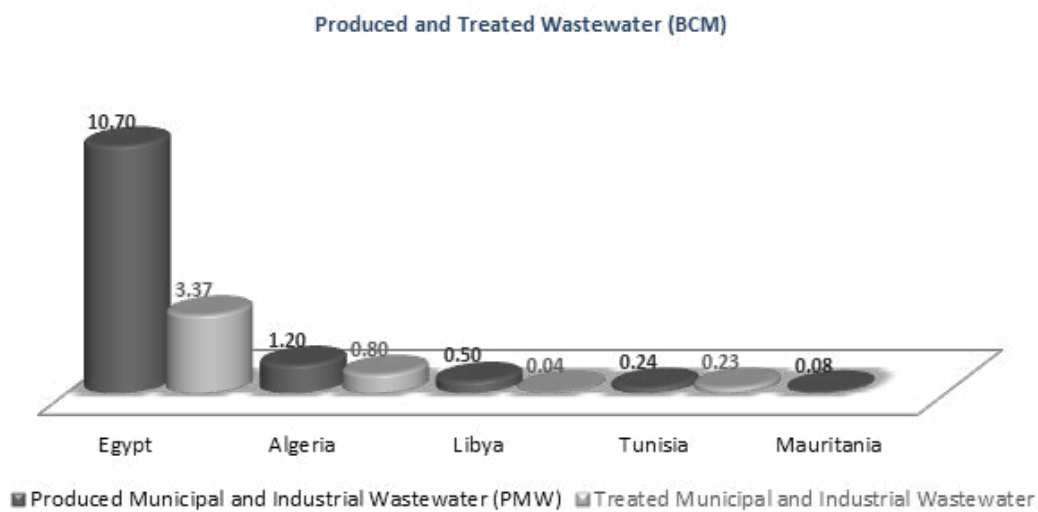


Figure 19. Produced and Treated Wastewater in the N-AMCOW Region

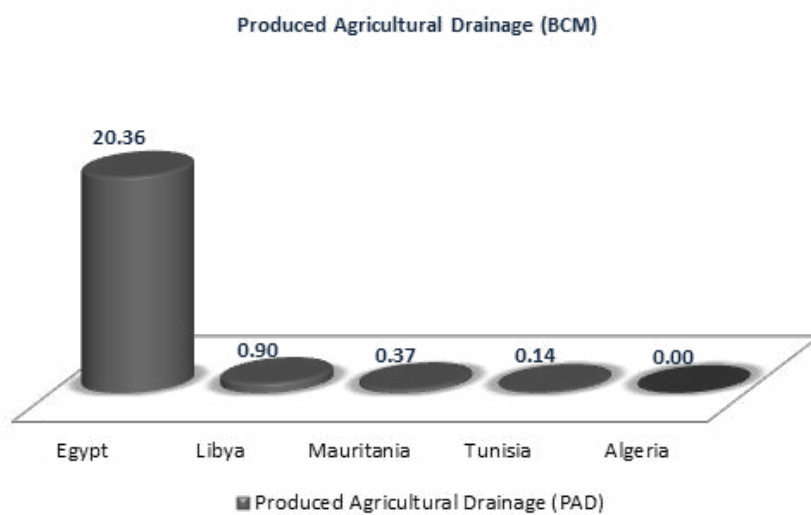


Figure 20. Produced Agricultural Drainage in the N-AMCOW Region

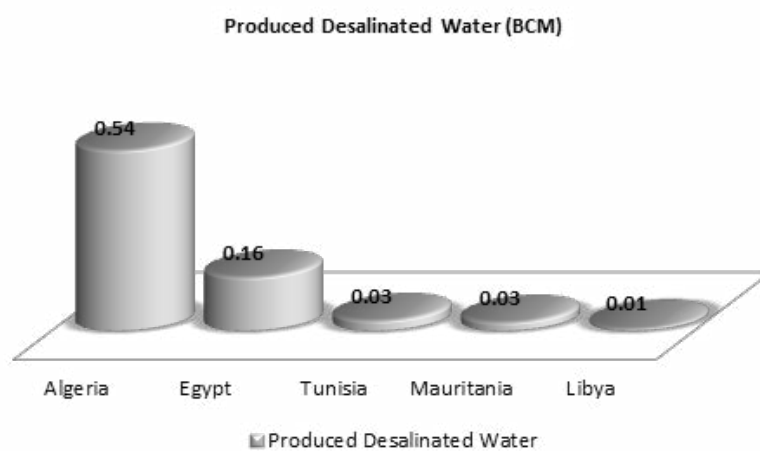


Figure 21. Produced Desalinated Water in the N-AMCOW Region

Non-Conventional water Resources consist mainly of Produced Municipal and Industrial Wastewater, Produced Agricultural Drainage, and Desalinated Sea Water. The Values FOR MEWINA countries for these three indicators are shown in Figures (19), (20), and (21), respectively. Figure 19 shows also the volumes of treated Municipal and Industrial Wastewater. It is clear that Egypt produces the highest wastewater due to its high population. Although, Egypt has the highest value for treated Wastewater volumes, Tunisia and Algeria are far more progressed in terms of the ratio of treated to produced wastewater. That ratio is 96% in Tunisia, 66 % in Algeria, but only 51% in Egypt. On the other hand, Egypt has the highest volume of produced Agricultural Drainage as shown in Figure (20), almost all of that volume is being reused. Figure (21) shows the desalinated sea water volumes in the MEWINA countries, and it is clear that the volumes Algeria desalinates are double the volumes desalinated by all MEWINA countries altogether.

Examining table (6) and looking at the N-AMCOW Region as a whole, it is clear in Figure (22) that most of the Region's Green Water is beneficially consumed by Pasture land. Figure (23) on the other hand shows that 5% of the Region's blue water is non-renewable.

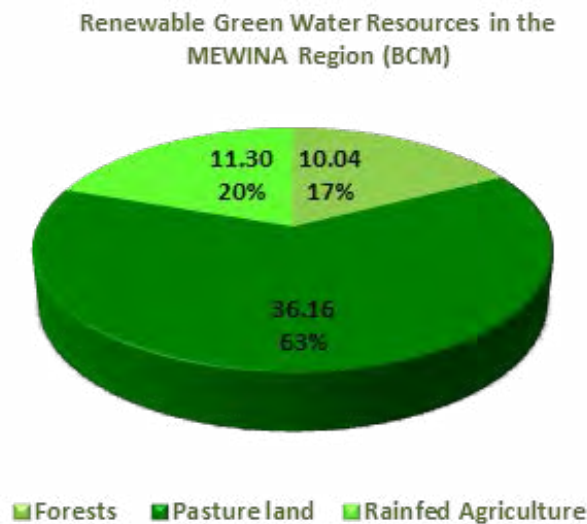


Figure 22. Green water Resources in the N-AMCOW Region

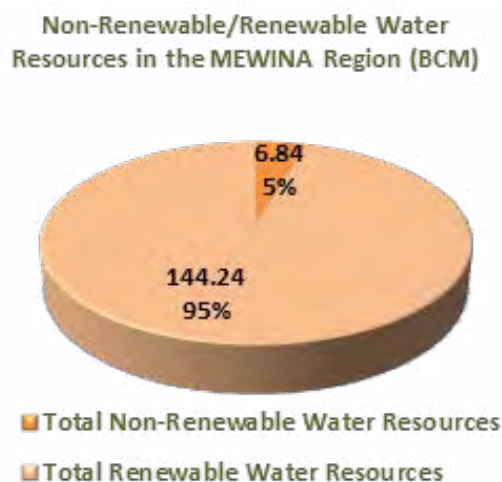


Figure 23. Renewable and Non-Renewable Water Resources in the N-AMCOW Region

Figure (24) divides the Total Annual Renewable Water Resources in the N-AMCOW Region into Blue and Green Renewable Water Resources and shows that Green Water Resources occupies 40% of the Total Renewable Water Resources in the Arab Region.

As far as Non-Conventional Water Resources are concerned, the whole N-AMCOW Region utilizes around 35 BCM of Non-Conventional water (Desalinated water, treated wastewater, and Agricultural Drainage) as opposed to around 197 BCM of Conventional Water as shown in Figure (25). With the exception of a small portion that amounts to 3%, the total amount of non-conventional water resources in the N-AMCOW Region is mainly divided between produced municipal and industrial wastewater and Produced Agricultural Drainage that comprise 27% and 70%, of non-conventional Water resources, respectively, as shown in figure (26). Both volumes are considered non-conventional Water Resources as they can be utilized by different sectors after various degrees of treatment that differ according to the type of use.

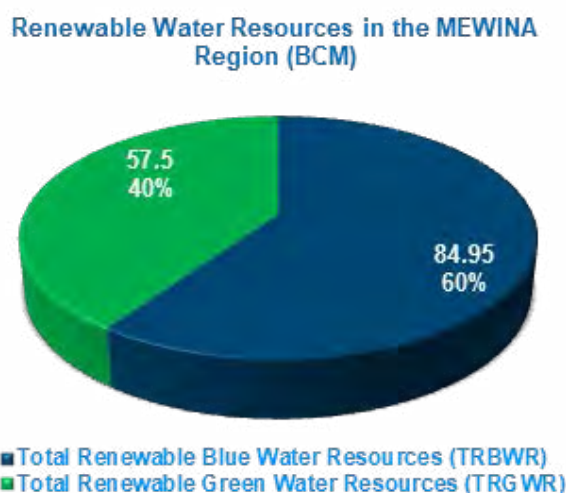


Figure 24. Renewable Water Resources in the N-AMCOW Region

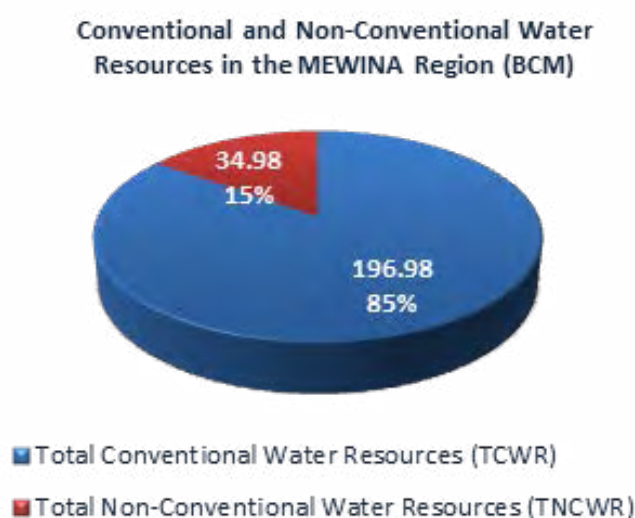


Figure 25. Conventional and Non-Conventional Water Resources in the MEWINA Countries

Non-Conventional Water resources in Egypt (BCM)

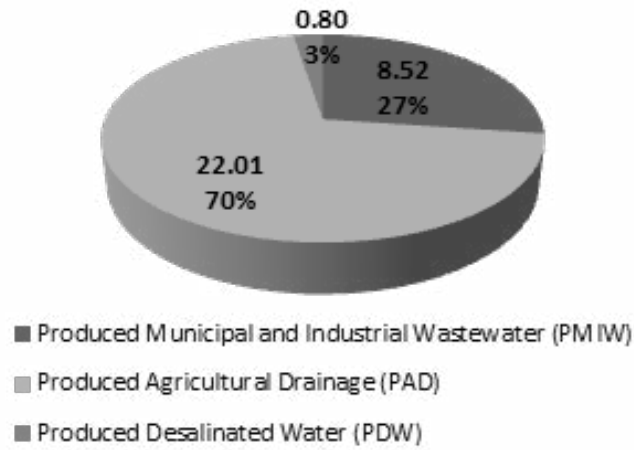


Figure 26. Total Non-Conventional Water Resources in the MEWINA Countries

The Total Available Water Resources comprises the Total Renewable Water Resources, the Total non-renewable Water Resources, and the Total Non-Conventional Water Resources. From Figure (27) it is clear that Egypt has the highest Available Water Resources which could be partially attributed to the efforts exerted in terms of developing non-conventional water resources, and the external renewable blue surface water from the Nile River. The Total Available Water Resources indicator may be neither representative nor informative if the demographical element is not introduced. Therefore, the indicators under the “Water & Population” Category are of great importance.

Total Available Water Resources (TAWR) (BCM/Year)

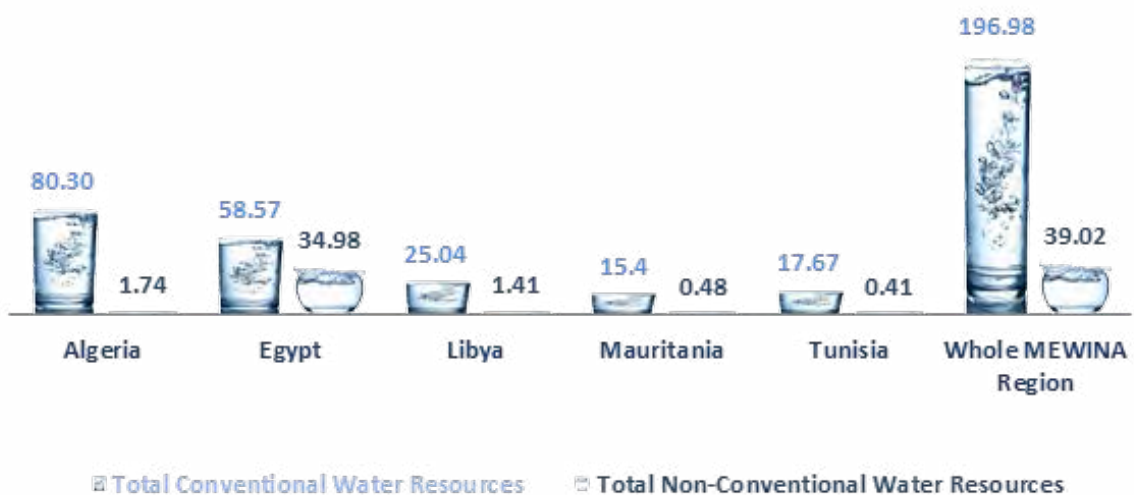


Figure 27. Total Available Water Resources (TAWR)

3.2. Water & Uses

The indicators under this category are listed below:

- a) **Annual Total water withdrawal:** The gross amount of water extracted from all sources, either permanently or temporarily, for all uses. It can be either diverted towards distribution networks or directly used. It includes consumptive use, conveyance losses, and return flow” “modified from Earth Trends’
- b) **Withdrawals by the Domestic sector:** Total annual volume of water withdrawals used for domestic purposes.
- c) **Withdrawals by the Industrial sector:** Total annual volume of water withdrawals used for industrial purposes.
- d) **Withdrawals by the Agricultural sector:** Total annual volume of water withdrawals used for industrial purposes.
- e) **Agricultural Consumption from Green Water:** The total volume of green water annually consumed by rain-fed agriculture.
- f) **Total Agricultural Water Use:** The total annual volume consumed by both rain-fed and irrigated agriculture.
- g) **Withdrawals from Blue Surface water:** Annual gross amount of water extracted from rivers, lakes and reservoirs. It includes withdrawal of primary renewable surface water resources and secondary freshwater sources (water previously withdrawn and returned).” (FAO)
- h) **Withdrawals from Blue Groundwater:** Total abstractions from groundwater sources, including nonrenewable sources per year
- i) **Withdrawals from Blue Renewable Groundwater:** Total annual volumes abstracted from renewable resources.
- j) **Withdrawals from Blue Exploitable Non-renewable Groundwater:** Total annual volumes abstracted from non-renewable resources, namely, fossil groundwater.
- k) **Total withdrawals from Blue Water: $h+i+j$**
- i) **Agricultural Drainage Water Reuse:** The total volume of agricultural drainage that is returned back to the system through reuse.
- l) **Withdrawals from Desalinated Water:** The Total Volume of Water actually desalinated in a given year.
- j) **Reused Treated Municipal Wastewater:** Quantity of Municipal treated wastewater that is reused in a given year.
- k) **Reused Treated Industrial Wastewater:** Quantity of treated Industrial wastewater that is reused in a given year.
- m) **Withdrawals from non-conventional resources:** Total volumes abstracted annually from water resources other than surface and groundwater, namely, treated wastewater, reused Agricultural Drainage, and desalinated sea water

- n) **Annual Volume of Total Actual Evapotranspiration:** Equal to the total renewable green water resources
- o) **Green Water Consumption for livestock Fodder Water Use:** Is the total volume of green water consumed by livestock, could be calculated by identifying the average number of heads for each kind of livestock and the average annual consumption per head, and calculating the sum of the products of the number of heads and average annual consumption for each type.
- p) **Inland Fisheries and Aquaculture Demands:** The Total Volume of Water used for Inland Fisheries and Aquaculture.
- q) **Navigation demands:** The Total Volume of Water Reserved for Inland Navigation.
- r) **Evaporation Losses:** The total Volume of Water lost by Evaporation.
- s) **Bottled Water Production:** The Total volume of Water bottled for the purpose of commercial sale.
- t) **Water Demand for Environmental Uses:** The Total volume of water used to sustain and preserve ecological systems.
- u) **Withdrawals for Oil and Gas Water Use:** The total annual volume withdrawn for Oil and Gas Water use.

Table 7 shows the indicator values under the “Water & Uses” category.

Table 7. Water & Uses Indicator Values

NO	Code		Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	2	Water & Uses							
29	2-1	Withdrawals for Domestic Water Use	BCM/Year	3	9.6	0.63	0.15	0.5	13.88
30	2-2	Withdrawals for Industrial Water Use	BCM/Year	0.65	4.4	0.07	0.5	0.09	5.71
31	2-3	Withdrawals for Agricultural Water Use	BCM/Year	6	61	3.8	1.5	2.17	74.47
32	2-4	Annual Total Water Withdrawals	BCM/Year	12.65	76.36	4.71	2.15	2.71	98.58
33	2-5	Green Water Consumption for Agriculture Water Use	BCM/Year	3	0.41	2.35	0.04	5.5	11.3
34	2-6	Total Agricultural Water Uses	BCM/Year	9	61.41	6.15	1.54	7.67	85.77
35	2-7	Withdrawals from Blue Surface Water	BCM/Year		75.97	0	1.5	0.62	
36	2-8	Withdrawals from Blue Renewable Groundwater	BCM/Year		6.37	4.71	0.1	1.51	
37	2-9	Withdrawals from Blue Non-Renewable Groundwater	BCM/Year	2	2.4	4.35	0	0.61	9.36
38	2-10	Total Withdrawals from Blue Water	BCM/Year		84.74	4.71	1.6	2.66	
39	2-11	Agricultural Drainage Water Reuse	BCM/Year	0	14.16	0		0.02	
40	2-12	Withdrawals from Desalinated Water	BCM/Year	0.54	0.16	0.007		0.03	
41	2-13	Total Withdrawals from Non-Conventional Water Resources	BCM/Year		17.72	0.013	0.0003	0.11	
42	2-14	Annual Volume of Total Actual Evapotranspiration	BCM/Year			22.73			
43	2-15	Greenwater Consumption for Livestock Fodder Water Use	BCM/Year			0.06		6	
44	2-16	Inland Fisheries & Aquaculture Demands	BCM/Year		0.4	0			
45	2-17	Navigation Demands	BCM/Year		0.1	0			
46	2-18	Evaporation Losses	BCM/Year		2.4	0.029			

NO.	Code		Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
47	2-19	Bottled Water Production	BCM/Year			0.003		0.001	
48	2-20	Water Demand for Environmental Uses	BCM/Year						
49	2-21	Withdrawals for Oil & Gas Water Use	BCM/Year			0.38			

Figure (28) shows the water withdrawals for different water use sectors in the MEWINA countries, where it is clear that Agriculture has the biggest share in all MEWINA countries, while Figure (29a) shows the amounts of water used for Agriculture from both Green and Blue Water. It is clear that Tunisia has the highest rank in Agricultural dependence on Green Water among all MEWINA countries.

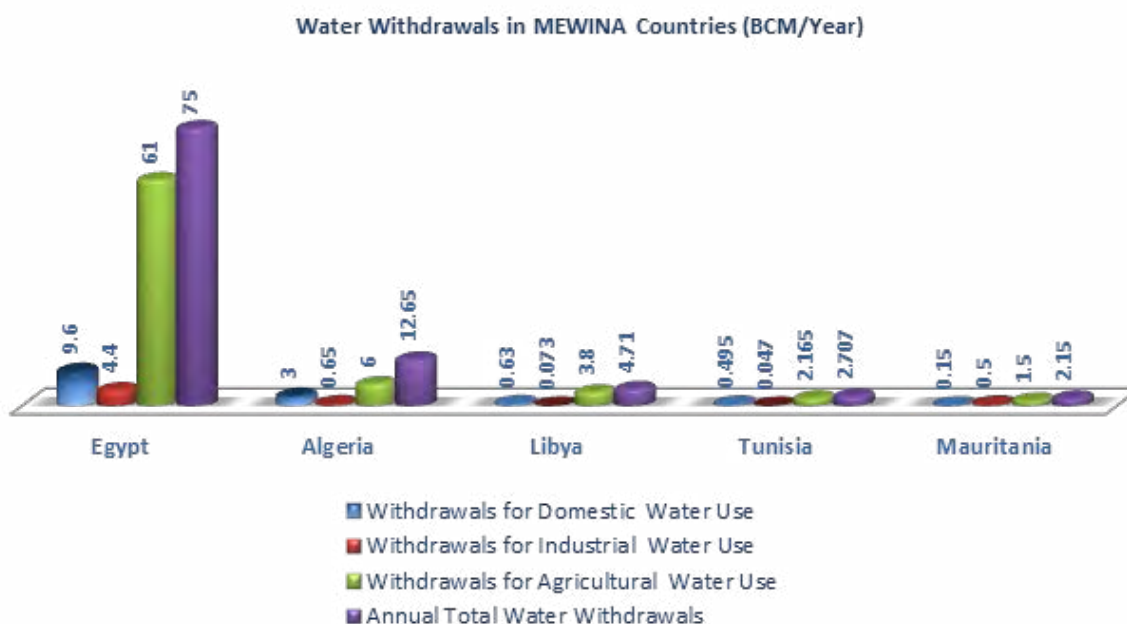


Figure 28. Water Withdrawals in MEWINA Countries

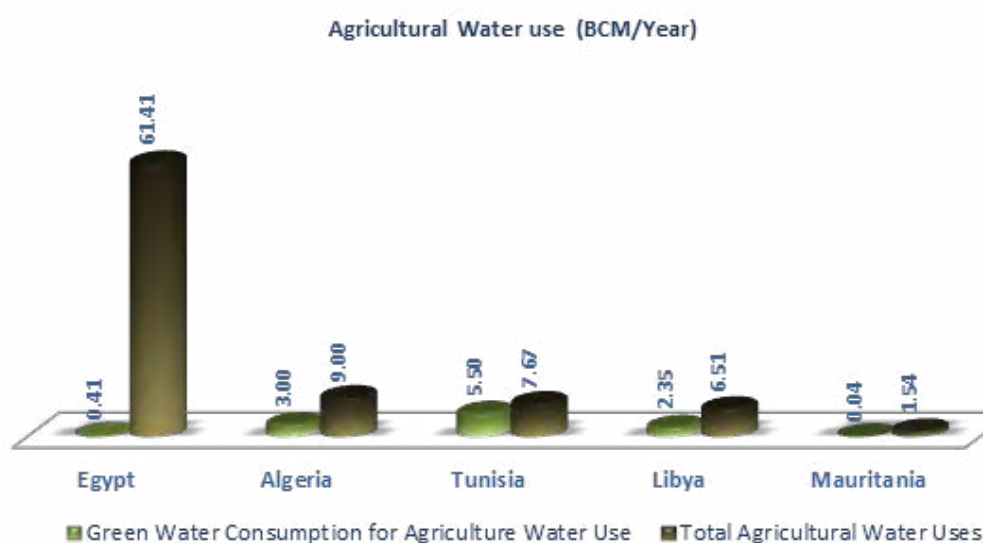


Figure 29a. Agricultural Water Use

Figures (29b) through (29e) give a clear image of water use by different kind of land uses. The Evapotranspiration (ET) accounts for the sum of beneficial uses and Evaporation for each type of Land Use. The ET from rain-fed areas prevails mostly in the northernmost part of the Region (Figure (29b)), which agrees with the precipitation patterns shown in Figure (11b). The available data for Irrigated areas ET (Figure (29c) show that the highest values are observed in the Nile Delta and Nile Valley of Egypt , where Agriculture is entirely dependent on irrigation water, while ET from Barren Land reaches a maximum value of 240 mm/year in the North parts of Libya, Tunisia, and Algeria (Figure (29d)). Figure (29e) shows the available data for the ET from open water bodies.

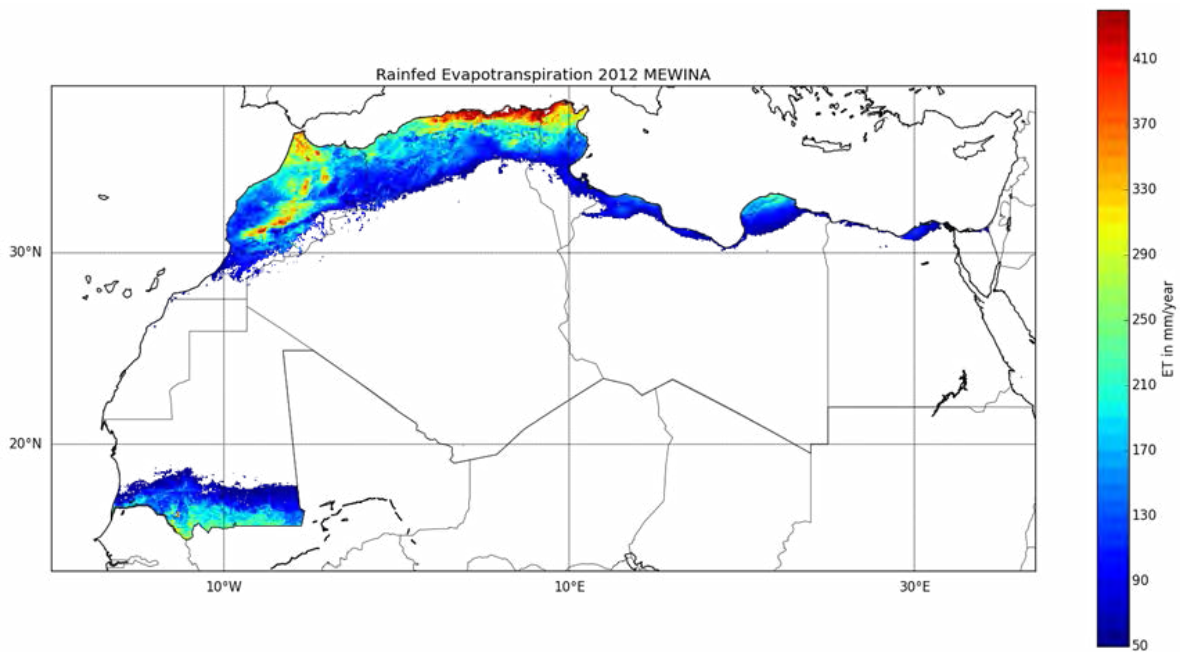


Figure 29b. Rainfed ET in N-AMCOW Region

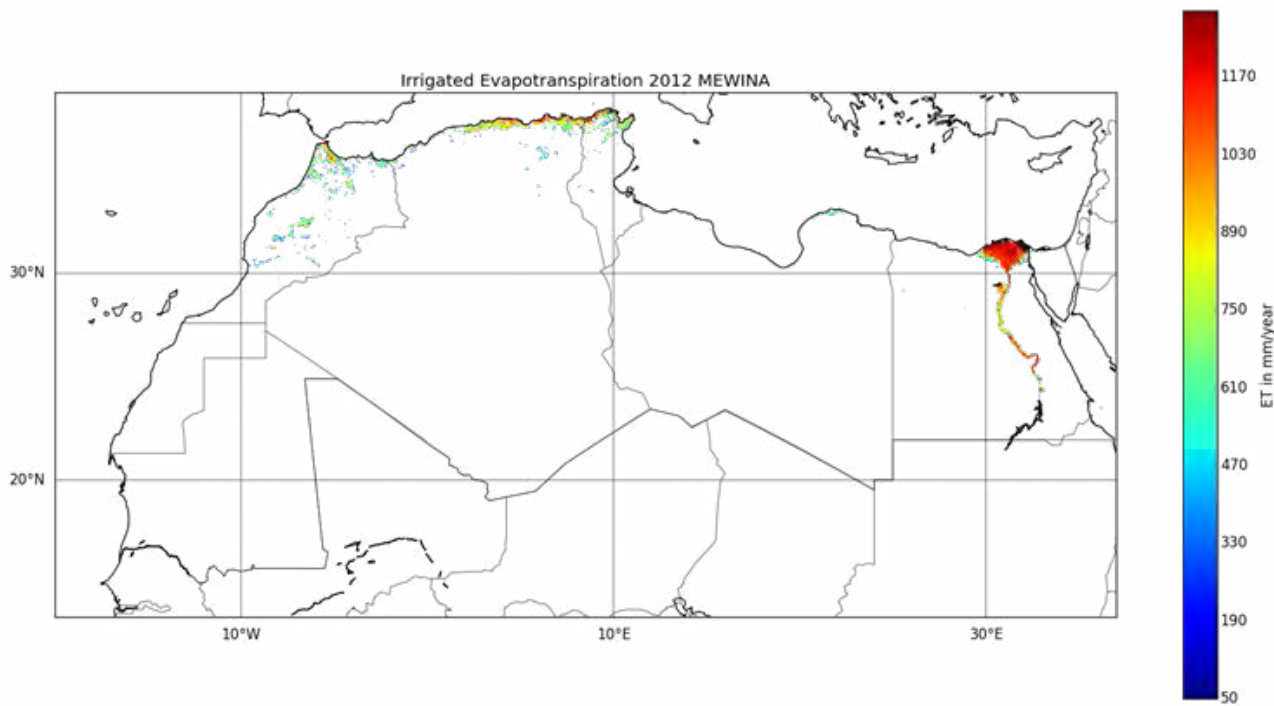


Figure 29c. Irrigated ET in N-AMCOW Region

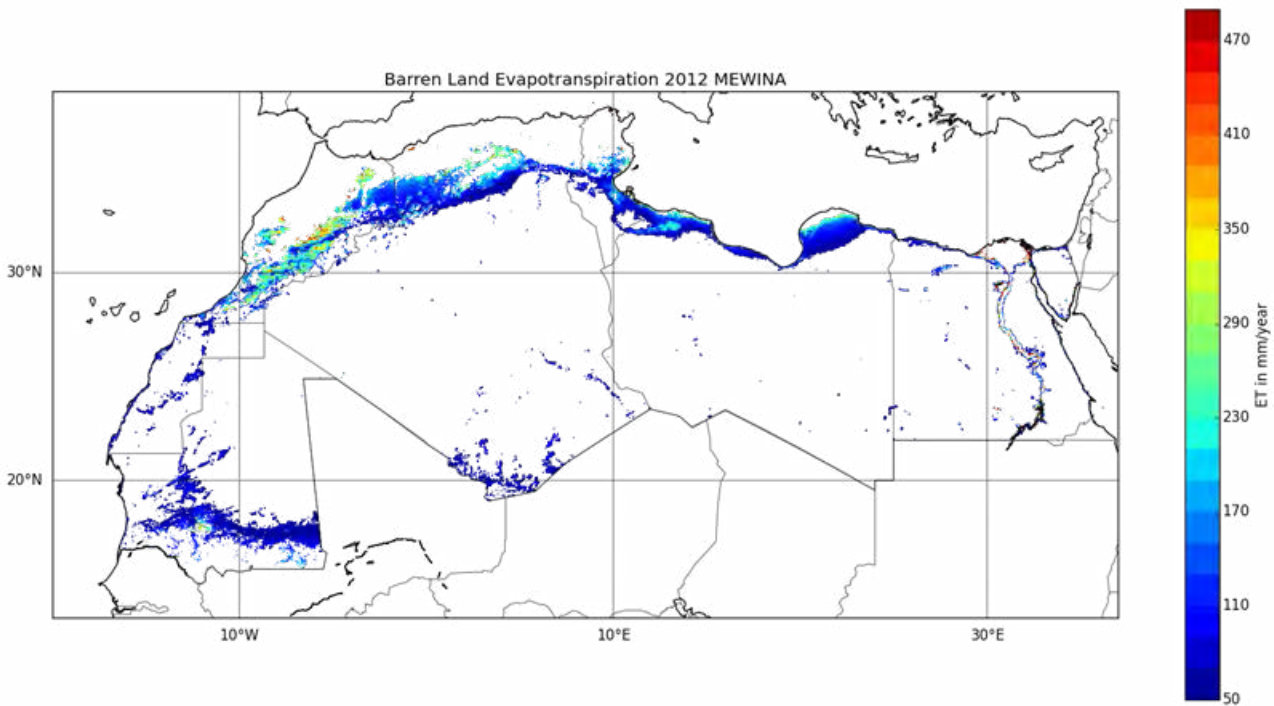


Figure 29d. Barren Land ET in N-AMCOW Region

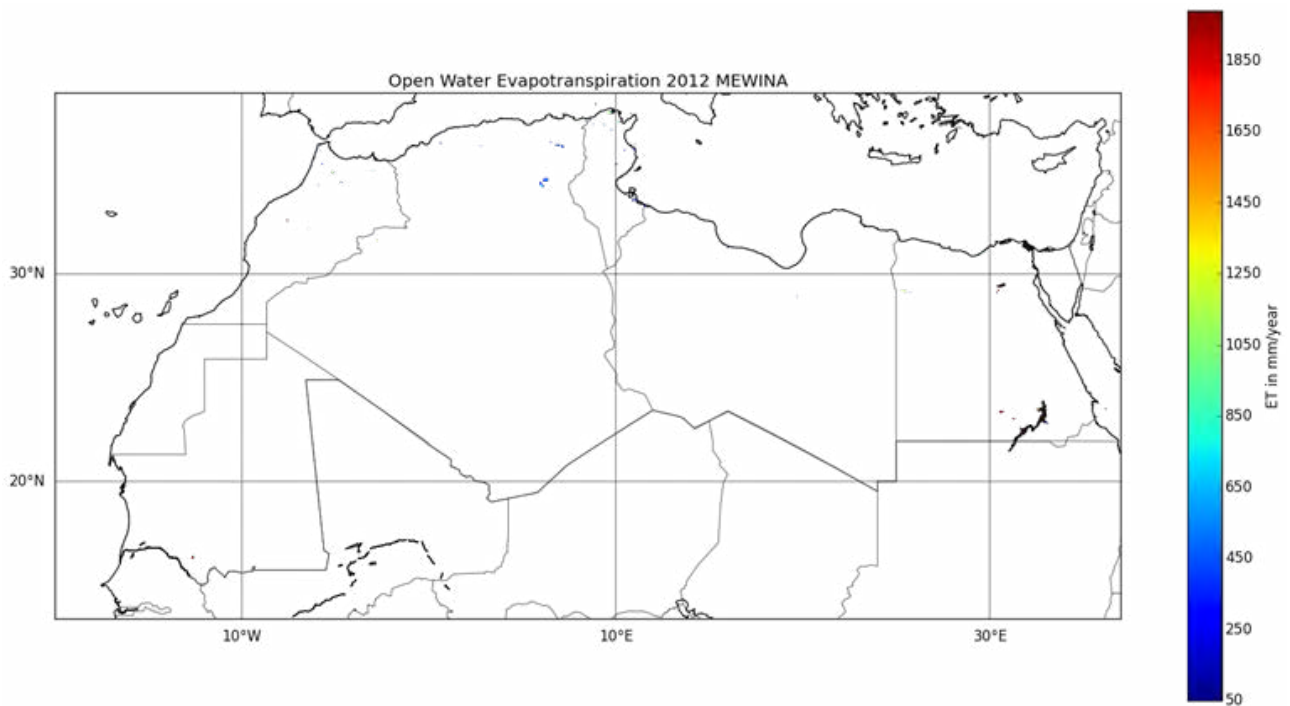


Figure 29e. Open Water Bodies ET in N-AMCOW Region

Figure (30) shows the total amounts of Blue and Green Water used for Agriculture in the whole N-AMCOW Region where it is clear that 13% of the agricultural water is Green.

Agricultural use from Blue and Green Water in the MEWINA Region (BCM)

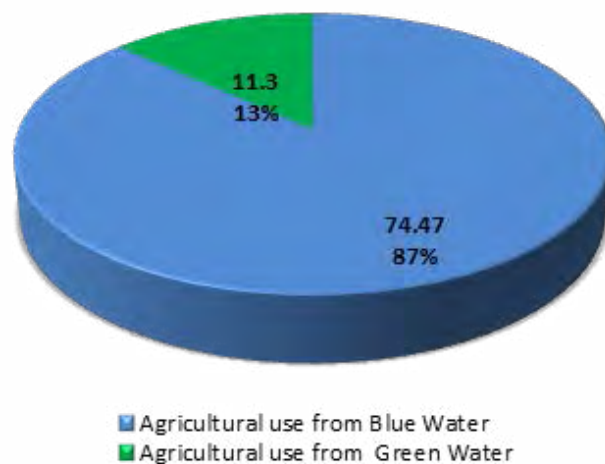


Figure 30. Blue and Green Water Use in Agriculture in the Whole N-AMCOW REGION

3.3. Water & Land-Use Changes

The following indicators will be considered:

- a) **Total Irrigated Agricultural land:** Total agricultural area that is managed by irrigation systems.
- b) **Total Rain-fed Agricultural land:** The total rain-fed agricultural area
- c) **Total Pasture area**
- d) **Total Forests area**
- e) **Urban Encroachment on Green Cover:** Is the loss of Green Cover caused by urbanization, and is expressed by agricultural area lost/ year.
- f) **Impact of Urban Encroachment on agricultural land:** Is the amount of water resources gained or lost due to urban encroachment on agricultural lands and is assessed through the following indicators:
 - **The decrease in Groundwater recharge:** Defined as total volume of water that would have naturally entered underground sources of water (typically aquifers) in the Urbanized areas from endogenous (internal) precipitation and surface water flow, had urbanization not taken place (FAO)
 - **The increase of surface runoff:** Under the assumption that most of the volume that used to infiltrate to the root zone will be changed into surface runoff due to the drastic difference in permeability between agricultural land and asphalt, the increase of surface runoff is estimated as 80-90% of the decrease in the amount of water infiltrated to the root zone in rain-fed agriculture.
 - **The decrease in water consumptions of Green Cover:** defined as the product of the green cover area lost due to urban encroachment and the average consumption of the unit area.
 - **The increase in domestic water withdrawals:** Defined as the total volume used by the population that re-located to the abused areas which is given by the product of the estimated population and the annual average domestic water consumption per capita (100-200 cubic meters).

Table 8 shows the values of the Land Use related indicators.

Table 8. "Water & Land Use Changes" Indicator values

No.	Code		Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	3	Water & Land Use Changes							
50	3-1	Total Irrigated Agricultural Land	ha	1,053,000	3,620,158	610,000	31,000	420,000	5,734,158
51	3-2	Total Rain-fed Agricultural Land	ha	7,401,630	159,000	1,489,000	245,000	4,953,550	14,248,180
52	3-3	Total Pasture Land	ha	32,943,690	0	14,833,000	14,429,800	4,895,000	67,101,490
53	3-4	Total Forests Land	ha	4,268,110	99,500	338,000	242,000	4,500,775	9,448,385
54	3-5	Urban Encroachment on Green Cover	ha lost/Year			3600		10,000	

No.	Code		Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	*	Impact of Urban Encroachment on water Resources (Indicators listed below)							
55	3-6	Decrease in Groundwater Recharge	BCM/Year			0.0009		0.00126	
56	3-7	Decrease in Water Consumptions of Green Cover	BCM/Year			0.005		0.030	
57	3-8	Increase in Surface Runoff	BCM/Year			0.005		0.03126	
58	3-9	Increase in Domestic Water Withdrawals	BCM/Year			0.009		0.030	

Figure (31) shows the different land uses in MEWINA countries, where it is clear that Natural pasture is the prevailing land use among all green water consuming land uses. Figure (32) shows the Land Use Distribution for the whole N-AMCOW Region. 70% of the Region is Pasture Land.

The Urban encroachment on Green Cover is one of the very common phenomena in the N-AMCOW Region (Figure 33a shows the Egyptian Case). An effort was made to assess the deforestation in Mauritania and it amounted to 5000 ha annually, where 2000 of them are being revived as forests. Libya has reported that 3600 hectares of Green Cover were lost to Urbanization while Tunisia reported 10,000 Hectares.

As for the impact of Urban Encroachment on Green Cover on Water Resources, the increase in surface runoff was 0.005 BCM in Libya and 0.03 BCM in Tunisia, while the decrease in Ground Water Recharge was estimated as 0.0009 BCM in Libya and 0.00126 BCM in Tunisia. Figures (33b) and (33c) show the impact of Land Use change due to the collective effects of agriculture expansion, deforestation, and urban encroachment on green cover between 2011 and 2012, and also between 2001 and 2012 on the Groundwater Recharge and Surface water runoff, respectively, represented in mms/year, according to the Fraction approach (Bastiannsen and Hoftse, 2015).

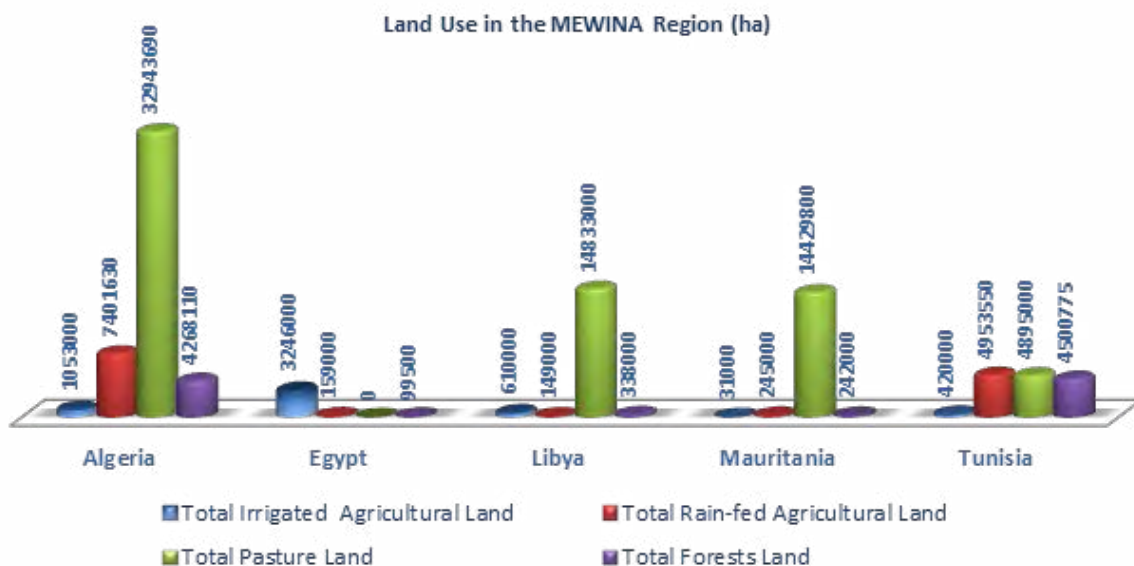


Figure 31. Land Use in the N-AMCOW Region

Land Use in the MEWINA Region (BCM)

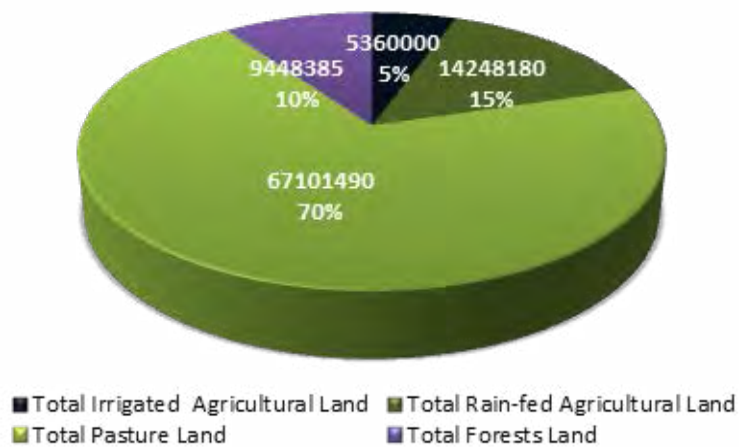


Figure 32. Overall Land Use in the Whole N-AMCOW Region



Figure 33a. Urban Encroachment in Nile Delta, Egypt

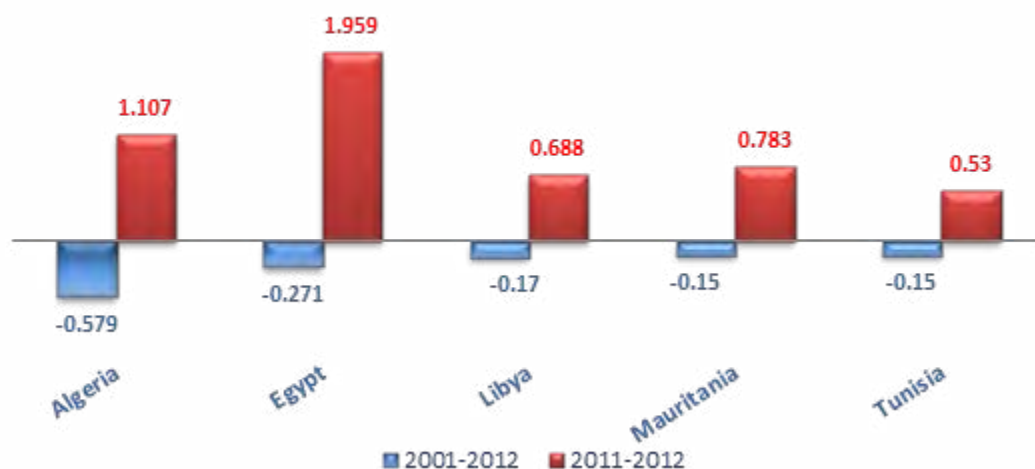


Figure 33b. Impact of Green cover Land Use change on Groundwater Recharge (mm/year)

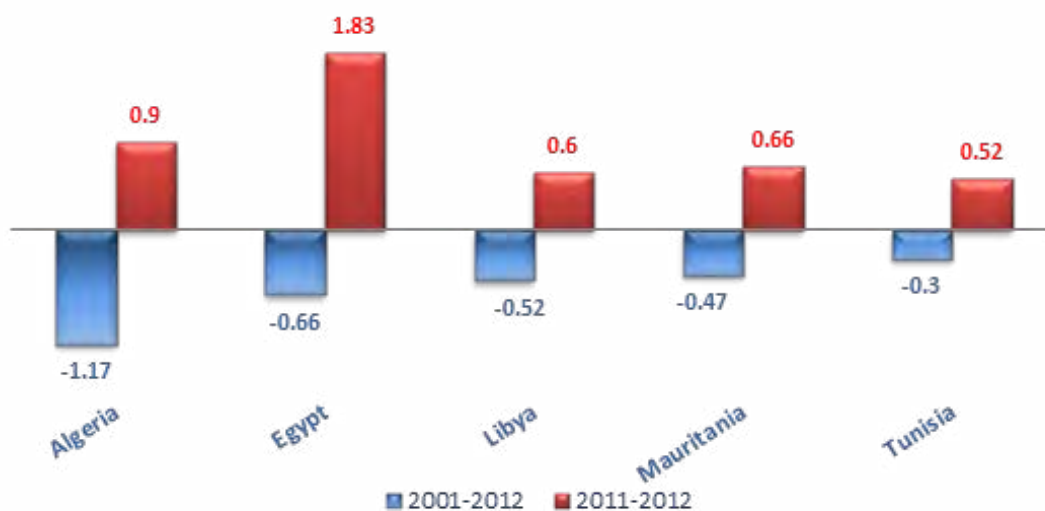


Figure 33c. Impact of Green cover Land Use change on Surface Water Runoff (mm/year)

3.4. Water & Services

The Indicators are as follows:

- i. **Water Supply and Sanitation Coverage:** This sub-category addresses the water supply and sanitation coverage in the MEWINA countries. For each coverage related indicator, the percentage will be expressed according to two sources; the national entity in charge of water, and the 2012 Joint Monitoring Programme (JMP) report issued by the World Health Organization (WHO)

and UNICEF. The main reason for presenting two different values for the same indicator is to highlight the difference in the conceptualization of “improved” Water Supply and Sanitation between International organizations and National entities. The JMP definitions of improved Water Supply and Sanitation are presented below.

- a) **Urban Water Supply Coverage:** Percentage of population provided with piped drinking water in urban areas
 - b) **Rural Water Supply Coverage:** Percentage of population provided with piped drinking water in rural areas
 - c) **Urban Sanitation Coverage:** Percentage of population covered with sanitation in urban areas.
 - d) **Rural Sanitation Coverage:** Percentage of population covered with sanitation in rural areas.
 - e) **Percentage of population with improved water supply:** An improved drinking-water source is defined as one that, by nature of its construction or through active intervention, is protected from outside contamination” . The improved options are ranked from best to worst as follows(WHO and UNICEF):
 - **Piped Into Premises:** Best Option
 - **Other Improved Drinking Water Sources:** Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, rainwater collection.
 - **Unimproved Drinking-Water Sources:** Unprotected dug well, unprotected spring, cart with small tank/drum, surface water, bottled water.
 - **Unimproved: Surface Drinking-Water Sources:** river, dam, lake, pond, stream, canal, irrigation channels.
 - f) **Percentage of population with improved sanitation:** Defined looking at the following facilities as indicators: Flush or pour-flush (piped sewer system, septic tank, pit latrine), Ventilated Improved Pit (VIP) latrine, pit latrine with slab, composting toilet. The improved options are ranked from best to worst as follows(WHO and UNICEF) :
 - Flush/pour flush to: - piped sewer system- septic tank- pit latrine• Ventilated improved pit-(VIP) latrine- Pit latrine with slab
 - Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved
 - Unimproved sanitation facilities: do not ensure hygienic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines and bucket latrines.
 - Open defecation
- ii. **Water Infrastructure:**
- a. **Length of Water Supply Networks**

- b. **Length of Sewage Networks**
- c. **Length of Irrigation Networks**
- d. **Length of Drainage Networks**
- e. **Dam Storage Capacity:** The total capacity of all water regulating structures installed.
- f. **Water Supply Capacity:** Defined as the total Drinking Water Treatment capacity, in other words it is the summation of the potential capacities of all drinking water plants in any given country.
- g. **Desalination Capacity:** The total capacity of all desalination plants
- h. **Municipal Wastewater Treatment Capacity:** Is the summation of the potential capacities of all municipal treated wastewater plants in any given country
- i. **Industrial Wastewater Treatment Capacity:** Is the summation of the potential capacities of all Industrial treated wastewater plants in any given country
- j. **Wastewater Collection Capacity:** The Total volume of wastewater that can be collected through the existing collection systems.
- k. **Maximum Annual Dam Storage Reached:** Is the actual storage reached in a given year, which should always be lower than the Dam Storage Capacity.

Table. 9 shows the indicators values for the “Water & services” Category.

Table 9. Water & Services Indicator Values

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	4	Water & Services							
*	*	Water Coverage and Accessibility							
59	4-1	Improved Urban Water Supply Coverage	%	100	99	86.90	65	100	90.1
60	4-2	Improved Rural Water Supply Coverage	%	80	98	10.70	60	93.40	68.42
61	4-3	Improved Urban Sanitation Coverage	%		90	88.10	60	85.40	
62	4-4	Improved Rural Sanitation Coverage	%		12	10.10	40	83.50	
63	4-5	Improved Water Supply Coverage	%	95	98.50	70	62	97.80	90.18
64	4-6	Improved Sanitation Coverage	%	86	51	70	46	94.44	75.13
*	*	Water Infrastructure							
65	4-7	Length of Water Supply Networks	km	105,000	147,607	20000	50,000	126,559	
66	4-8	Length of Sewage Networks	km	43,000	41,172	8000		15,364	
67	4-9	Length of Irrigation Networks	km	5,381	33,550	4000	15,000		
68	4-10	Length of Drainage Networks	km	2,913	23,867		3,000		
69	4-11	Dam Storage Capacity	BCM		174	0.06	0.9	2.152	
70	4-12	Water Supply Capacity	BCM/Year		12.8	2.87		0.76	

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
71	4-13	Desalination Capacity	BCM/Year		0.16	0.68	50000	0.03	
72	4-14	Municipal Wastewater Treatment Capacity	BCM/Year	0.80	8.7	0.04		0.23	
73	4-15	Industrial Wastewater Treatment Capacity	BCM/Year			0.024		0.0193	
74	4-16	Wastewater Collection Capacity	BCM/Year		6	0.438		0.234	
75	4-17	Maximum Annual Dam Storage Reached	BCM			0.09			

Figure (34) shows the improved Water Supply and Sanitation Coverage in all MEWINA countries according to the WHO-UNICEF Joint Monitoring Programme (JMP), it is clear that all countries but Mauritania are approaching full coverage, which explains why Mauritania is the center of attention of the donors community and different NGOs, Initiatives, and Organizations working in the field of Global Water Supply and Sanitation. The Region averaged Water Supply coverage is 90.28% while the Improved Sanitation coverage is 84%.

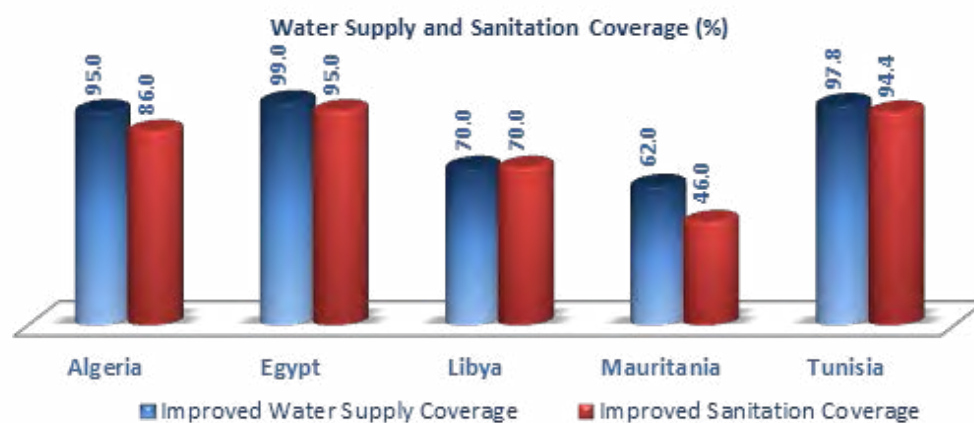


Figure 34. Water Supply and Sanitation Coverage (JMP)

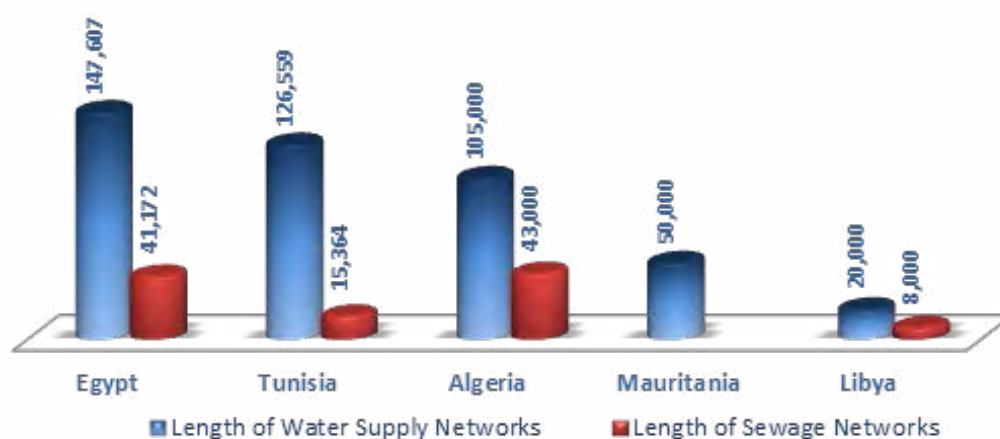


Figure 35. Water Supply and Sewage Network Lengths in the N-AMCOW Region

3.5. Water & Energy

The indicators are as follows:

- Electricity Generated Using Hydropower:** Hydropower production as percent of total electricity production (World Bank). And, the Hydropower generated per year.
- Electricity Generated Using Hydropower as a percent of all generated Electricity**
- Installed Hydrocapacity:** Sum of all generator nameplate power ratings (in GW) from the installed Hydropower Plants (AMCOW, 2012).
- Water used to Generate Electricity:** The total annual volume of inflow through all hydro generators.

Table 10 shows the indicator values

Table 10. "Water & Energy" Indicator values

No	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	5	Water & Energy							
76	5-1	Electricity Generated Using Hydropower	GWh/Year	48,426	12,935	NA	120	111	
77	5-2	Hydropower as % of Total Generated Electricity	%		8	NA		1	
78	5-3	Installed Hydropower Capacity	MW	479	2,848	NA	30	66	
79	5-4	Water Used to Generate Electricity	BCM/Year		181.40	0.0035		0.83	

Figure (36) shows the Electricity generated using Hydropower expressed in GWh/year and the installed hydropower capacity expressed in MW, it is clear that Algeria ranks first in term of hydropower generation while Libya has no hydropower generation.

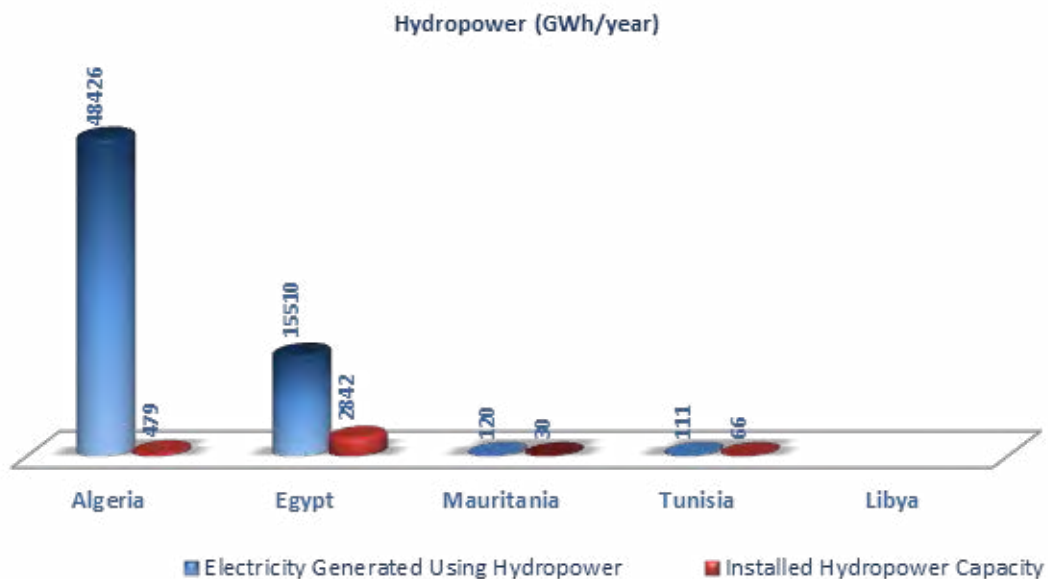


Figure 36. Hydropower Generation and Capacity in MEWINA Countries

3.6. Water & Population

- a. **Internal Renewable water resources per capita:** The maximum theoretical amount of water produced internally and actually available, on a per person basis (modified from FAO).
- b. **Total renewable Blue water resources per capita:** the maximum theoretical amount of water actually available, on a per person basis (FAO).
- c. **Total Population**
- d. **Internal Renewable Water Resources per Capita:** Long-term average annual flow of rivers and recharge of aquifers generated from endogenous precipitation, on a per person basis (Modified from FAO).
- e. **Total Renewable Blue Water Resources per Capita:** Is the resultant of the internal produced surface water and the transboundary inflows and outflows of surface water, on a per person basis.
- f. **Total Renewable Water Resources per Capita:** Is the sum of total renewable blue and green water resources, on a per person basis.
- g. **Blue Water Withdrawal Per Capita:** Total annual abstractions from surface and groundwater sources including non-renewable groundwater and secondary freshwater sources (water previously withdrawn and returned), on a per person basis (modified from FAO).
- h. **Green Water Consumption Per Capita:** The total amount of precipitation directly consumed by pasture areas, rain-fed areas, and forest areas, on a per person basis.
- i. **Total Available Water Resources Per Capita:** The sum of renewable, non-renewable, and non-conventional Water resources on a per person basis.
- j. **Total Water Consumption Per Capita:** the gross amount of water extracted from all sources, either permanently or temporarily, on a per person basis.
- k. **Agricultural Water Withdrawal Per Capita:** The sum of total agricultural abstractions from blue water, and direct beneficial abstractions from precipitation in rain-fed areas, on a per person basis.
- l. **Industrial Water Withdrawal Per Capita:** Total annual volume of water withdrawals used for industrial purposes on a per person basis.
- m. **Domestic Water Withdrawal Per Capita:** Total annual volume of water withdrawals used for domestic purposes on a per person basis.
- n. **Population Without Improved Water Supply:** The total population without improved Water supply.
- o. **Population Without Improved Sanitation:** The total population without improved Sanitation.

Table 11 shows the “Water & Population” Indicators values

Table 11. "Water & Population" indicator values

NO	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	6	Water & Population							
80	6-1	Total Population	1000 inhabitants	37,500	82,550	6,200	3,378	10,776	140,404
81	6-2	Internal Renewable Water Resources Per Capita	CM/capita/Year	360	0	101	118	389	213
82	6-3	Total Renewable Blue Water Resources Per Capita	CM/capita/Year	355.2	672	85	684	373	438
83	6-4	Total Renewable Water Resources Per Capita	CM/capita/Year		680	3,751	6,884	1,585	3,231
84	6-5	Total Available Water Resources Per Capita	CM/capita/Year	915	1133	600	7,830	1,683	2,403
85	6-6	Blue Water Withdrawal Per Capita	CM/capita/Year	257	1027	800	502	254	538
86	6-7	Green Water Use Per Capita	CM/capita/Year	456	8	3,666	6,728	1,206	2,413
87	6-8	Total Water Consumption Per Capita	CM/capita/Year		925	4,426	1,673	1,460	2,127
88	6-9	Agricultural Water Withdrawal Per Capita	CM/capita/Year		739	613	447	201	500
89	6-10	Industrial Water Withdrawal Per Capita	CM/capita/Year	17.3	53	102	8	8	38
90	6-11	Domestic Water Withdrawal Per Capita	CM/capita/Year	80	116	45	28	46	61
91	6-12	Population Without Improved Water Supply	1000 inhabitants	1,875	1,220	1,860	1,680	240	5,164
92	6-13	Population Without Improved Sanitation	1000 inhabitants	5,250	39,961	1,860	2,486	579	48,260

The Water & Population indicators values are shown in Figures (37) through (41). Figure (37) shows that Mauritania and Egypt have the highest per capita share of Blue Water Resources as a reason for their dependency on External Renewable Water Resources, but when Total Renewable Water Resources is considered, Mauritania, by far, has the highest per capita share due to the presences of significant Green Water Resources as well as the low population. Egypt and Libya have the highest per capita rate of Blue Water withdrawals, while Mauritania has the highest Green Water Consumption per capita share. The Total available Water Resources per capita in Mauritania is the highest in all MEWINA countries , although the dependency on non-conventional Water Resources is relatively less established compared to other MEWINA countries.

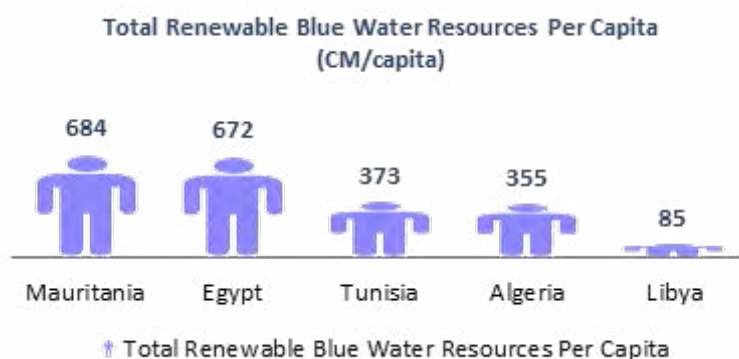


Figure 37. Total Renewable Blue Water Resources per Capita in the N-AMCOW Region

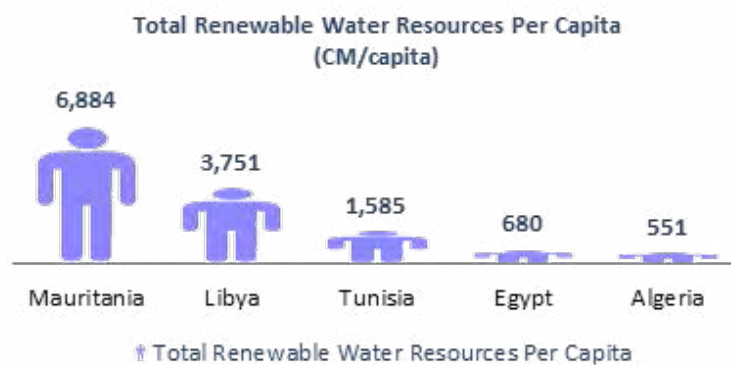


Figure 38. Total Renewable Water Resources per Capita in the N-AMCOW Region

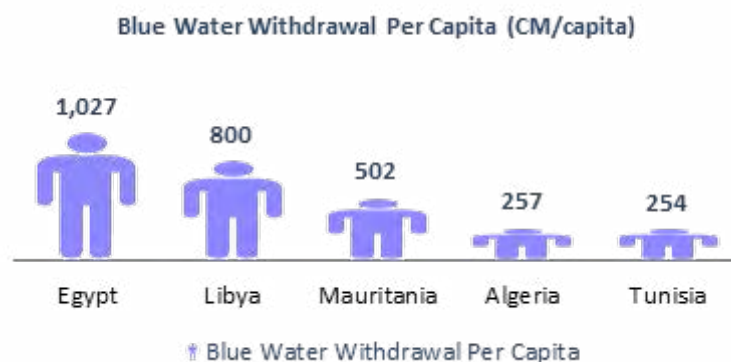


Figure 39. Total Renewable Water Resources per Capita in the N-AMCOW Region

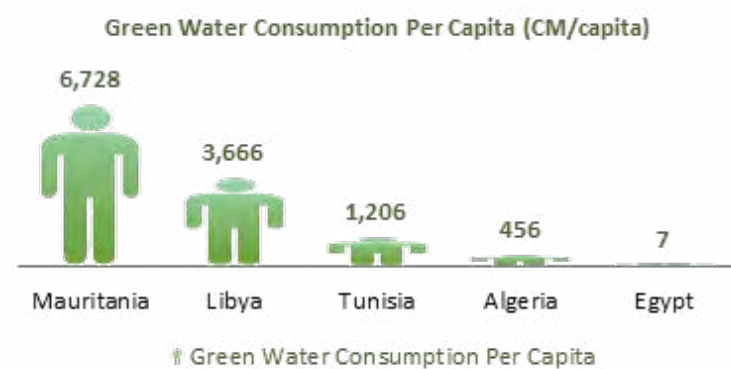


Figure 40. Total Green Water Consumption per Capita in the N-AMCOW Region

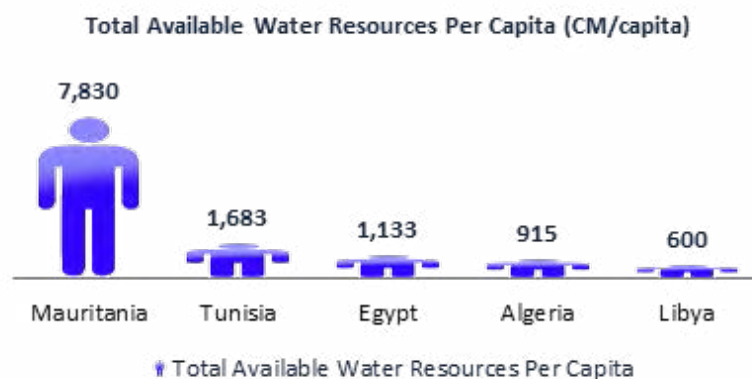


Figure 41. Total Available Water Resources per Capita in the N-AMCOW Region

3.7. Water & Health

The indicators are as follows:

- a. **Diarrhea prevalence (% of children under five):** % of children under five cases suffering from Diarrhea.
- b. **Cholera Reported Cases:** number of annual incidents of the disease.
- c. **Dracunculiasis Reported Cases:** number of annual incidents of the disease.
- d. **Typhoid Reported cases:** number of annual incidents of the disease.
- e. **Hepatitis A Reported cases:** number of annual incidents of the disease.
- f. **Open defecation practice:** Number of people who continue to practice open defecation.
- g. **Percentage of open defecation:** The percentage of population practicing open defecation.

Table 12 shows the “Water & Health” indicator values

Table 12. “Water & Health” Indicator Values

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	7	Water & Health							
93	7-1	Diarrhea Prevalence	%		18.40	16.90	18.30	10.29	
94	7-2	Dracunculiasis Reported Cases	%	0	0	0	0	0	0
95	7-3	Open Defecation Practice	number		0	0		348,540	
96	7-4	Percentage of Open Defecation	%		0	0	44	3.2	
97	7-5	Cholera Reported Cases	Number/Year	0	0	0	2,047	0	
98	7-6	Typhoid Reported Cases	Number/Year	64	216	314		28	
99	7-7	Hepatitis A Reported Cases	Number/Year	926	308	176		412	

Figure (42) shows one of the most important “Water & Health” indicators dealing with the prevalence of

Diarrhea among children less than 5 years old and it shows that Tunisia has the lowest percentage of that indicator, and that there is no reported value for Algeria. The remaining three countries have close values.

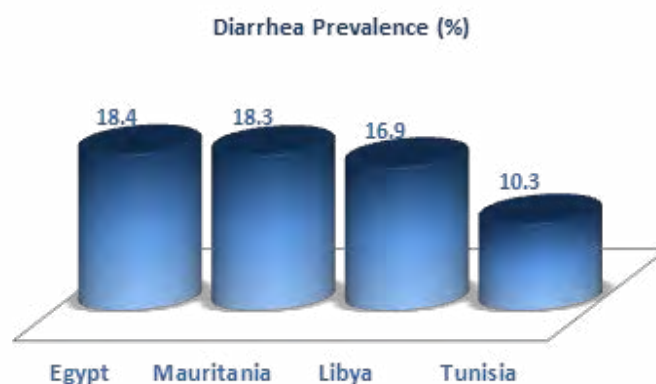


Figure 42. Diarrhea Prevalence children under 5 in the N-AMCOW Region

3.8. Water & Quality

The following indicators should be measured or reported for in all surface and groundwater quality monitoring stations in each country to identify the average, minimum, and maximum values for each indicator, the values of all of these indicators are directly connected to anthropogenic activities:

- a) **Dissolved oxygen (ppm):** is a measure of free (i.e., not chemically combined) oxygen dissolved in water. It is essential to the metabolism of all aerobic aquatic organisms. Reduced levels could harm and even kill plants and fish.
- b) **pH (dimensionless):** is a measure of the acidity or alkalinity of a water body. It can affect aquatic organisms both directly, by impairing respiration, growth, and development of fish, and indirectly, by increasing the bioavailability of certain metals such as aluminum and nickel.
- c) **Electric Conductivity:** measured in 1/OHM (S/M) is a measure of the ability of water to carry an electric current, which depends on the presence of ions. Increases in conductivity can lead to changes that reduce biodiversity and alter community composition.
- d) **Total Dissolved Solids (ppm):** is a measure of the combined content of all organic and inorganic substances contained in a water sample.
- e) **Nitrogen Concentration (ppm):** Nitrogen and phosphorus are naturally occurring elements essential for all living organisms. But they are often found in growth-limiting concentrations in aquatic environments. Increases in nitrogen or phosphorus in natural waters, largely as a result of human activities in the drainage basin (e.g., from agricultural runoff from manure and synthetic fertilizers, and from municipal and industrial waste-water discharge), can overstimulate plant growth and choke off oxygen supplies.
- f) **Phosphorous Concentration (ppm):** See above.

- g) **Fecal Choliform (Colonies/100 ML):** Increased levels of fecal coliforms means there is a failure in water treatment, a break in the integrity of the distribution system, or possible contamination with pathogens. Tests for this kind of bacteria are done through the cheap and rapid 1-day incubation methodology.
- h) **Biological Oxygen Demand (BOD) (mg/l):** the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period
- i) **Chemical Oxygen Demand (COD)(mg/l):** chemical oxygen demand (COD) test is commonly used to indirectly measure the amount of organic compounds in water. Most applications of COD determine the amount of organic pollutants found in surface water
- j) **Chloride Concentration:** the concentration of chloride in a given water sample.
- k) **Total Hardness:** The concentration of Calcium Carbonate (CaCO₃) in a given water sample.

Table 13 shows the “Water & Quality” indicator Values

Table 13. Water & Quality Indicator Values

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	8	Water & Quality							
100	8-1	Dissolved Oxygen (DO)	PPM		ML	7.3	6.50	ML	
101	8-2	pH	Dimensionless		ML	7.65	7.80	ML	
102	8-3	Electric Conductivity (EC)	1/OHM (S/M)		ML	1630	1,000	ML	
103	8-4	Nitrogen Concentration	PPM		ML	50	0.50	ML	
104	8-5	Phosphorous Concentration	PPM		ML			ML	
105	8-6	Total Dissolved Solids	PPM		ML	1060		ML	
106	8-7	Fecal Choliform	Colonies/100ML		ML	0		ML	
107	8-8	Biological Oxygen Demand (BOD)	mg/l		ML				
108	8-9	Chemical Oxygen Demand (COD)	mg/l						
109	8-10	Chloride Concentration	mg/l			243			
110	8-11	Total Hardness (CaCo ₃)	mg/l			379			

ML: Values recorded in Multiple Locations

NA: Not Applicable

The Water & Quality indicators were among the most difficult indicators to assess within the initial phase of the MEWINA due to the difficulty in the estimation of average values. While the Libyan Unit was able to estimate the average values shown in table 12, Egypt and Tunisia reported the values of the indicators in multiple locations. Table 14a shows the values of Tunisia, while Table 14b shows the percentages of samples that did not exceed the National standard limit for the different indicators in Egypt in different Nile River Reaches as well as Lake Nasser. The number of overall tested samples increased from 773 in 2007 to 948 in 2011.

Table 14a. Water & Quality indicator values in Tunisia

Dissolved Oxygen (DO)	Fpm	-	-	-	V1 : 7.7-8.5 V2 : 5.4-6.4 V3 : NA V4 : NA	ANPE COPEAU AQUAPOLE	V1 : Medjerda V2 : Beja dams V3 : Bizerte lagoon V4 : Nabeul Groundwater
pH	Dimensionless	-	-	-	V1 : 7.8-11.2 V2 : 8.0-8.4 V3 : 7.7-8.8 V4 : 8.4-8.7	ANPE COPEAU AQUAPOLE	V1 : Medjerda V2 : Beja dams V3 : Bizerte lagoon V4 : Nabeul Groundwater
Electric Conductivity (EC)	(m S/cm)	-	-	-	V1 : 1.5-2.5 V2 : 0.2-0.5 V3 : 1.7-46.8 V4 : 2.0-7.0	ANPE COPEAU AQUAPOLE	V1 : Medjerda V2 : Beja dams V3 : Bizerte lagoon V4 : Nabeul Groundwater
Nitrogen Concentration (NO ₃)	ppm	-	-	-	V1 : NA V2 : NA V3 : 2.0-128.2 V4 : NA	ANPE COPEAU AQUAPOLE	V1 : Medjerda V2 : Beja dams V3 : Bizerte lagoon V4 : Nabeul Groundwater
Phosphorous Concentration (PO ₄)	ppm	-	-	-	V1 : 1.3-33.0 V2 : 0.4-9.7 V3 : 0.1-71.8 V4 : 0.1-0.7	ANPE COPEAU AQUAPOLE	V1 : Medjerda V2 : Beja dams V3 : Bizerte lagoon V4 : Nabeul Groundwater
Total Dissolved Solids	ppm	-	-	-	V1 : 730-1480 V2 : 110-220 V3 : 950-37800 V4 : 1200-5500	ANPE COPEAU AQUAPOLE	V1 : Medjerda V2 : Beja dams V3 : Bizerte lagoon V4 : Nabeul Groundwater
Fecal Coliform	Colonies/100 ml	-	-	-	Unsuitable cases - 1.5% NA (DHMPF)	SONEDE NA (DHMPF)	1.5% < NT 09-14 limit and < threshold WHO

Table 14b. "Water & Quality" Values for Egypt

Indicator	Location (Units)	2012 Value
Dissolved Oxygen (DO)	Lake Nasser (%)	100
	Nile River (%)	100
	Rosetta branch (%)	57
	Damietta Branch (%)	100
pH	Lake Nasser (%)	100
	Nile River (%)	100
	Rosetta branch (%)	92.8
	Damietta Branch (%)	100
Nitrogen & Phosphorous Concentrations	Lake Nasser (%)	100
	Nile River (%)	100
	Rosetta branch (%)	76
	Damietta Branch (%)	100

Indicator	Location (Units)	2012 Value
Phosphorous & Nitrogen Concentrations	Lake Nasser (%)	100
	Nile River (%)	100
	Rosetta branch (%)	76
	Damietta Branch (%)	100
Total Dissolved Solids	Lake Nasser (%)	100
	Nile River (%)	100
	Rosetta branch (%)	100
	Damietta Branch (%)	100
Biological Oxygen Demand (BOD)	Lake Nasser (mg/l)	5.22
	Nile River (mg/l)	3.38
	Rosetta branch (mg/l)	2.72
	Damietta Branch (mg/l)	2.89

3.9. Water & Ecosystems

The indicators are as follows:

- Number of Wetlands Sites:** Including those acknowledged by RAMSAR, Sabkhas, Groundwater-based wetlands, and water bodies of special importance.
- Total Wetlands areas** (to be calculated by earth observation tools).
- Number of Endangered Species:** The total number of endangered species that dwells partially or permanently in the water bodies inbounded within the country.
- Number of Invasive Species:** The total number of invasive species that dwells partially or permanently in the water bodies inbounded within the country.
- Total Freshwater Species Count:** The total number of species that dwells partially or permanently in the water bodies inbounded within the country.

Table 15 shows the indicator values under this category.

Table 15. Water & Ecosystems Values

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	9	Water & Ecosystems							
111	9-1	Number of Wetlands Sites Acknowledged by RAMSAR	Number		4	2		35	
112	9-2	Total Wetlands Areas	ha	2,991,013	429,332	8,300	1,746,000	877,468	
113	9-3	Total Freshwater Species Count	Number			43		450	
114	9-4	Number of Endangered Species	Number				16	10	
115	9-5	Number of Invasive Species	Number					500,000	

Figure (43) shows the number of RAMSAR Wetlands sites and their areas in the N-AMCOW Region

with Algeria having the largest wetland areas distributed over 50 RAMSAR sites.

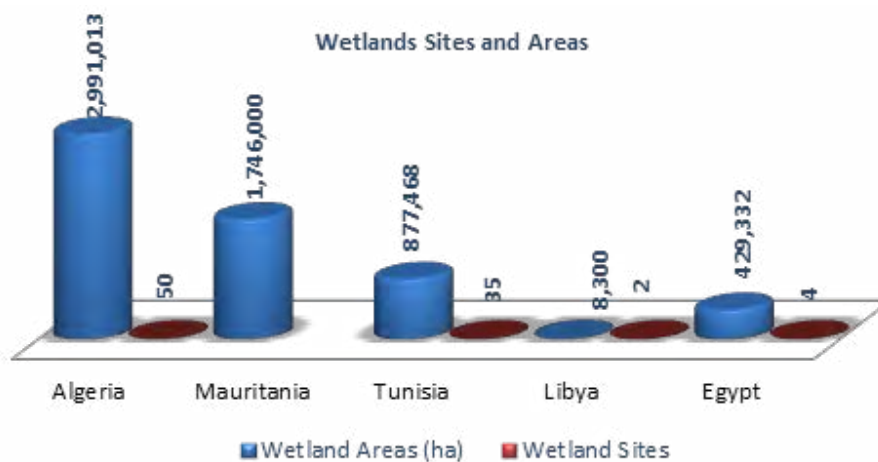


Figure 43. Wetlands in the N-AMCOW Region

3.10. Water & Climate

i. Extreme Weather Events

- a) **Number of Class 1 flood events:** Class 1 floods are large flood events causing significant damage to structures or agriculture; fatalities; and/or 1-2 decades-long reported interval since the last similar event (Dartmouth, 2013)
- b) **Number of Class 1.5 flood events:** Class 1.5 floods are very large events: with a greater than 2 decades but less than 100 year estimated recurrence interval, and/or a local recurrence interval of at 1-2 decades and affecting a large geographic region (> 5000 sq. km) (Dartmouth, 2013)
- c) **Number of class 2 flood events:** Class 2 flood events are extreme events with an estimated recurrence interval greater than 100 years (Dartmouth, 2013)
- d) **Drought events:** a drought event is a long period of abnormally low rainfall, especially one that adversely affects growing or living conditions. The abnormally low rainfall will be taken as 25% of the record monthly average. In other words, a period where rainfall has been consistently lower than 25% of the record average will be considered a drought event.
- e) **Cost of Annual damage induced by floods:** estimate to be reported by the national authority
- f) **Cost of Annual damage induced by droughts:** estimate to be reported by the national authority
- g) **Annual human losses related to Floods.**
- h) **Annual human losses related to Droughts.**
- i) **Average Temperature:** The Annual Average recorded temperature.
- j) **Unusual Weather Events (Snow, Hail):** The number of occurrences of weather events that are historically unusual to a given country.



Tunisia Floods 2007

Algeria Floods 2008

Sinai, Egypt Floods 2010/1/9

k) Existence of Early Warning Disaster prevention System and Year of establishment

l) Existence of National Climate Change Adaptation Plan. (Yes/No): A cross sectoral plan that addresses Climate Change mitigation measures as well as water adaptation measures.

Table 16 shows the different indicator values

Table 16. "Water & Climate" Indicator Values

No	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	10	Water & Climate							
*	*	Extreme Weather Events							
116	10-1	Number of Class 1 Flood Events	Number			7		0	
117	10-2	Number of Class 1.5 Flood Events	Number			6		1	
118	10-3	Number of Class 2 Flood Events	Number			0		0	
119	10-4	Average Temperature	C°		Low 7.6 - 27.7 High 19.9-38.0	21.1			
120	10-5	Drought Events	Number					0	
121	10-6	Cost of Annual Damage Caused by Floods	\$ - % of GDP					0.007	
122	10-7	Cost of Annual Damage Caused by Droughts	\$ - % of GDP						
123	10-8	Annual Human Losses Related to Floods	Number					20	
124	10-9	Annual Human Losses Related to Droughts	Number					0	
125	10-10	Unusual Weather Events (Snow, Hail,.....)	Number/Type			7		29	
126	10-11	National Climate Change Adaptation Plan	Yes/No	Yes	Yes	NO		yes	

Floods, Droughts, and Unusual Weather Events are indicators of National and Regional concern, their trends should be well studied to formulate proper disaster management plans. Many floods occurred recently in different spots in the N-AMCOW Region, such as Sinai, Egypt in 2010 (Figure (44)) also , unprecedented snow occurred recently in Egypt (Figure (45)).

Libya has reported 7 class 1 floods and 6 class 1.5 floods in 2012, while Tunisia reported 1 class 1.5 floods in the same year. Moreover, Tunisia has reported 29 unusual weather events.

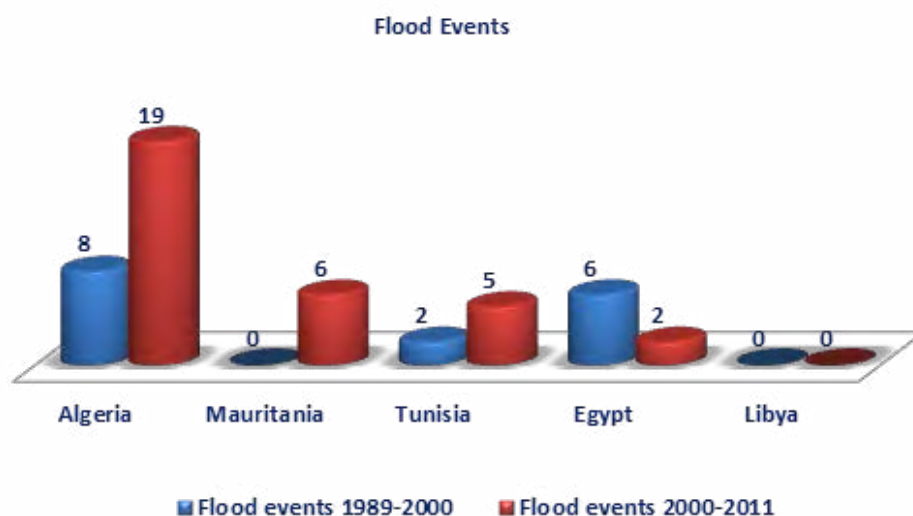


Figure 44a. Floods events from 1989-2011



Figure 44b. Floods in Sinai, Egypt in 2010



Figure 45. Unusual Snow in Egypt

3.11. Water & Socio-Economics

i. Water Productivity

- a) **Industrial Water Productivity:** Economic value added (in US\$) per cubic meter of water withdrawn by the Industrial sector. In other words, it is the gross agricultural revenue (GDP) divided by the total industrial water consumption.
- b) **Agricultural Water Productivity (Crop per Drop):** Economic value added (in US\$) per cubic meter of water withdrawn by agriculture: In other words, it is the gross agricultural revenue (GDP) divided by the total agricultural water consumption (including irrigation withdrawals and rain fed agriculture green water consumption)..

- c) **Employment in Agriculture “Job per Drop”:** The ratio of total labor employed in Agriculture to the total agricultural withdrawals (including irrigation withdrawals and rain fed agriculture green water consumption)
- d) **Employment in Industry “Industry Job per Drop”:** The ratio of total labor employed in Industry to the total industrial withdrawals.
- e) **Gross Domestic Product (GDP):** The monetary value of all the finished goods and services produced within a country’s borders in a specific time period

ii. Tariffs and Affordability

a) Absolute monthly tariff of Water and Sanitation in US\$

b) **Water and Sanitation Charges as % of Average Household Income:** The monthly charge for 10 cubic metres of Water compared to the monthly household income. The household Income is estimated as five times the Gross National Income (GNI) per Capita.

- **GNI per Capita:** GNI per capita (formerly GNP per capita) is the gross national income, converted to U.S. dollars using the World Bank Atlas method, divided by the midyear population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad.

Table. 17 shows the indicators values under this category.

Table. 17. “Water & Socio-Economics” Indicator Values

No	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	11	Water & Socio-Economics							
*	*	Water Productivity							
127	11-1	Industrial Water Productivity	\$/CM	173.59	21.06	369.48	74.44	145.33	156.78
128	11-2	Agricultural Water Productivity “Crop Per Drop”	\$/CM	3.28	0.49	0.32	1.06	0.51	1.132
129	11-3	Employment in Agriculture “Job Per Drop”	Jobs/MCM	102	113.25	14.62	286	72	587.87
129	11-4	Employment in Industry “Job Per Drop”	Jobs/MCM			3	112	11,994	
130	11-4	GDP	Billion \$		194	73.8			
*	*	Tariffs and Affordability							
131	11-5	Water and Sanitation Charges as % of Average Household Income	%	0.27 (CEDARE / AWC)	4	1.5		0.70	

Two of the most important “Water & Socio-Economics” indicators are shown in Figure (46) which reflects the high industrial water productivity in all MEWINA countries compared to the Agricultural Water Productivity. Figure (47) reflects another important social economical aspect of withdrawing water for Agriculture which is job creating. It is shown that Mauritania has the highest Agriculture dependent labor.

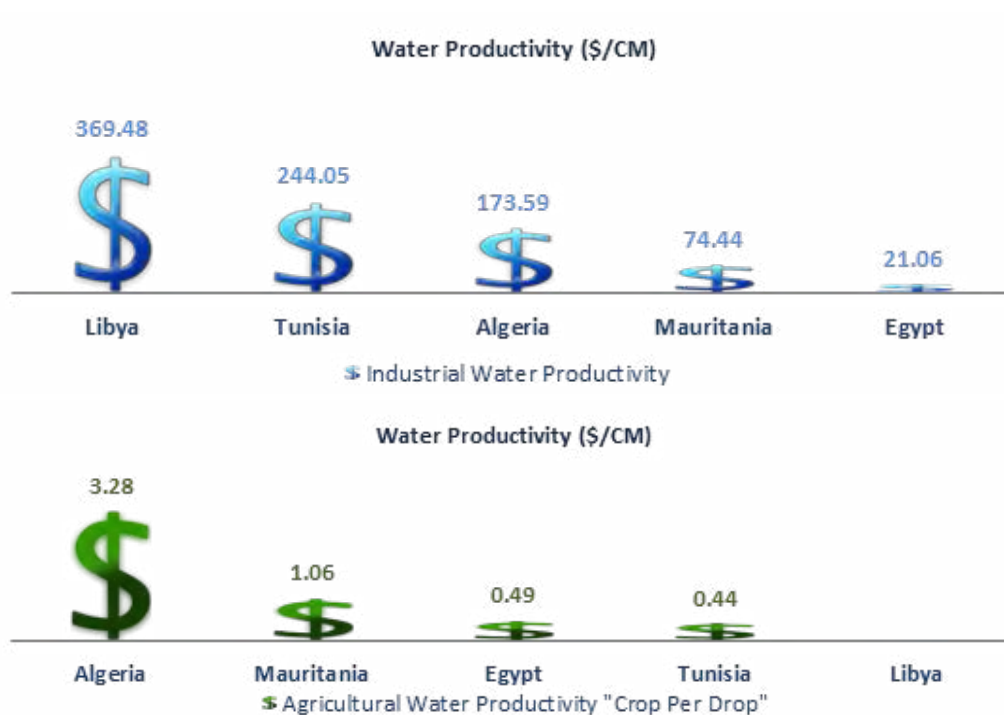


Figure 46. Water Productivity in Industry and Agriculture

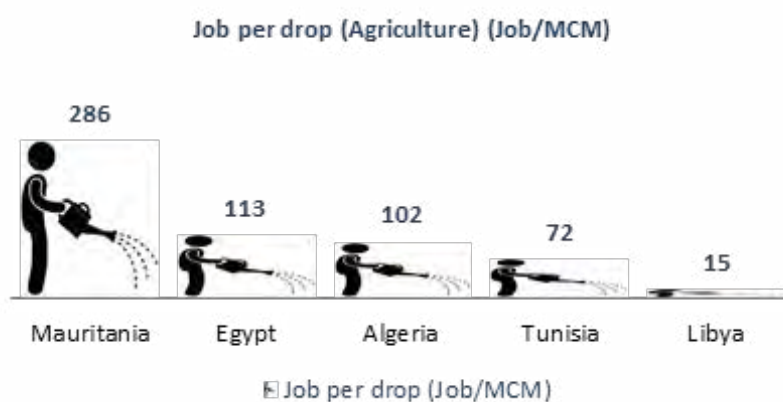


Figure 47. Job per Agricultural drop in the N-AMCOW Region

3.12. Water & Finance

- a) **Total Investment in Water & Sanitation:** it is defined as government spending in water resources infrastructure development, planning & management, as well as drinking water supply and sanitation treatment and reuse.
- b) **Foreign Aid for Water & Sanitation:** The sectoral distribution of bilateral Official Development Assistance commitments refers to the economic sector of destination (i.e. the specific area of the recipients economic or social structure whose development is, or is intended to be fostered by the aid), rather than to the type of goods or services provided. These are aggregates of individual projects

notified under the Creditor Reporting System, supplemented by reporting on the sectoral distribution of technical co-operation, and on actual disbursements of food and emergency aid.

- c) **Aid for the Water sector in Foreign Countries:** The Total Financial Aid disbursed for the purpose of enforcing and enhancing the water sector in other countries.
- d) **Percentage of National Budget directed to the Water Sector:** It is the percentage of national budget directed to all water related projects, labor, and services. It includes all water use sector, and is not limited to Water supply and sanitation.
- e) **Budget Directed to Sanitation & Hygiene as a percent of GDP:** It is the percentage of national budget directed to all water related projects, labor, and services compared to the country's GDP
- f) **Operation & Maintenance Cost Recovery for Water Supply and sanitation:** Is the sum of all tariffs collected from all subscribers to Water supply and Sanitation services in one year divided by the total operation and Maintenance cost of water supply and sanitation for the same year:
- g) **Operation & Maintenance Cost Recovery for Irrigation:** Is the sum of all tariffs collected from all farmers in one year divided by the total operation and Maintenance cost of irrigation for the same year. The total sum of incoming tariff payments could be obtained from the archives of the governmental entity in charge of Irrigation.
- h) **Operation & Maintenance Cost Recovery for Industry:** Is the sum of all tariffs collected from all industrial establishments in one year divided by the total operational cost of irrigation for the same year. The total sum of incoming tariff payments could be obtained from the archives of the governmental entity in charge of Industrial Water Supply.

Table 18 shows available values for indicators.

Table 18. "Water & Finance" Indicator Values

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	12	Water & Finance							
132	12-1	Percentage of National Budget Directed to Water & Sanitation Sector	%	1.43	1.1	0.74	1.10	1.90	
133	12-2	Percent of GDP Directed to Sanitation & Hygiene	%		0.22			0.13	
134	12-3	Foreign Aid for Water & Sanitation	Million US\$	30.54 (CEDARE / AWC)		0.02	31	53	
135	12-4	Operation & Maintenance Cost Recovery for Irrigation	%		0			64	
136	12-5	Operation & Maintenance Cost Recovery for Water Supply and Sanitation	%		76			80.70	
137	12-6	Operation & Maintenance Cost Recovery for Industry	%					64	
138	12-7	Aid to Water & Sanitation in Foreign Countries	Million US\$				0		
139	12-8	Total Investment	Million US\$	29,230	1,880	144	200	276	

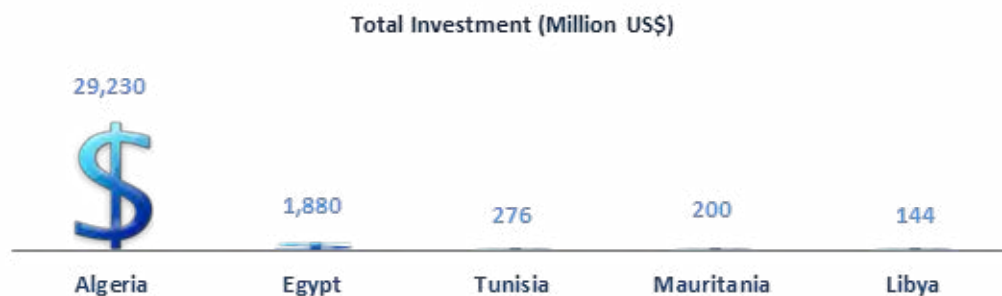


Figure 48a. Total Investment in the Water Sector in MEWINA countries

Figure (48a) shows an important indicator that lies under the “Water & Finance” category which is the total investment in the Water Sector. Algeria ranks first with respect to the total investment which is a huge annual investment of about 30 Billion US Dollars, while Figure (48b) shows the percentage of National Budget directed to the Water & Sanitation sector in the N-AMCOW region, where it is obvious that all percentages are close for all countries ranging from 0.74 % to 1.9%.

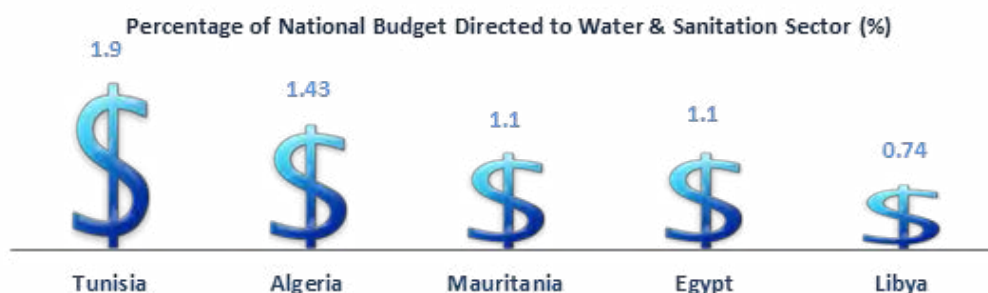


Figure 48b. Percentage of National Budget Directed to Water & Sanitation Sector

3.13. Water & Trade

Virtual-water flows related to trade in crop, animal per country:

- a) **Total Agricultural Virtual Water Import:** Total inflow of virtual water which in turn is defined as the volume of freshwater used to produce the product, measured at the place where the product was actually produced (Hoekstra and Chapagain, 2001).
- b) **Total Agricultural Virtual Water Export:** Total outflow of virtual water which in turn is defined as: the volume of freshwater used to produce the product, measured at the place where the product was actually produced (Hoekstra and Chapagain, 2001).

Hoekstra and Chapagain (2001) provided reference tables that provide the approximate volume of water

needed to produce one kilogram of different crop, animal, and industrial products. Therefore, the volume of water used to produce a certain product can be estimated by multiplying these reference values (or any similar values provided in the national and global literature) by the total annual produced amount of the same product. In the same manner, it is possible to estimate the amount of water embedded in imported and exported products.

Table 19 shows the amount of virtual Water embedded in the unit weight of each of the vital Agricultural products.

Table 20 shows the amounts of exported agricultural products in the N-AMCOW Region in 2009, while table 21 shows the amounts of imported agricultural products in the same year (AOAD, 2009).

Table 19. Virtual Water embedded in Agricultural Products

ITEM	Cubic meters/ ton
WHEAT AND FLOUR	1334
MAIZE	909
RICE	2291
BARLEY	1910
POTATOES	255
PULSES (TOTAL)	1754
VEGETABLES (TOTAL)	195
FRUITS (TOTAL)	455
SUGAR(REFINED)	1929
FATS & OILS(TOTAL)	18000
RED MEAT	15497
POULTRY MEAT	2046
EGGS	2700
MILK & DAIRY PROD.	5000

Hoekstra & Chapagain, 2001 & Egypt NWRC (2009)

Table 20. Exported Agricultural Products in the N-AMCOW Region

FOOD Exported (1000 MT)	Algeria	Egypt	Libya	Mauritania	Tunisia
WHEAT AND FLOUR	6	238.14	-	-	1.65
MAIZE	-	15.61	-	-	0
RICE	-	546	-	-	-
BARLEY	-	15.48	-	-	-
POTATOES	0	299.96	0.01	-	10.08
PULSES (TOTAL)	0.09	236	0.11	-	0.73
VEGETABLES (TOTAL)	5.25	791.22	0.18	-	66.62
FRUITS (TOTAL)	9.02	1220.32	0.05	-	143.8
SUGAR(REFINED)	12.73	432.19	-	-	3.55
FATS & OILS(TOTAL)	7.2	118.03	2.02	-	245.16
RED MEAT	0.02	1.47	-	-	0.12
POULTRY MEAT		9.16	-	-	2.9

EGGS	-	0.04	-	-	0.1
MILK & DAIRY PROD.	16.81	2792.64	-	-	53.86

Table 21. Imported Agricultural Products in the N-AMCOW Region

FOOD IMPORTED (1000 MT)	Algeria	Egypt	Libya	Mauritania	Tunisia
WHEAT AND FLOUR	5729.83	9651.54	1450.13	310.92	1914.89
MAIZE	1994.79	4960.35	530.01	3.69	889.28
RICE	75.85	13.86	104.05	15.98	10.24
BARLEY	105.34	14.54	177.13	0.97	429.33
POTATOES	124.92	72.9	10.79	16.21	21.36
PULSES (TOTAL)	175.11	355.52	6.15	2.27	30.19
VEGETABLES (TOTAL)	30.82	3.54	31.76	50.36	20.79
FRUITS (TOTAL)	354.76	576.24	57.43	4.72	37.95
SUGAR(REFINED)	1133.31	800.65	191.31	190.21	349.81
FATS & OILS(TOTAL)	703.35	642.72	142.83	66.6	406.9
RED MEAT	62.30	178.61	20.46	0.01	5.48
POULTRY MEAT		47.62	0.02	5.24	3.21
EGGS	0.50	0.15	11.98	0.49	0.04
MILK & DAIRY PROD.	2752.26	2014.86	354.71	117.27	127.63

Table 22 shows the values for virtual water Exports and Imports for N-AMCOW countries, that have been calculated by multiplying the values in tables 20 and 21 by their corresponding volumes of virtual water by unit weight shown in Table. 19.

Table 22. "Water & Trade" Indicators

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	13	Water & Trade							
140	13-1	Agricultural Virtual Water Export	BCM/Year	0.25	19.78	0.90	0.03	6.03	26.99
141	13-2	Agricultural Virtual Water Import	BCM/Year	39.91	44.40	2.75	2.64	10.22	99.92

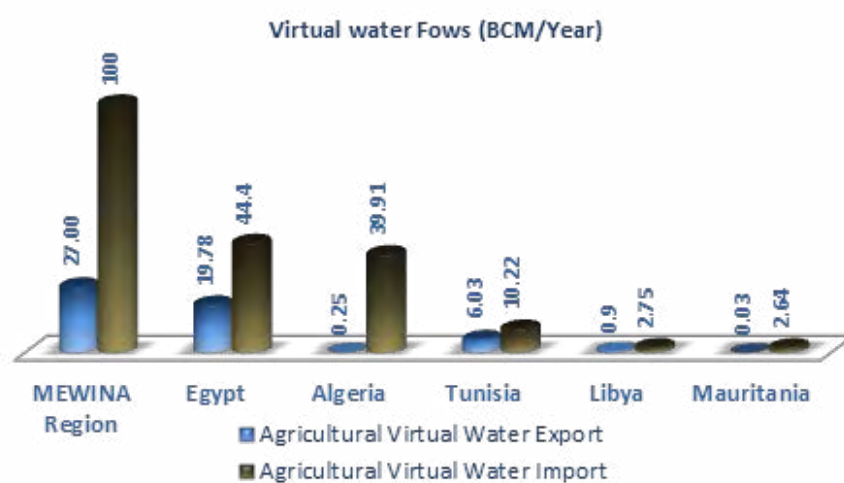


Figure 49. Virtual Water Flows in the N-AMCOW Region

Figure (49) shows the import and export of virtual water in all MEWINA countries. The import of Virtual Water is significantly higher than the export in all MEWINA countries with Egypt being the highest importer and Exporter. It is also shown that the whole Region exports 27 BCM of virtual water.

3.14. Water & Governance

- a) **IWRM plan in place (yes/no):** A national plan dedicated entirely to water resources, with more than 3 entities involved, and with all water use sectors addressed could qualify as a national IWRM.
- b) **Existence of National Water M&E,& R System (AMCOW):** A national Water Monitoring, Evaluation, and Reporting system is defined as a system of indicators that covers all areas related to water and is adequately and continuously assessed and reported according to clear pre-set definitions. The reporting could be in the form of reports or an online web-based system.
- c) **Surface Water Permits Issued to Date:** Number of officially authorized water permits for beneficial usage by individuals or entities to date.
- d) **Total Volumetric Water Rights Associated with Surface Water Permits:** The total annual authorized volumes associated with all authorized water Surface water permits.
- e) **Total Volumetric Water Rights Associated with Surface Water Permits as a Percent of Annual Blue Surface Water Withdrawals**
- f) **Groundwater Well Permits issued to date:** number of officially authorized permits for registered shallow or deep wells for beneficial usage by individuals or entities, Issued to date.
- g) **Total Volumetric Water Rights Associated with Well Permits:** The total annual authorized volumes associated with all authorized well permits.
- h) **Total Volumetric Water Rights Associated with Well Permits as a Percent of Annual Blue Groundwater Abstractions Number of Unlicensed Wells:** Could be obtained from annual well survey.
- i) **Irrigation & Drainage Related Complaints as a Percentage of Irrigation Water Users:** annual number of complaints that relate directly to irrigation and drainage issues as a percent of total surface water permits.
- j) **Water Supply and Sanitation Related Complaints as a Percentage of Serviced Households:** annual number of complaints that relate directly to water supply and sanitation services as a percent of all serviced households.
- k) **Number of Water Supply meters installed as a percent of total number of covered households:** the ratio of the total number of installed water supply meters to the total number of households covered with water supply. The total number of households can be estimated by dividing the total covered population by 5.
- l) **Number of Groundwater Meters Installed as a Percent of Licensed Wells**
- m) **Number of Irrigation meters Installed as a percent of surface water permits**

- n) **Physical Domestic water losses:** The amount of domestic water lost due to leakage in the piped conveyance system. It is best determined by detailed flow measurements, but it can also be estimated by empirical equations that include but are not limited to the Unavoidable Annual Real Losses (UARL) equation developed by the University of Arizona (Delgado, 2008) as follows: $UARL = (5.41L_m + 0.15xN_c + 7.5xL_p) xP$
- o) **Where:** L_m = Length of mains in feet, N_c = Number of service connections, L_p = Length of private pipe in feet, P = Average pressure in PSI
- p) **Commercial water losses:** Is the Unaccounted for water due to theft or lack of metering and is calculated by subtracting the sum of the total accounted for water (metered volumes) and the physical losses from the total withdrawals by the domestic sector.
- q) **Physical Irrigation Water losses:** The amount of Irrigation water lost in the different elements of the irrigation conveyance system (canals and drains) through seepage and evaporation.
- r) **Overall Water Use Efficiency:** The ratio of the difference between the total withdrawals from original sources (surface water, renewable and non-renewable groundwater, and Desalinated Water) and the wastewater and Drainage flows to the Withdrawals from Original Sources expressed as a percentage.
- Overall water Use Efficiency = $100 * ((\text{Withdrawals from Original Sources} - \text{Wastewater and Drainage outflows}) / \text{Withdrawals from Original Sources})$
- s) **Water Sustainability / Depletion Index:** The ratio of the Total Withdrawals from Original Sources including green water consumptions by rainfed agriculture to The Total Renewable Water Resources (Blue and Green Water).
- t) **Wastewater and Drainage Outflows:** Wastewater and Agricultural Drainage flowing out of the system to local and national sinks.
- u) **Transboundary Wastewater and Drainage outflows:** Wastewater and Agricultural Drainage flowing out of the country's borders.
- v) **Number of Water Related Citations (Water Laws Enforcement):** Total annual number of water related citations.
- w) **Number of Water Users Associations:** Number of associations aiming to address the needs and complaints of Agricultural and Industrial water users as well as organize water withdrawals
- x) **Water Users Associations Agricultural land Coverage:** The ratio of the agricultural areas covered by Water Users Associations to the total Agricultural area in the country.

Table 23 shows the “Water & Governance” Indicator values.

Table 23. “Water & Governance” Indicators Values

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	14	Water & Governance							
142	14-1	IWRM Plan	Yes/No	yes	yes			Yes	
143	14-2	National Water and Sanitation M&E & R System	Yes/No		yes		yes	No	

No.	Code	Water Related Indicators	Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
144	14-3	Surface Water Permits Issued to Date	Number		1034 (Treatment plants and Factories)			170	
145	14-4	Total Volumetric Water Rights Associated with Surface Water Permits	BCM/Year					0.005	
146	14-5	Total Volumetric Water Rights Associated with Surface Water Permits as a Percent of Annual Blue Surface Water Withdrawals	%					0.9	
147	14-6	Groundwater Well Permits Issued to Date	Number		34066	35340		1,232	
148	14-7	Total Volumetric Water Rights Associated with Well Permits	BCM/Year		5.2			0.0517	
149	14-8	Total Volumetric Water Rights Associated with Well Permits as a Percent of Annual Blue Groundwater Abstractions	%		60			2.28	
150	14-9	Number of Unlicensed Wells			43590			1,636	
151	14-10	Irrigation & Drainage Related Complaints	Number		2673				
152	14-11	Water Supply and Sanitation Related Complaints as a Percentage of Serviced Households	%					2.83	
153	14-12	Number of Water Supply Meters Installed as a Percent of Total Number of Covered Households	%		93	30		83	
154	14-13	Number of Groundwater Meters Installed	Number		34066				
155	14-14	Number of Surface Irrigation Meters Installed	number		6924				
156	14-15	Physical Domestic Water Losses	BCM/Year		2.3	0.2	0.22	0.126	
157	14-16	Overall Water Use Efficiency	%	70.34	80.90	71.77	72.19	89.50	76.94
158	14-17	Water Sustainability/ Depletion Index	%	50	120	82.42	26.22	48	65.33
159	14-18	Wastewater and Drainage Outflows	BCM/Year	1.50	18.5	1.40	0.45	0.29	15.84
160	14-19	Transboundary Wastewater and Drainage Outflows	BCM/Year		14.3	0		0	
161	14-20	Commercial Water Losses	BCM/Year				0.10	0.03	
162	14-21	Physical Irrigation Water Losses	BCM/Year			1.3		0.82	
163	14-22	Number of Water related citations (Water Laws Enforcement)	Number		25322			188	
164	14-23	Number of Water Users Associations	Number		8000	0		2,580	
165	14-24	Water Users Associations Agricultural Land Coverage	% of Ag. Land		0.06	0		47.50	

While most of the indicators that lie under the “Water & Governance” Category were not assessed in all countries, the overall Water Use Efficiency (Figure (50)) and the Water Sustainability/ Depletion index (Figure (51)) were assessed in all countries. It is clear that N-AMCOW countries have close efficiencies in using water, the average efficiency for the whole Region came out to be 76.94 %, the significant progress in wastewater Treatment in Both Egypt and Tunisia has contributed to the efficiency increase in both countries. Moreover, the regular Agricultural Drainage Reuse in Egypt has also enhanced Egypt’s Overall Water Use Efficiency. As for the Sustainability/ Depletion index, it is clear that Egypt faces a huge problem with the sustainability/depletion of its resources. Although, Libya has been known as a nation depending on non-renewable Groundwater resources, it appears that the relatively hue volume of Green Water Resources has unexpectedly brought the country’s sustainability index below 100%.

It has been indicated that there are some gaps in the Institutional setup of the Water Sector s of many N-AMCOW countries that hinders the availability of data related to Governance, although such data must be available at certain administrative and decision making levels. Egypt was the only country where

figures for the complaints related to Irrigation were found. Egypt, Tunisia and Libya, however reported values related to Groundwater wells permits and Volumes associated with such permits as indicated in table.23.

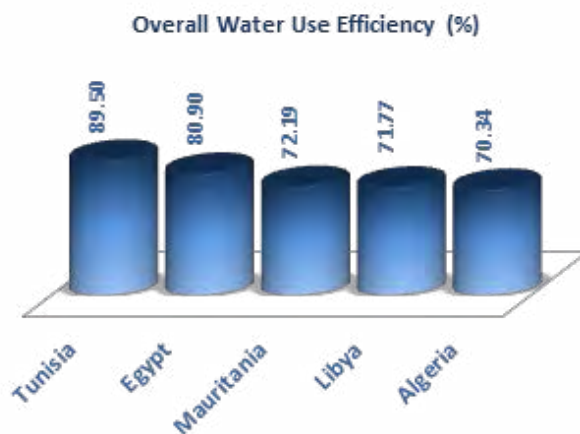


Figure 50. Overall Water Use Efficiency in the N-AMCOW Region

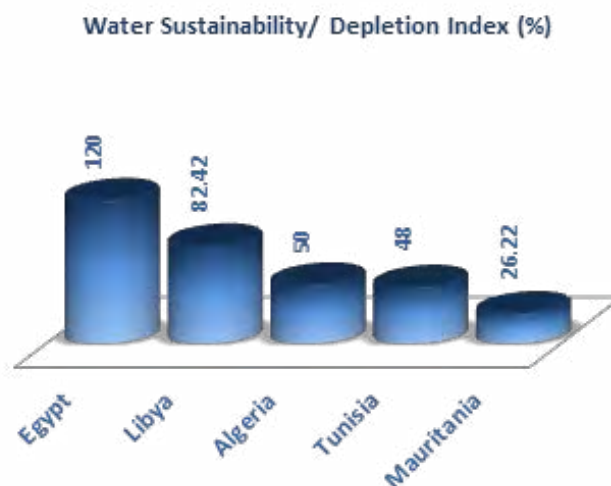


Figure 51. Water Sustainability/ Depletion Index

3.15. Water & International Relations

- a) **Transboundary water bodies' dependency Ratio:** the percent of annual volumes abstracted from transboundary water bodies to total annual available water resources.
- b) **Shared Waters related Bilateral/ Multilateral Agreements and/or Memorandums of Understanding and Cooperation Mechanisms:** The number of Bilateral or Multilateral agreements or other sort of cooperation a particular country is involved in. These agreements should be solely intended for transboundary water resources.

c) Number of Riparians Sharing all Shared Water Bodies

d) Number of Shared Water Resources

Table 24 shows the indicator values for this category.

Table 24. "Water & International Relations" Indicators Values

No	Code		Units	Algeria	Egypt	Libya	Mauritania	Tunisia	Region
*	15	Water & International Relations							
166	15-1	Transboundary Water Dependency Ratio	%	2	97	16	96	6.02	43.40
167	15-2	Shared Waters related Bilateral/ Multilateral Agreements and/or Memorandums of Understanding and Cooperation Mechanisms	Number		11	2	5	1	
168	15-3	Number of Riparians Sharing all Shared Water Bodies	Number		14	5		2	
169	15-4	Number of Shared Water Resources	Number		2	2		3	

Figure (52) shows the dependency ratio on shared Water Resources for MEWINA countries. Egypt and Mauritania have the highest dependency with values approaching 100%.

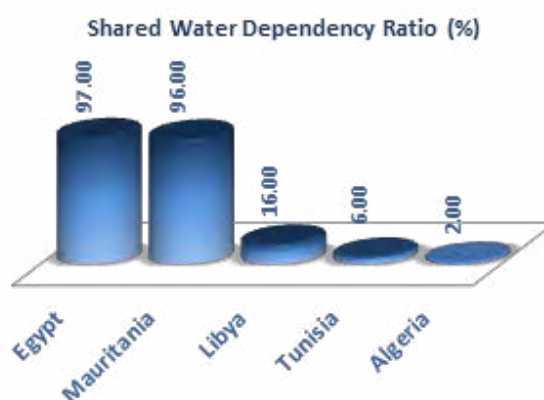


Figure 52. Shared Water Dependency Ratio

Figure (53) shows the total number of Agreements, Memorandum of Understandings, and cooperation protocols related to shared Resources in the MEWINA countries. Many of these cooperation mechanisms are between 2 or more MEWINA countries such as in the case of the North Western Sahara Aquifer System shared entirely between 3 MEWINA countries (Algeria, Libya, and Tunisia) and the Nubian Sandstone Aquifer System shared between Egypt and Libya in addition to Sudan and Chad. Egypt and Mauritania are active in developing cooperation mechanisms with their riparians in the Nile and Senegal Basins, respectively. Mauritania has 5 cooperation mechanisms, while Egypt has 14.

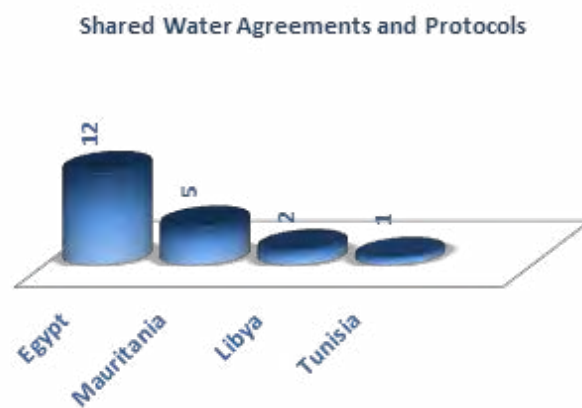


Figure 53. Shared Water Agreements and Protocols

The first MEWINA State of the Water report is a promising report that shows that all indicators are measurable when the adequate time is allocated and the suitable tools are present. More detailed values as well as historical trends for all indicators for all countries could be expected in future reports.

6. References

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Annexes

Algeria AMCOW Pan African M&E Performance Sheet

Country Background Information Sheet

Country Name: **Algeria**

Items

Information

1. Population trends for the last 4 years, and GDP.

Years	2000	2008	2009	2010	2011	2013
Urban pop.	18 250 000	000 214 24	24 688 000	25 185 000	25 702 000	27 090 000
Rural pop.	12 166 000	10 377 000	10 581 000	10 793 000	11 015 000	11 610 000
Total pop.	30 416 000	34 591 000	35 269 000	35 978 000	36 717 000	000 700 38
GDP (10 ⁹ USD)	54.790	170.989	138.119	161.979	188.681	277.400

2. Basis of the existing water sector Policy/ Reform and potential policy targets.

The important questions treated in the existing reformation of Water Sector:

In the context of the water crisis prevailing in the last 03 decades and after a long succession of droughts, public authorities decided to set up the question of the water first and foremost of 1st order by the creation in 1999 of a Ministry in charge of Water resources.

The new water policy, integrated within the framework of the National Plan of country planning (Horizons 2015-2025-2040) bases on a strategy recorded in the "water law" of August, 2005.

This law about which, forty application decrees were promulgated allow to have a legal framework renovated legal framework, creating the conditions of an integrated and modern management of water resources. It considers the definition of the public domain of the water, the not conventional resources, the planning of the arrangements with various terms, the principle of the integrated water resources management, the Public Private Partnership and the implementation of specialized Public institutions covering all the activities of the water as well as the device of training.

This priority given to the water sector was translated by a strong impulse of the intervention of the State on two major strategic axes:

1st axe: development of the hydraulic infrastructure: to answer the challenges of future, the infrastructural development was supported by a volume of public investments achieving at present 20 billion (over which period?)

2nd axe: institutional reform within the framework of the national approach of strengthening the governance

The big implemented construction works aim at insuring:

1. A greater water resource mobilization of the in under its conventional and not conventional forms and this, to strengthen the offer in water and reduce the vulnerability to the climate change.
2. The rehabilitation and the extension of the drinkable water supply systems, to fight against the losses and adapt networks as the evolution of the urbanization
3. The rehabilitation and the extension of the systems of purification to protect the living environment and the hydric ecosystems and develop the re-use of handled waters.
4. The modernization and the extension of irrigated areas to support the strategy of food safety.
5. The consolidation of the experiences of better governance, in particular regarding management of the public services of the water.

3. Knowledge of international and African Milestones on Water and Sanitation.

Which are the ones well known and used in the county? Specify how it is used.

- 1- African Convention on the Preservation of the Nature and the Natural Resources (Alger-Sept on 1968): “ States contracting parties make a commitment to adopt measures aiming at the preservation, in the use and in the development of the ground, the water, the flora and fauna... “
- 2-Conference of United Nations on the water(Mar del Plata-1977): “ definition of a platform of discussions on water issues at international level.
- 3-Le 1st Summit of the Earth (Rio of Janeiro-Juin1992)
- 4- The results(profits) of the various World Forums of the water: Casablanca (1997), The Hague (2000), Kyoto (2003), Mexico(Mexico City) (2006), Istanbul (2009), Marseille (2012)

- 5- Objectives of the development of the millennium -55ème AG-Nations Unies-2000
- 6-Le World Summit On the Sustainable Development (Johannesburg September 2002)
- The African Vision of the water for 2025.
- Creation of the AMCOW (Abuja-2002) and the Results of the various Ministerial Councils on the access to the water, the purification, the transboundary Basins , the integrated management, the groundwater resources, the monitoring - evaluation, the good governance, the financing....

Application: *the results and the recommendations of the various conferences allow to deepen the reflection on the water issues, s regarding planning by the implementation of a frame of medium and long-term planning (impact of the climate change of which it is necessary to take care, or on quite different problem which is on the agenda and it besides the water right...)*

4. Trend of the 3 latest reviews in national water Policy and Reforms.

Drivers of the Reviews:

- Have a frame of planning and a legal framework of governance
- Take care of the new needs
- Join the objectives of the Millennium
- Insure a better management and a better governance
- Introduce the use of waste water purified in farming
- operate the program of realization of desalination stations of the sea water
- Introduce the Public - Private Partnership
- define the Hydraulic Public domain
- Introduce the hydrological risk, the management of the perimeters of protection against the pollution and and the alert in the floods
- Define the integrated water resources management
- modernize the administration
- Strengthen the structures of training

Targeted Impacts and effectiveness

1-Mobilization of water resources: of 1999 this day, this effort of mobilization allows to have, in 2012, 78 dams with a total capacity of storage exceeding the 7, 5 billions of m3.

2-Program of Desalination of the sea water: objectives:

- Secure the AEP of big cities and coastal localities
- Reinstatement waters of the dams of the “telliennne” region towards high plateaus

Program:

- Realization of 13 desalination plants along all the coast, along the total capacity of production of 2,26 millions of m3 / j.

The biggest station is the one of Oran (500 000 m3 / j)

- Seven factories were already put into service (1 100 000 m3 / day)

3-the drinkable Water supply: the right for the access to the drinking water and to the purification is recognized by the law on the water. Indicators are:

- Rate of connecting: 1999: 78 %; 2012: 95 %
- Daily Subsidy(Endowment) per capita: 1999: 123 liters/j/hab/j/hab/j/hab.
- 2012: 170 liters/j/hab/j/hab/j/hab.

	<p>4-Assainissement:</p> <ul style="list-style-type: none"> - 138 water-treatment plants with a capacity settled by 11 million equivalents inhabitants and a volume of treatment of 700 million m³ / year. - The rate of connecting passed of 72 % in 1999, in 87 % in 2012. - The total shelf space of networks passed of 21 000 km in 1999 in 42 000km in 2012. - The program of realization of water-treatment plants will allow to develop the irrigation with long-term objectives (horizon 2030) of: 107 400 ha,
	<p>5-agricultural Hydraulics and irrigation:</p> <p>Over the period 1999-2011, surfaces irrigated in big, average or small hydraulics passed of 420 000 ha in 1999 in 1 160 000 ha is a 176 % increase.</p>
	<p>6-Governance of the water:</p> <ol style="list-style-type: none"> 1. The revision of the legal framework with a new law relative to the water promulgated in August, 2005, and about forty application decrees, 2. The modernization of the systems of public management (planning and financing of the investments, the management of the information, the normalization and the standardization), 3- The reorganization of the structures of the administration of the water as well as the statutory under guardianship revision of public institutions in the sense(direction) of a strengthening of their financial autonomy, 4- The creation of an authority of regulation of the public services of the water <ol style="list-style-type: none"> 5- The implementation of a frame(executive) of dialogue between all the actors of the water: <ul style="list-style-type: none"> - At the central level: a consultative national council for water resources - At the regional level: 5 tripartite committees in about 5 hydrographic basin agencies.
<p>5. Comments on the national water sector regarding the strengths, weaknesses, opportunities, threats and outstanding problems.</p>	<ul style="list-style-type: none"> - In Algeria where the resource in water is rare (550 m³ / year / hab.) and undergoes the impacts of climate change, the challenges are enormous because the demand in water remains always strong and it is necessary to produce every day more water for the populations in strong increase, the farming and the industry. This water has to be also good quality what requires efforts supported for the protection of the ecosystems. - In front of water shortages known between 2000-2002, the State operated a policy of the water to endow the country of important infrastructures to satisfy a demand in water in constant increase but anticipate its long-term evolution to strengthen and secure the access to the water and to the purification for all. - the impact of these investments was translated by a doubling of the subsid in drinking water per capita between 1970 and 2012 with a rate of connecting to the public networks which passed of 35 % in 1962 (year of the independence of Algeria) in 95 % in 2012 as a population which quadrupled since the independence.
	<ul style="list-style-type: none"> - the challenges remain constant but the granted efforts and the set up institutional frame allow to move forward that the problem of the water in a semi dry country as Algeria, begins to find a solution by the reassurance of the access to the drinking water and to the purification of the populations while clearing surpluses for the producing activities in particular the farming which consumes 65 % of capacities in water of the country.

Country Water and Sanitation Performances Evaluation Sheet

Country Name: **Algeria**

Performance Category	Country Information																																			
<p>1-1-Water and Energy</p> <p><u>Target:</u> Increase hydropower utilization by 10% from 2000 to 2015.</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: - Algeria, situated in dry zone and the availability of which in water is of the order of 500m³ / hab. / year has very reduced capacities regarding hydro energy. That's why the electricity is in its quasi-whole lot produced from fossil resources (gases, hydrocarbons). However, within the framework of the national program of adaptation to climate change, a new policy is being organized, favoring the turbinated surface waters , the use of the solar and wind energy and the biomass. ▪ Achievement: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Economically feasible hydropower Potential (P)</td> <td>25 412</td> <td>40 236</td> <td>42 769</td> <td>45 640</td> <td>48 426</td> <td style="color: red;">48 426</td> </tr> <tr> <td>-Installed hydropower capacity (C)</td> <td>53</td> <td>281</td> <td>342</td> <td>410</td> <td>479</td> <td style="color: red;">479</td> </tr> <tr> <td>-Hydropower utilization (Hpul = C/P) (%)</td> <td>0.21</td> <td>0.70</td> <td>0.80</td> <td>0.90</td> <td>0.99</td> <td style="color: red;">0.99</td> </tr> <tr> <td>Rate of increase R_{Hpul} (%) = $(Hpul_i - Hpul_{2000}) / Hpul_{2000}$</td> <td>0.00</td> <td>2.3333</td> <td>2.8095</td> <td>3.2857</td> <td>3.7143</td> <td style="color: red;">3.7143</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ▪ Sources of verification and Specific comments: - Ministry of the Energy and Appearances(Mines) and Assists National Communication of Algeria on Climate change in the CNUCC 	Years (i)	2000	2008	2009	2010	2011	2013	-Economically feasible hydropower Potential (P)	25 412	40 236	42 769	45 640	48 426	48 426	-Installed hydropower capacity (C)	53	281	342	410	479	479	-Hydropower utilization (Hpul = C/P) (%)	0.21	0.70	0.80	0.90	0.99	0.99	Rate of increase R_{Hpul} (%) = $(Hpul_i - Hpul_{2000}) / Hpul_{2000}$	0.00	2.3333	2.8095	3.2857	3.7143	3.7143
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	<ul style="list-style-type: none"> ▪ Specific Comments: Algeria is a country of oil and natural gas. The part of the hydraulic capacity in the park of electric production is very weak). This is dû in the insufficient number of the exploitable hydraulic sites and in the irregularity of the flows. The production of the electricity knew a strong growth in passing from 25 TWh in 2000 to 48 TWh in 2011, reflecting annual increase averages of 6 %. The power settled by the national park of electricity reached 8502 MW in 2008 against 5900 MW in 2000, what corresponds to a 44 % expansion. The consumption of the electricity registered an average increase of 6 % during this period. This growth includes all the categories of customers. The total number of subscribers reached in December, 2008 is 6, 3 millions. As for the rural electrification, the effort granted by the State during period 2000-2011 allowed more than 1, 3 million homes to be linked with the network. The rate of rural electrification was 1, 8 % a year during this period, what carries the rate of national electrification at the end of 2011 at the threshold of 98 %. 																																			
	<ul style="list-style-type: none"> ▪ Algeria joined the development of the renewable energies into its energy policy by the adoption of a legal framework favorable to the development of these energies, the realization of important infrastructures in this domain and the planning of important projects. Solar energy: due to its geographical situation, Algeria has one of the highest solar deposits(fields) to the world, considered at five billions the GWH / YEAR. The duration of sunstroke on laquasi whole lot of the national territory exceeds(overtakes) the 2500 hours annually and can reach(affect) the 3600 hours (high plateaus and Sahara). The received(successful) energy daily on a horizontal surface of 1m² is of the order of 5 kWh on the major part of the national territory, is meadows of 1700 kWh / m² / year in the North and 2 650 kWh / m² / year in the South of the country. 																																			

	<p>Wind energy: the wind resource in Algeria varies many from the place to another one. This is mainly of for topography and for a climate very diversified. Algeria to a regime of moderate wind (2 - 6 m/s). This energy potential can be exploited for the pumping of the water particularly on High plateaus.</p> <p>Geothermal energy: Jurassic limestone of the Algerian North which constitute important geothermal reservoirs, give birth to more than 200 thermal springs located mainly in the regions of the Northeast and the northwest of the country. Further south, the "continental intercalary" constitutes a vast geothermal reservoir which extends over several thousands of km². This reservoir, called collectively «nappe de l'albien» is exploited through drillings in more than 4 m³/s; the water of this table is in an average temperature of 57 °C.</p>																																										
<p>1-2-Water and Agriculture</p> <p><i>Targets:</i> -Increase water productivity Rain fed agriculture & Irrigation by 30% from 2000 to 2015.</p>	<ul style="list-style-type: none"> Specific actions taken so far for the milestone: Achievement on water productivity: <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Agricultural GDP (10⁹ USD) (A)</td> <td>4. 931</td> <td>11.114</td> <td>11.050</td> <td>13. 768</td> <td>19.434</td> <td>16. 793</td> </tr> <tr> <td>-Total Agri. Water withdrawal (10⁹ m³) (B)</td> <td>1.4</td> <td>2.9</td> <td>3.1</td> <td>3.3</td> <td>3.5</td> <td>6.0</td> </tr> <tr> <td>-Water Return to Environment (C)</td> <td>0.420</td> <td>0.870</td> <td>0.930</td> <td>0.990</td> <td>1.050</td> <td>1.8</td> </tr> <tr> <td>Water productivity (USD/m³) Wp=A/(B-C)</td> <td>5.03</td> <td>5.47</td> <td>5.09</td> <td>5.96</td> <td>7.93</td> <td>3.9</td> </tr> <tr> <td>Rate of increase $R_i Wp$ (%) = $(Wp_i - Wp_{2000})/Wp_{2000}$</td> <td>00</td> <td>1.07%</td> <td>1.21%</td> <td>1.357%</td> <td>1.5%</td> <td>3.28%</td> </tr> </tbody> </table>	Years (i)	2000	2008	2009	2010	2011	2013	-Agricultural GDP (10 ⁹ USD) (A)	4. 931	11.114	11.050	13. 768	19.434	16. 793	-Total Agri. Water withdrawal (10 ⁹ m ³) (B)	1.4	2.9	3.1	3.3	3.5	6.0	-Water Return to Environment (C)	0.420	0.870	0.930	0.990	1.050	1.8	Water productivity (USD/m³) Wp=A/(B-C)	5.03	5.47	5.09	5.96	7.93	3.9	Rate of increase $R_i Wp$ (%) = $(Wp_i - Wp_{2000})/Wp_{2000}$	00	1.07%	1.21%	1.357%	1.5%	3.28%
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<p>and</p> <p>-Increase the size of irrigated areas by 50% from 2000 to 2015</p>	<ul style="list-style-type: none"> Achievement on irrigated areas: <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Irrigated areas (IA) (10³ ha)</td> <td>450</td> <td>900</td> <td>960</td> <td>1,050</td> <td>1,050</td> <td>1,053</td> </tr> <tr> <td>Rate of increase $R_i IA$ (%) = $(IA_i - IA_{2000})/IA_{2000}$</td> <td>00</td> <td>100%</td> <td>113%</td> <td>133%</td> <td>157%</td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> Sources of verification and Specific comments: - National plan of the Water - Balance assessment 1962-2012 and perspectives of the sector of water resources - Ministry of Agriculture and the Rural Development. Ministry of Water resources. 	Years (i)	2000	2008	2009	2010	2011	2013	-Irrigated areas (IA) (10 ³ ha)	450	900	960	1,050	1,050	1,053	Rate of increase $R_i IA$ (%) = $(IA_i - IA_{2000})/IA_{2000}$	00	100%	113%	133%	157%																						
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Rate of increase $R_i IA$ (%) = $(IA_i - IA_{2000})/IA_{2000}$	00	100%	113%	133%	157%																																						
	<p>Comments:</p> <p>The implementation of the National Plan of Agricultural Development considerably boosted the farming sector which knew an important development due to the initiative of the farmers especially private who benefited from considerable material and financial advantages through the National Fund(Collection) of Agricultural Development (loans, state aid, realization of drillings and storage ponds, promotion(class) of the irrigation in the drip to reduce the losses to water, fairs and exhibitions(exposures), agricultural popularization, protection of vegetables).</p> <p>On the other hand, from 2000 till 2012, about 39 dams(roadblocks) are thrown(launched) or current(in class) (25 already ended for a capacity of 3.5 billions of m3).</p> <p>This dynamics allowed to increase appreciably the agricultural production irrigated and the creation and the conservation of agricultural jobs(uses), so limiting the drift from the land and assuring(insuring) the improvement of the living conditions of the population in rural areas.</p>																																										

<p>1-3-Water for multiple Uses</p> <p><u>Target:</u> Increase the Water Demand Satisfaction Index (WDSI) by 10% from 2000 to 2015.</p>	<p>Specific actions taken so far for the milestone:</p> <ul style="list-style-type: none"> - Greater mobilization of the resource in conventional water. - Use of non conventional resource particularly in farming (uncluttered waste water). - Realization before 2015 of 13 stations of desalination of the sea water (07 stations already put into service - Economy of the water and the governance of the water <p>Achievement:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- Total all sectors Water Demand (10⁹ m³)(A)</td> <td>30.416</td> <td>34.591</td> <td>35.269</td> <td>35.978</td> <td>36.717</td> <td>37</td> </tr> <tr> <td>-Total all sectors water supply (10⁹ m³)(B)</td> <td>3.25</td> <td>5.40</td> <td>5.80</td> <td>6.10</td> <td>6.40</td> <td>9,65</td> </tr> <tr> <td>- WDSI =B/A</td> <td>10.7%</td> <td>15.6%</td> <td>16.4%</td> <td>16.9%</td> <td>17.4%</td> <td>26%</td> </tr> <tr> <td>Rate of increase $R_i WDSI (\%) = (WDSI_i - WDSI_{2000}) / WDSI_{2000}$</td> <td>00</td> <td>45,8%</td> <td>53,3%</td> <td>57,9%</td> <td>62,6%</td> <td></td> </tr> </tbody> </table>	Years (i)	2000	2008	2009	2010	2011	2013	- Total all sectors Water Demand (10 ⁹ m ³)(A)	30.416	34.591	35.269	35.978	36.717	37	-Total all sectors water supply (10 ⁹ m ³)(B)	3.25	5.40	5.80	6.10	6.40	9,65	- WDSI =B/A	10.7%	15.6%	16.4%	16.9%	17.4%	26%	Rate of increase $R_i WDSI (\%) = (WDSI_i - WDSI_{2000}) / WDSI_{2000}$	00	45,8%	53,3%	57,9%	62,6%	
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	<p>Sources of verification and Specific comments:</p> <ul style="list-style-type: none"> - National plan of the Water - Balance assessment 1962-2012 and perspectives of the sector of water resources <p>Comments: Algeria is a dry country with low hydric potentialities, however efforts were granted to endow the country of important infrastructures to answer a demand in water in constant increase. The theoretical rate of 1000 m3 / hab. / year is too strong and does not suit inevitably in this kind of statistics. It is shown in certain studies as this rate can be returned unless 500 m3 / year / hab.</p>																																			
	<ul style="list-style-type: none"> - The big construction works operated since the beginning of decade 2000 aim at four strategic objectives: <ol style="list-style-type: none"> 1. Increase and secure the mobilization of conventional water resources (renewable and non renewable water) and not conventional (desalination and cluttered waste water) 2. Guarantee the access to the water and improve the quality of service through the rehabilitation and the modernization of the management of the systems of the drinkable water supply 3. Insure the access to the purification and protect the hydric ecosystems by means of the rehabilitation and the extension of the systems of purification and purge of waste water 4. To Support the strategy of alimentary security with the extension of the irrigated zones 																																			
<p>2.1. Basin and Transboundary water resources management</p> <p><u>Target:</u> Develop a national Water Efficiency Plan by 2015.</p>	<p>Specific actions taken so far for the milestone:</p> <p>The new implemented policy is inspired by the town and country planning policy, which sets as goal the creation of a dynamics of rebalancing of the territory, in particular the sustainable development of High plateaus and the South.</p> <p>The achievement of this objective requires to make big transfers, and to appeal to the not conventional resources and more particularly to the desalination of the sea water.</p> <p>A real political will exists and is translated by the implementation of new strategies of mobilization, transfer and resource management in water, accompanied with considerable financial means, as well as with numerous institutional, legal and organizational reforms,</p> <p>The importance of the investments granted through the various programs, was translated by tangible results, regarding satisfaction of water requirements both in quantity and in required quality.</p>																																			
	<p>Availability of Water Efficiency or IWRM Plan and Year of Adoption (1996):</p> <ul style="list-style-type: none"> - The law of August 4th, 2005 relative to the water established, for every natural hydrographic unit, a main plan of arrangement of the water resources which will have to determine, on the basis of the offer and of the demand in water, the objectives: <ul style="list-style-type: none"> - Of development of the arrangements of mobilization and transfer of waters between natural hydrographic units, by taking into account economic parameters, - Of use of water resources, in a prospect of sustainable management. <p>It was thus a question of creating at the level of every hydrographic region, a tool of dynamic planning of the water resources which will be updated in a permanent way and can be managed in a autonomous way by the body in charge of integrated water resources management under the authority of the ministry of water resources.</p>																																			
	<p>Elements of the policy and legal environment:</p> <ul style="list-style-type: none"> - The law n°05-12 of August 04th, 2005 relative to the water <p>To dedicate the new policy of the water a new law was promulgated in 2005: Law n°05-12 of August 04th, 2005 relative to the water</p> <p>The basic principles of the new law are:</p>																																			

	<p>The management of the resource Unitarian, united, joint management, and integrated(joined) on the scale of the Catchment basin Economic management Compatibility with the town and country planning policy and of environmental protection.</p> <p>The regime of the concession: Opening of the diet(regime) of concession to the moral persons of private law, gathering(combining) the required qualifications.</p> <p>The drinkable Water supply: Strengthening of the systems of quality control.</p>
	<p>Waste water: New capacities(measures) relative to the obligation(bond) of purge of waste water of large cities and industrial units upstream to dams(roadblocks).</p> <p>The fight against pollution: Obligation(Bond) made for the industrial units to proceed to the putting in conformity of their installations with the standards of rejections(discharges) tells that fixed by the regulations in force and to proceed to the adequate treatment(processing) of their effluents.</p> <p>The planning of the mobilization and the use of the resources in waters: Institution of master plans of arrangement and use of waters</p>
	<p>Regarding financial capacities: Introduction of incentive measures of the State to encourage any arrangement(development) likely to allow the economy, the valuation and the protection of the resources. The spending concerned to the purification is covered by the pricing for the water.</p> <p>Regarding penalties: Increase of the severity of the penalties in case of violation of statutory provisions. Extension of the privileges of Wali regarding application of the penalties.</p> <p>Protection and conservation groundwater water resources: Institution of the perimeters of protection</p>
	<p>Elements of the institutional arrangements:: Within the framework of the institutional reforms, four big national bodies were created (ADE, ONA, ANBT, ONID) as well as 05 hydrographic basin agencies</p> <p>The Algerian of Waters (ADE): This public institution, created with a status of EPIC(INDUSTRIAL AND COMMERCIAL PUBLIC COMPANY) has for mission to take care Public services of water through all the national territory.</p> <p>Strategic objectives fixed to this new Establishment are:</p> <ol style="list-style-type: none"> 1. Insure a better satisfaction of the drinking water requirements of the users. 2. Insure a more efficient management of the resource by reducing the wasting (fight against the leaks, the illicit pricking), by the rehabilitation of networks, by the professionalization of all the workers. 3. Give to the water its real economic value to cover expenses of functioning and maintenance. <p>The National office of the sanitation (ONA): One of the essential missions of this office will consist in insuring a good management of sewer systems and Water-treatment plants, and in developing a policy of re-use of waste water purified in the industry, the farming, even later for the artificial refill of ground-water sheets.</p> <p>The National Agency of Dams and the Big Transfers (ANBT) This Agency has for mission the project ownership and the project management for all which concerns the mobilization of waters by dams and the big transfers.</p>
	<p>The National office of the Irrigation and the Drainage (ONID): This Establishment insures the project ownership and the project management for all which concerns agricultural hydraulics “ on a national scale.</p>

	<p>Hydrographic Basin agencies (ABH): These Agencies among five, translate in reality, the principle of integrated water management on the scale of the hydraulic basin, held within the framework of the new water policy. These Agencies have for missions: - To develop the hydraulic land registry on the scale of the catchment basin, - To participate in the elaboration of the master plans of arrangement, of mobilization and allocation of water resources - To participate in the operations of supervision of the state of pollution and definition of the technical specifications relative to the wastewater disposals and to the devices of their purification. - To lead any actions of information and raising awareness of the domestic, industrial and agricultural users to promote the rational use and the protection of water resources.</p>																																				
	<p>At the same time it was create organs of dialogue, in the form of committees of catchment basins constituted by the representatives of the State, the local authorities and the users. These committees have for mission to discuss and to formulate notices on all the water-related questions, on the scale of the catchment basin.</p> <p>The institution of the tools of planning (PNE, PEDARE, committees of catchment basins, Information systems), had a beneficial impact on the planning and the management of the projects. The concept of integrated water resources management introduced on the occasion of these reforms allowed a sensitive improvement of the quality of the public services of the water, the purification and the agricultural hydraulics.</p>																																				
	<p>Element of the financial structure:</p> <p>The financing is in its majority insured by the State which however defined the rules of governance in particular regarding pricing and regarding covering(collection) of the costs of the services(departments) assured(insured) regarding water supply and in purification. - For the desalination, the units are realized according to the principle of the BOO (Built, Own, Operate). - For the management of big cities: implementation of the conditions to develop the delegation of management of the public services of the water and the purification with deprived operators (Public Private Partnership)</p>																																				
	<p>Management tools: master plans of arrangement and use of waters</p> <p>▪ Sources of verification and Specific comments: legal texts</p>																																				
<p>2.2. Not applicable 2.3. Not applicable 2.4. Rain water</p> <p><u>Target:</u> Increase the share of rainwater use in total municipal water consumption up to 10% by 2015.</p>	<p>▪ Specific actions taken so far for the milestone: - In Algeria, the collection of rainwater's by roofs for the domestic needs is practically non-existent in urban zones. In rural areas, it is practiced for the abreuvement of the livestock or for the small irrigation of much reduced plots of land.</p> <p>▪ Achievement:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Total municipal water supply(10⁹ m³)(A)</td> <td>2.1</td> <td>2.7</td> <td>2.8</td> <td>2.9</td> <td>3.1</td> </tr> <tr> <td>- Rainwater use (10⁹ m³)(B)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>-Water use from other sources Desalination (10⁹ m³)(C)</td> <td>0.105</td> <td>0.142</td> <td>0.215</td> <td>0.405</td> <td>0.515</td> </tr> <tr> <td>-Total municipal water consumption (Twc = A+B+C)</td> <td>2.205</td> <td>2.842</td> <td>3.015</td> <td>3.305</td> <td>3.615</td> </tr> <tr> <td>Percentage of rainwater use pRu (%) = B/Twc .</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>▪ Sources of verification and Specific comments: - MRE - DAEP(Direction de l'Alimentation en eau potable</p>	Years (i)	2008	2009	2010	2011	2013	-Total municipal water supply(10 ⁹ m ³)(A)	2.1	2.7	2.8	2.9	3.1	- Rainwater use (10 ⁹ m ³)(B)	0	0	0	0	0	-Water use from other sources Desalination (10 ⁹ m ³)(C)	0.105	0.142	0.215	0.405	0.515	-Total municipal water consumption (Twc = A+B+C)	2.205	2.842	3.015	3.305	3.615	Percentage of rainwater use pRu (%) = B/Twc .	0	0	0	0	0
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<p>3.1. Urban Water Supply</p> <p>3.2. Urban Sanitation</p> <p>3.3. Rural Water Supply</p> <p>3.4. Rural Sanitation and Hygiene</p>	<ul style="list-style-type: none"> Specific actions taken so far for the milestone: <ul style="list-style-type: none"> - Algeria committed during decade 2000, a vast program of rehabilitation and extension of the city networks of drinking water distribution and purification, as well as the capacity building of management of the public service of the water. Thanks to these actions, the rate of connecting of the population to the public network of AEP passed from 78 % in 1999, to 94 % in 2011, with an average subsidy of 170 l / hab. / j. - A development policy of the sanitation sector was organized on the other hand with objective: <ol style="list-style-type: none"> 1. Insure the management, the rational exploitation and the maintenance of sewer systems and STEP; 2. Clarify the respective responsibilities of companies and municipalities 3. Set up financial means necessary for the financing of the operating costs of networks and purge 4. See again the system of pricing for the purification The creation of the National office of the Purification (ONA) 2001s'inscrit registers within the framework of this policy. 																																																								
<p><u>Target:</u> Reduce by 50% from 1990 to 2015, the proportion of the population without improved drinking water source, and the proportion without improved sanitation facility (Urban/Rural / Total).</p>	<p>Achievement in water supply:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>Access rate are not differentiated for the urban and rural</td> <td>78%</td> <td>91%</td> <td>92%</td> <td>93%</td> <td>94%</td> <td>95%</td> </tr> <tr> <td>-Total access (%) (W)</td> <td>78%</td> <td>91%</td> <td>92%</td> <td>93%</td> <td>94%</td> <td>95%</td> </tr> <tr> <td>Rate of Inaccessibility reduction for water $IR_{wat} (\%) = (W_i - W_{1990}) / (100 - W_{1990})$</td> <td>00</td> <td>59%</td> <td>63.6%</td> <td>68%</td> <td>72.7%</td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> Achievement in improved sanitation: <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>Access rate are not differentiated for the urban and rural</td> <td>72%</td> <td>84%</td> <td>85%</td> <td>86%</td> <td>86%</td> <td>87%</td> </tr> <tr> <td>-Total access (%) (S)</td> <td>72%</td> <td>84%</td> <td>85%</td> <td>86%</td> <td>86%</td> <td>87%</td> </tr> <tr> <td>Rate of Inaccessibility reduction for sanitation $IR_{san} (\%) = (S_i - S_{1990}) / (100 - S_{1990})$</td> <td>00</td> <td>42.8%</td> <td>46.4%</td> <td>50%</td> <td>50%</td> <td>53%</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Sources of verification and Specific comments: <ul style="list-style-type: none"> - National plan of the Water - Balance assessment 1962-2012 and perspectives of the sector of water resources 	Years (i)	1990	2008	2009	2010	2011	2013	Access rate are not differentiated for the urban and rural	78%	91%	92%	93%	94%	95%	-Total access (%) (W)	78%	91%	92%	93%	94%	95%	Rate of Inaccessibility reduction for water $IR_{wat} (\%) = (W_i - W_{1990}) / (100 - W_{1990})$	00	59%	63.6%	68%	72.7%		Years (i)	1990	2008	2009	2010	2011	2013	Access rate are not differentiated for the urban and rural	72%	84%	85%	86%	86%	87%	-Total access (%) (S)	72%	84%	85%	86%	86%	87%	Rate of Inaccessibility reduction for sanitation $IR_{san} (\%) = (S_i - S_{1990}) / (100 - S_{1990})$	00	42.8%	46.4%	50%	50%	53%
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<p>4.1. Adaptation to Climate Change</p> <p><u>Target:</u> Develop and implement, at least 1 Climate Change Adaptation Strategy by 2015.</p>	<ul style="list-style-type: none"> Specific actions taken so far for the milestone (New initiatives to improve resilience): Existence of a National Climate Change Adaptation Strategy and Year of adoption: <ul style="list-style-type: none"> - the Ministry of the Environment and country planning coordinates the " National Climate Plan " as well as the National plan of country planning in which become integrated all the sectors and into horizons 2025-2040. - a national Agency of Climate change was so created. Existence of a Actions Plans on Water for Climate Change resilience: <ul style="list-style-type: none"> -The National Water Plan was developed by taking care of the impact of climate change on water resources (available Study) as well as of the measures of adaptation Existence of Programs for implementing the Actions plans: <ul style="list-style-type: none"> - The National Water Plan is the program for implementing the Actions plans for the sector of Water resources. Sources of verification and Specific comments: <ul style="list-style-type: none"> - ministry of water resources - Ministry of the Environment 																																																								

<p>4.2. Water-related Hazards</p> <p><u>Target:</u> Establish at least 1 Early warning System for disaster prevention at national level by 2015.</p>	<p>Specific actions taken so far for the milestone (water disaster prevention initiatives):</p> <p>Hazards connected in:</p> <ul style="list-style-type: none"> - Drought: network of pluviometric observation and premature alert: the national agency of the hydraulic resources publishes(edits) monthly a bulletin on the evolution of the pluviometry and the hydric deficits. The National office of the Meteorology publishes(edits) a bulletin of seasonal <u>forecasts</u>. ▪ when due of 03 months. - floods: - a special weather report is broadcast(diffused) in case of heavy rain. - A mapping(cartography) of the flooded and easily flooded zones is available. - Two systems of alert and forecast of floods are operational. - An operation of generation of this system is in progress for all the national territory
	<ul style="list-style-type: none"> ▪ - Water quality: a network of surveillance(supervision) of the quality of superficial and subterranean waters is operational. - Management of the coast: an agency under the supervision of the Ministry of the Environment was create in this objective. - Wet zones: these are listed, classified (Ramsar Convention) and are the object of follow-up and conservation. <p>9.Existence of Early Warning Disaster prevention System and Year of establishment: yes L'Etat has create in 2010 a delegation at the natural risks:</p> <p><u>Elements on Knowledge of risks:</u> - identified and studied risks Mapping(Cartography), intensity, frequency, duration.</p> <p><u>Elements on Monitoring, analysis and forecasting of the hazards:</u> - The <u>Monitoring</u> is insured in a regular way. For the floods, the network of observation exists but it requires being totally automated.</p> <p><u>Elements on Communication or dissemination of alerts and warnings:</u> - broadcasting of bulletin of alert (paper, radio, TV)</p>
	<p><u>Elements on Local capabilities to respond to the warnings received:</u> - The local capabilities require to be although strengthened the raising awareness and the mobilization is very strong. There is locally a Scheme to deal with major civil emergencies (organization of the help) which is activated désla alert meadow of level 1.</p> <ul style="list-style-type: none"> ▪ Sources of verification and Specific comments: - Ministries of water resources, and - Ministry of environment and country planning, and the Inside. - National coordination assure insured by the Ministry of the Interior
<p>5.1. Institutional arrangements</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: ▪ Existence of Water sector policy that reflects good governance principles, and Year of latest update:
<p>5.2. Ethics, transparency, empowerment</p> <p>5.3. Public and private roles</p>	<p>Elements on Partnership and commitment:</p> <ul style="list-style-type: none"> - 05 big cities are managed according to the principle of the Public Private Partnership for the water and the purification - 13 desalination stations realized according to the BOO. - Hydraulic works are managed according to the model of the concession (water-treatment plants, or of water treatment)

<p>5.4. Right to water 5.5. Regulatory approaches</p> <p><u>Target:</u> Institute/update, by 2015, water sector policy reforms that reflect good governance principles of:</p>	<p>Elements on Ethics - transparency, equity and fairness: - Contracts are concluded in the principle of the transparency and the equity. A law carrying(wearing) regulations of procurement contracts (presidential Decree N ° 10-236 du07 Oct. 2010) organizes this approach(initiative). The submissions are the object of a public opening.</p> <p>Elements on Responsibility and accountability: The same decree 10-236 clarifies rules and defines the penalties</p> <p>Elements on Inclusiveness, participation, predictability and responsiveness: - See the decree 10-236</p> <p>Elements on Coherence: - A planning is insured at the level of the ministry of the water resources which appreciates the opportunity of the operation. It is afterward submitted to the Ministry of Finance for examination and approval by the arbitration committee.</p>																								
<p>(i) partnership commitment; (ii) ethics -transparency, equity and fairness; (iii) responsibility and accountability; (iv) inclusiveness, participation, predictability and responsiveness; and (v) coherence.</p>	<p>Sources of verification and Specific comments: - ministry of water resources - The Ministry of Finance - Newspaper Officiel-Décret 10-236</p>																								
<p>6.1. Financing Local Authorities</p> <p><u>Targets:</u> -Allocate immediately at least 0.5 % of GDP to sanitation & hygiene.</p>	<p>Specific actions taken so far for the milestone: -</p> <p>Achievement for GDP allocation:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- GDP (A_1) (10^9 US \$)</td> <td>170.989</td> <td>138.119</td> <td>161.979</td> <td>188.681</td> <td>277.400</td> </tr> <tr> <td>- Sanitation and Hygiene Budget (B_1) (10^9 US \$)</td> <td>0.888</td> <td>0.514</td> <td>1.153</td> <td>1.542</td> <td></td> </tr> <tr> <td>Percentage of GDP to Sanitation and Hygiene gdpSH (%) = B_1/A_1</td> <td>0.52</td> <td>0.37</td> <td>0.71</td> <td>0.82</td> <td></td> </tr> </tbody> </table>	Years (i)	2008	2009	2010	2011	2013	- GDP (A_1) (10^9 US \$)	170.989	138.119	161.979	188.681	277.400	- Sanitation and Hygiene Budget (B_1) (10^9 US \$)	0.888	0.514	1.153	1.542		Percentage of GDP to Sanitation and Hygiene gdpSH (%) = B_1/A_1	0.52	0.37	0.71	0.82	
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<p>and</p> <p>-Allocate immediately 5% of national budget for water & sanitation.</p>	<p>Achievement for national budget allocation:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- Total National Budget (A_2) (10^9 US \$)</td> <td>2,72</td> <td>2.57</td> <td>3,28</td> <td>2,99</td> <td>2,61</td> </tr> <tr> <td>- Water and Sanitation Budget (B_2) (10^9 US \$)</td> <td>1.806</td> <td>1.265</td> <td>2.411</td> <td>2.695</td> <td></td> </tr> <tr> <td>Percentage of national Budget to Water and Sanitation BdgWS (%) = B_2/A_2</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> <td></td> </tr> </tbody> </table> <p>Sources of verification and Specific comments: Water resources Ministry (Planning and economic affairs Direction)</p>	Years (i)	2008	2009	2010	2011	2013	- Total National Budget (A_2) (10^9 US \$)	2,72	2.57	3,28	2,99	2,61	- Water and Sanitation Budget (B_2) (10^9 US \$)	1.806	1.265	2.411	2.695		Percentage of national Budget to Water and Sanitation BdgWS (%) = B_2/A_2	xxxx	xxxx	xxxx	xxxx	
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<p>6.2. Pricing Strategies</p> <p>6.3. Pro-poor financing Strategies</p> <p><u>Target:</u> Set by 2015, water tariff system that addresses</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: - ▪ Describe the Water Tariff Structure: ✓ <i>Lifeline Water (l/ca/day):</i> XX ✓ <i>Minimum salary of the population (local currency-DZD-):</i> 1500 ✓ <i>Rate (USD or EURO/local currency):</i> 1 euro=103 DZD 1 US\$=80 DZD <p>Tariff Structure:</p> <table border="1"> <thead> <tr> <th>Consumption categories (m³)</th> <th>Rate (local currency)</th> </tr> </thead> <tbody> <tr> <td>< 25 m³</td> <td>1 6.30 DZD / m³</td> </tr> <tr> <td>26 m³ à 55 m³</td> <td>2 20.47 DZD / m³</td> </tr> <tr> <td>56 m³ à 82 m³</td> <td>3 34.65 DZD / m³</td> </tr> <tr> <td>> 82 m³</td> <td>4 40.95 DZD / m³</td> </tr> <tr> <td colspan="2">Any other specific charge:</td> </tr> <tr> <td colspan="2">- Pollution</td> </tr> <tr> <td colspan="2">- economy of the water</td> </tr> <tr> <td colspan="2">- Quality</td> </tr> <tr> <td colspan="2">- purification</td> </tr> </tbody> </table>	Consumption categories (m ³)	Rate (local currency)	< 25 m ³	1 6.30 DZD / m ³	26 m ³ à 55 m ³	2 20.47 DZD / m ³	56 m ³ à 82 m ³	3 34.65 DZD / m ³	> 82 m ³	4 40.95 DZD / m ³	Any other specific charge:		- Pollution		- economy of the water		- Quality		- purification	
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<p>7.1. Education and capacity development</p> <p><u>Target:</u> To be identified.</p>	<ul style="list-style-type: none"> ▪ <i>Not be reported.</i> 																				
<p>7.2. Information</p> <p><u>Target:</u> Enhance by 2016, the national water and sanitation Monitoring, Evaluation and Reporting (M&E, &R) Systems in a way to be in line with the pan African M&E.</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: ▪ Existence of national Water and Sanitation M&E, & R System, and Year of Establishment. <p>Systems of Monitoring and evaluations exist partially at the level of certain bodies of the Sector (SEAAL-SEOAR-SEACO) But a real M/E system is not still operational on the scale of the Sector. The System which exists is embryonic and does not obey the usual procedures</p> <table border="1"> <thead> <tr> <th>Items</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>-New Elements incorporated</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> </tr> <tr> <td>-Drivers</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> </tr> </tbody> </table> <p>Elements of the pan African M&E incorporated:</p> <p>The African Northern Region introduces on financing of the African FAE / BAD and with the support of the AMCOW, a project of Monitoring and Evaluation (MEWINA), that must allow to strengthen in 06 countries the existing systems.</p> <ul style="list-style-type: none"> ▪ Sources of verification and Specific comments: -FAE, BAD, AMCOW 	Items	Year 1	Year 2	Year 3	2011	-New Elements incorporated	xxxx	xxxx	xxxx	xxxx	-Drivers	xxxx	xxxx	xxxx	xxxx					
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<p>7.3. Water and Technologies <u>Target:</u> To be identified.</p>	<ul style="list-style-type: none"> ▪ <i>Not be reported.</i>
<p>7.4. Professional Networks/ Associations <u>Target:</u> To be identified.</p>	<ul style="list-style-type: none"> ▪ <i>Not be reported.</i>

Egypt AMCOW Pan African M&E Performance Sheet

Country Background Information Sheet

Country Name: **Egypt**

Items	Information																																													
1. Population trends for the last 4 years, and GDP.	<table border="1"> <thead> <tr> <th>Years</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>Urban pop.</td> <td>27,123,000</td> <td>32,353,000</td> <td>33,083,000</td> <td>33,833,000</td> <td>34,516,000</td> </tr> <tr> <td>Rural pop.</td> <td>36,728,000</td> <td>42,876,000</td> <td>43,842,000</td> <td>44,895,000</td> <td>45,894,000</td> </tr> <tr> <td>*Total pop.</td> <td>63,860,000</td> <td>75,229,000</td> <td>76,925,000</td> <td>78,728,000</td> <td>80,410,000</td> </tr> <tr> <td>GDP (10⁶ LE)</td> <td>855,302</td> <td>994,055</td> <td>1,150,620</td> <td>1,309,905</td> <td>855,302</td> </tr> </tbody> </table> <p>*Last census was conducted in 2006. (2012 Statistical year book, CAPMAS)</p>	Years	2000	2008	2009	2010	2011	Urban pop.	27,123,000	32,353,000	33,083,000	33,833,000	34,516,000	Rural pop.	36,728,000	42,876,000	43,842,000	44,895,000	45,894,000	*Total pop.	63,860,000	75,229,000	76,925,000	78,728,000	80,410,000	GDP (10 ⁶ LE)	855,302	994,055	1,150,620	1,309,905	855,302															
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2. Basis of the existing water sector Policy/ Reform and potential policy targets.	<p><i>Important issues addressed in the existing Water Sector Reform?</i></p> <ul style="list-style-type: none"> - Bridging water supply / demand deficit. - Seawater intrusion and water quality deterioration. - Improving domestic water supply and sanitation access. - Review and redirection of irrigated agricultural policies. - Increase water use efficiency. - Institutional capacity building. - Integrated water resources management. - Low Water Tariffs and Poor Recovery Rates 																																													
3. Knowledge of international and African Milestones on Water and Sanitation.	<p><i>Which are the ones well known and used in the county? Specify how it is used.</i></p> <ul style="list-style-type: none"> - Agenda 21-Rio principles: as a general guide for sustainable use of water for development. - The Dublin principles: as a general guide for sustainable use of water for development. - UN Millennium Development Goals (MDGs): as a measure of progress towards achieving MDGs. - African Water Vision 2025: as a base for updating plans and as a measure of progress. - Sharm-el-Sheikh Declaration: as a base for updating plans to accelerate meeting water supply and sanitation goals. 																																													
4. Trend of the 3 latest reviews in national water Policy and Reforms.	<table border="1"> <thead> <tr> <th>Years</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>Drivers of the Reviews</td> <td>-Reducing increasing water deficits</td> <td>-Reducing increasing water deficits</td> <td>-Reducing increasing water deficits</td> <td>-Reducing increasing water deficits</td> </tr> <tr> <td></td> <td>-Decreasing water quality decline</td> <td>-Decreasing water quality decline</td> <td>-Decreasing water quality decline</td> <td>-Decreasing water quality decline</td> </tr> <tr> <td></td> <td>-Improving service levels</td> <td>-Improving service levels</td> <td>-Improving service levels</td> <td>-Improving service levels</td> </tr> <tr> <td></td> <td>-Increasing agricultural area with the same water use</td> <td>-Increasing agricultural area with the same water use</td> <td>-Increasing agricultural area with the same water use</td> <td>-Increasing agricultural area with the same water use</td> </tr> <tr> <td></td> <td>-Optimize water allocation to different sectors</td> <td>-Optimize water allocation to different sectors</td> <td>-Optimize water allocation to different sectors</td> <td>-Optimize water allocation to different sectors</td> </tr> <tr> <td>Targeted Impacts and effectiveness</td> <td>-Decreasing deficits</td> <td>-Decreasing deficits</td> <td>-Decreasing deficits</td> <td>-Decreasing deficits</td> </tr> <tr> <td></td> <td>-Improving quality</td> <td>-Improving quality</td> <td>-Improving quality</td> <td>-Improving quality</td> </tr> <tr> <td></td> <td>-Improving services</td> <td>-Improving services</td> <td>-Improving services</td> <td>-Improving services</td> </tr> </tbody> </table>	Years	2008	2009	2010	2011	Drivers of the Reviews	-Reducing increasing water deficits	-Reducing increasing water deficits	-Reducing increasing water deficits	-Reducing increasing water deficits		-Decreasing water quality decline	-Decreasing water quality decline	-Decreasing water quality decline	-Decreasing water quality decline		-Improving service levels	-Improving service levels	-Improving service levels	-Improving service levels		-Increasing agricultural area with the same water use	-Increasing agricultural area with the same water use	-Increasing agricultural area with the same water use	-Increasing agricultural area with the same water use		-Optimize water allocation to different sectors	-Optimize water allocation to different sectors	-Optimize water allocation to different sectors	-Optimize water allocation to different sectors	Targeted Impacts and effectiveness	-Decreasing deficits	-Decreasing deficits	-Decreasing deficits	-Decreasing deficits		-Improving quality	-Improving quality	-Improving quality	-Improving quality		-Improving services	-Improving services	-Improving services	-Improving services
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5. Comments on the national water sector regarding the strengths, weaknesses, opportunities, threats and outstanding problems.

- Strengths: a) a national water strategy exists, b) a ministry for water resources has been established, c) strong official commitment to the water sector, d) specialized institutions for water supply and distribution exist, e) skilled workforce exists, f) financing is available with many major projects under execution, g) rising water awareness, h) favorable political climate
- Weaknesses: a) weak governance and institutional capacities, b) lack of data and information for water quality, c) decentralization efforts is lagging, d) inefficient communications with water resources transboundary countries
- Opportunities: a) NWRP monitoring and evaluation will provide necessary information for better planning and management of the water sector in Egypt, b) HCWW achieved great success in operation and management of WSS in Egypt, c) establishing the new ministry of infrastructure will help better manage WSS and provide required resources to provide safe drinking water and sanitation to urban and rural Egypt
- Threats: a) water scarcity and quality degradation, b) multiplicity of transboundary basins, c) climate change and desertification, d) political instability, e) food sufficiency syndrome
Outstanding problems: a) continuing deficit, b) low standard of service, c) inefficiency of utilization, d) water pricing and financing, e) Conflict over Egypt's share of Nile basin

Country Water and Sanitation Performances Evaluation Sheet

Country Name: **Egypt**

Performance Category	Country Information																																				
<p>1.1. Water and Energy</p> <p><i>Target:</i> Increase hydropower utilization by 10% from 2000 to 2015.</p>	<p>§Specific actions taken so far for the milestone: According to the 2007 / 2012 government plan, capacities of 82 megawatt are added to the system, of which 64 megawatt is added within the Plan's first year 2007/2008.</p> <p>▪Achievement:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>-Economically feasible hydropower Potential (P)</td> <td>5.1</td> <td>5.1</td> <td>5.1</td> <td>5.1</td> <td>5.1</td> </tr> <tr> <td>-Installed hydropower capacity (C)</td> <td>2.81</td> <td>2.875</td> <td>2.875</td> <td>2.875</td> <td>2.892</td> </tr> <tr> <td>-Hydropower utilization ($Hpul = C/P$)</td> <td>0.55</td> <td>0.56</td> <td>0.56</td> <td>0.56</td> <td>0.57</td> </tr> <tr> <td>Rate of increase $R_i Hpul(\%) = (Hpul_i - Hpul_{2000})/Hpul_{2000}$</td> <td>0.00%</td> <td>2.31%</td> <td>2.31%</td> <td>2.31%</td> <td>2.92%</td> </tr> </tbody> </table>	Years (i)	2000	2008	2009	2010	2011	-Economically feasible hydropower Potential (P)	5.1	5.1	5.1	5.1	5.1	-Installed hydropower capacity (C)	2.81	2.875	2.875	2.875	2.892	-Hydropower utilization ($Hpul = C/P$)	0.55	0.56	0.56	0.56	0.57	Rate of increase $R_i Hpul(\%) = (Hpul_i - Hpul_{2000})/Hpul_{2000}$	0.00%	2.31%	2.31%	2.31%	2.92%						
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	<p>§Sources of verification: - National water Resources Plan (2005) - Government Plan 2007/2012</p> <p>§Specific comments: - This target was announced in a continent wide political declaration but apparently it cannot be applied on each country level since most countries cannot realise it due to lack of resources. Accordingly, comparison between countries within this target might not be realistic.</p>																																				
<p>1.2. Water and Agriculture</p> <p><i>Targets:</i> -Increase water productivity Rain fed agriculture & Irrigation by 30% from 2000 to 2015.</p> <p><i>And</i> -Increase the size of irrigated areas by 50% from 2000 to 2015</p>	<p>§Specific actions taken so far for the milestone: - Implementation of the irrigated land horizontal expansion plan. Target is to increase the irrigated land to about 11 million feddans by 2017.</p> <p>▪Achievement on water productivity:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>-Agricultural GDP (109 LE) (A)</td> <td>60</td> <td>103.30</td> <td>106.57</td> <td>110.28</td> <td>113.28</td> </tr> <tr> <td>-Total Agri. Water withdrawal ($10^9 m^3$)(B)</td> <td>57.8</td> <td>60</td> <td>60</td> <td>61</td> <td>60.9</td> </tr> <tr> <td>--Water Return to Environment (C)</td> <td>18.5</td> <td>17.15</td> <td>25.44</td> <td>23.21</td> <td>22.90</td> </tr> <tr> <td>Water productivity (LE/m³) $Wp=A/(B-C)$</td> <td>1.53</td> <td>2.41</td> <td>3.08</td> <td>2.92</td> <td>2.98</td> </tr> <tr> <td>Rate of increase $R_i Wp(\%) = (Wp_i - Wp_{2000})/Wp_{2000}$</td> <td>0%</td> <td>58%</td> <td>102%</td> <td>91%</td> <td>95%</td> </tr> </tbody> </table>	Years (i)	2000	2008	2009	2010	2011	-Agricultural GDP (109 LE) (A)	60	103.30	106.57	110.28	113.28	-Total Agri. Water withdrawal ($10^9 m^3$)(B)	57.8	60	60	61	60.9	--Water Return to Environment (C)	18.5	17.15	25.44	23.21	22.90	Water productivity (LE/m³) $Wp=A/(B-C)$	1.53	2.41	3.08	2.92	2.98	Rate of increase $R_i Wp(\%) = (Wp_i - Wp_{2000})/Wp_{2000}$	0%	58%	102%	91%	95%
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<p>1.3. Water for multiple Uses</p> <p><i>Target:</i> Increase the Water Demand Satisfaction Index (WDSI) by 10% from 2000 to 2015.</p>	<p>Specific actions taken so far for the milestone: - Several actions have been taken to achieve this target but demand increases mask the impact of those actions.</p> <p>▪Achievement:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>- Total all sectors Water Demand (A)</td> <td>63.31</td> <td>74.44</td> <td>76.10</td> <td>77.84</td> <td>79.60</td> </tr> <tr> <td>- Total all sectors water supply (B)</td> <td>60.46</td> <td>70.23</td> <td>70.03</td> <td>74</td> <td>73.8</td> </tr> <tr> <td>- WDSI =B/A</td> <td>0.96</td> <td>0.94</td> <td>0.92</td> <td>0.95</td> <td>0.93</td> </tr> <tr> <td>Rate of increase $R_i WDSI(\%) = (WDSI_i - WDSI_{2000}) / WDSI_{2000}$</td> <td>0%</td> <td>-1%</td> <td>-4%</td> <td>0%</td> <td>-3%</td> </tr> </tbody> </table>	Years (i)	2000	2008	2009	2010	2011	- Total all sectors Water Demand (A)	63.31	74.44	76.10	77.84	79.60	- Total all sectors water supply (B)	60.46	70.23	70.03	74	73.8	- WDSI =B/A	0.96	0.94	0.92	0.95	0.93	Rate of increase $R_i WDSI(\%) = (WDSI_i - WDSI_{2000}) / WDSI_{2000}$	0%	-1%	-4%	0%	-3%
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- WDSI =B/A	0.96	0.94	0.92	0.95	0.93																										
Rate of increase $R_i WDSI(\%) = (WDSI_i - WDSI_{2000}) / WDSI_{2000}$	0%	-1%	-4%	0%	-3%																										
	<p>§Sources of verification and Specific comments: - National water Resources Plan Report 2005 - CAPMAS publications</p>																														
<p>2.1. Basin and Transboundary water resources management</p> <p><i>Target:</i> Develop a national Water Efficiency Plan by 2015.</p>	<p>§Specific actions taken so far for the milestone: - Development of the National Water Resources Plan in 2005 ▪Availability of Water Efficiency or IWRM Plan and Year of Adoption: - The National Water Resources Plan (NWRP) for Egypt 2017 published in 2005.</p> <p>Elements of the policy and legal environment: - The main aim of the NWRP is to provide direction and guidelines to all ministries, agencies and institutes working in Egypt's water sector in one form or another, in order to achieve its particular objectives related to water. NWRP objectives are: (1) the supply of drinking water for domestic uses and the provision of sanitation services, according to the government standards and targets, on a cost recovery basis but taking into account the right on basic requirements of all people (2) The supply of water for industrial purposes and the provision of sewage treatment facilities. (3) The supply of water for irrigation based on a participatory approach and cost-recovery of operation and maintenance (4) The protection of the water system from pollution, based on a polluter-pays principle and the restoration of water systems, in particular the ecological valuable areas</p>																														
	<p>Given the importance of water for the socio-economic development of the country, the Government of Egypt is taking all necessary means and measures to manage and develop the water resources of the country in a comprehensive and equitable manner. The NWRP has looked at Investments that are needed to safeguard the water resources and priorities have to be set, Infrastructural projects and improvements of the operation and maintenance of the system are required and the institutional changes that are needed to decentralise and integrate the various activities. Developments in the legal and regulatory environment have to support these changes.</p>																														
	<p>The NWRP has the following pillars (policies): (1) Developing additional new water resources (2) Making better use of existing water resources (3) Protecting health and environment Legal adjustments have been made to develop and implement the measures included in the National Water Resources Plan. Examples are adaptations of Law 48 (1982) to allow the application of the polluters-pay principle and Law 12 (1982) to establish a legal status for the Water boards. Legal adjustment may also be needed to be able to impose fees, issue permits or provide subsidies. On the transboundary aspect, the NWRP also focuses on the cooperation with the Nile basin countries on the development of additional water resources policy. This also monitored through the progress indicators of the NWRP. The MWRI has also the Permanent Joint Technical Commission (PJTC) for Nile Waters and the Joint Authority for studying and development of the Nubian Sandstone Aquifer System that help in managing the two transboundary basins.</p>																														

	<p>Element of the institutional arrangements: -The implementation of the NWRP which is based upon the Integrated Water Resources Management (IWRM) concepts that requires that the roles of the various Ministries are clearly set out, as well as the roles of the difference levels of government. Major institutional developments related to the water sector are decentralisation and privatisation. Steps have been taken into those directions but further implementation requires careful consideration and a strong support of a new institutional setting. The principle of appropriate responsible authority and functions being devolved to the lowest possible level is increasingly being regarded as best practice and most likely to result in a sustainable development. The roles of the different levels of government in relation to allocation of water and provision of permits and the powers of enforcement must be clearly set out. Clarity should also be provided on fiscal and budgetary arrangement and intergovernmental transfers and subsidy schemes.</p>																														
	<p>Element of the financial structure: - One of the principles adopted by the government in the NWRP is that water is a common good and that it cannot be owned by anybody. The basic human and ecological needs should always be satisfied. Agriculture and industry use water to develop commercial products. This means that water has an economic value for them. However, given the important social function of water for employment and income in agriculture and industry, water should not be treated as a normal economic good, ruled by the market mechanism of supply and demand. The social function of water should be taken into account at all times.</p>																														
	<p>Notwithstanding this social function, economic instruments can be used to recover the costs for providing the services involved in supplying the water. Examples are a service fee for agriculture, covering the costs of the operation and maintenance of the irrigation and drainage systems and a drinking water fee for the operation and maintenance costs for the treatment of the water and the distribution systems to the domestic users. In a similar way economic instruments can be used in pollution control. Based on the polluters-pay principle domestic and industrial polluters can be asked to pay a levy on the discharge of waste to the water system. The income generated in this way can be used again to subsidize treatment plants or the use of less polluting production processes.</p>																														
	<p>Management tools: The NWRP has an M&E system that includes approximately 120 indicators to follow up the implementation of the 39 measures of the plan and 15 indicators to assess the impacts. All involved stakeholders have agreed upon those indicators but then they were left to each responsible stakeholder to define how it can be measured. The indicators are updated every 3-6 month and they are collected in paper format. This will change shortly as there is an online system that will be launched and users will be able to access the system to update and view the data.</p> <p>§Sources of verification and Specific comments: -National water Resources Plan Report 2005</p>																														
2.2. not applicable	§Specific actions taken so far for the milestone:																														
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2.4.Rainwater	<p>▪Achievement:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>-Total municipal water supply (A)</td> <td>606</td> <td>8.5</td> <td>9.55</td> <td>9.7</td> </tr> <tr> <td>- Rainwater use (B)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>-Water use from other sources (C)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>-Total municipal water consumption (%) (T_{wc} = A+B+C)</td> <td>6.6</td> <td>8.5</td> <td>9.55</td> <td>9.7</td> </tr> <tr> <td>Percentage of rainwater use p_{Ru}(%)=B/T_{wc}</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>§Sources of verification and Specific comments: - CAPMAS publications - Egyptian Water Regulatory Agency (EWRA) annual reports</p>	Years (i)	2008	2009	2010	2011	-Total municipal water supply (A)	606	8.5	9.55	9.7	- Rainwater use (B)	0	0	0	0	-Water use from other sources (C)	0	0	0	0	-Total municipal water consumption (%) (T _{wc} = A+B+C)	6.6	8.5	9.55	9.7	Percentage of rainwater use p _{Ru} (%)=B/T _{wc}	0	0	0	0
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3.1.Urban Water Supply	<p>§Specific actions taken so far for the milestone: - Reform of the Sector started in 2004 resulting in a significant improvement in the services and coverage.</p>																														

3.2.Urban Sanitation	<p>▪Achievement in water supply:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>-Urban access (%)</td> <td>-----</td> <td>100</td> <td>99.5</td> <td>99</td> <td>99</td> </tr> <tr> <td>-Rural access (%)</td> <td>-----</td> <td>100</td> <td>100</td> <td>100</td> <td>98</td> </tr> <tr> <td>-Total access (%) (W)</td> <td>82.6</td> <td>100</td> <td>99.75</td> <td>99.5</td> <td>98.5</td> </tr> <tr> <td>Rate of Inaccessibility reduction for water IRwat (%) = (Wi-W1990)/(100-W1990)</td> <td>0.00</td> <td>1.00</td> <td>0.99</td> <td>0.97</td> <td>0.91</td> </tr> </tbody> </table>	Years (i)	1990	2008	2009	2010	2011	-Urban access (%)	-----	100	99.5	99	99	-Rural access (%)	-----	100	100	100	98	-Total access (%) (W)	82.6	100	99.75	99.5	98.5	Rate of Inaccessibility reduction for water IRwat (%) = (Wi-W1990)/(100-W1990)	0.00	1.00	0.99	0.97	0.91
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<p>Target: Reduce by 50% from 1990 to 2015, the proportion of the population without improved drinking water source, and the proportion without improved sanitation facility (<i>Urban/Rural /Total</i>).</p>	<p>▪Achievement in improved sanitation:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>-Urban access (%)</td> <td>-----</td> <td>60</td> <td>72.5</td> <td>85</td> <td>99</td> </tr> <tr> <td>-Rural access (%)</td> <td>-----</td> <td>11</td> <td>11</td> <td>11</td> <td>30</td> </tr> <tr> <td>-Total access (%) (W)</td> <td>45</td> <td>36</td> <td>42</td> <td>48</td> <td>59.67</td> </tr> <tr> <td>Rate of Inaccessibility reduction for sanitation IRsan (%) = (Si-S1990)/(100-S1990)</td> <td>0.00</td> <td>-0.17</td> <td>-0.06</td> <td>0.05</td> <td>0.27</td> </tr> </tbody> </table> <p>*Sanitation coverage value was updated in 2011 to cover government supplied coverage as well as NGOs and local efforts. It is estimated that local and NGOs provide nearly 9% of the total coverage. This explains the rapid enhancement in coverage from 2010 to 2011.</p> <p>§Sources of verification and Specific comments: - NWRP indicators - The Holding Company for Water and Wastewater (HCWW) presentations - HCWW & EWRA data - CAPMAS data</p>	Years (i)	1990	2008	2009	2010	2011	-Urban access (%)	-----	60	72.5	85	99	-Rural access (%)	-----	11	11	11	30	-Total access (%) (W)	45	36	42	48	59.67	Rate of Inaccessibility reduction for sanitation IRsan (%) = (Si-S1990)/(100-S1990)	0.00	-0.17	-0.06	0.05	0.27
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<p>4.1.Adaptation to Climate Change</p> <p>Target: Develop and implement, at least 1 Climate Change Adaptation Strategy by 2015.</p>	<p>§Specific actions taken so far for the milestone (<i>New initiatives to improve resilience</i>): - Egypt launched a program called Climate Change Risk Management (CCRM) in 2008. The program aimed at developing a two part strategy to help mitigate the effects of and adapt to climate change. The program is divided into four components, each equipped with relevant government institutions and UN partners, and tasked with the responsibility of implementing either mitigation or adaptation efforts.</p> <p>▪Existence of a National Climate Change Adaptation Strategy and Year of adoption: - The CCRM program has published its Climate Change Strategy in 2013. Part of the strategy deals with the adaptation in the water and irrigation sectors.</p> <p>▪Existence of a Actions Plans on Water for Climate Change resilience: - Action Plans are being formulated.</p>																														
	<p>▪Existence of Programmes for implementing the Actions plans: - None</p> <p>§Sources of verification: - CCRM program reports (http://www.eeaa.gov.eg/English/info/report_CCRMP.asp)</p> <p>§Specific comments: -In Egypt, an action plan exists for Climate Change mitigation. The mitigation action plan focuses on a number of areas including: 1- Environmental Pollution Control 2- Utilizing Nuclear Power and Renewable Energy 3- End-Use Energy Efficiency & Demand-Side Management</p>																														

<p>4.2. Water-related Hazards</p> <p><i>Target:</i> Establish at least 1 Early warning System for disaster prevention at national level by 2015.</p>	<p>§Specific actions taken so far for the milestone (<i>water disaster prevention initiatives</i>):</p> <ul style="list-style-type: none"> - An early warning system is established in Nuweiba City to warn against flash floods <p>▪Existence of Early Warning Disaster prevention System and Year of establishment:</p> <ul style="list-style-type: none"> - The Flash Flood Manager (FlaFloM) project began in 2007 and was completed in 2009. It was coordinated by the Egyptian Water Resources Research Institute (WRRI) and the Belgian consultant company SORESMA together with the Vrije Universiteit of Brussels (VUB). The main result of the project was an accurate flash flood early warning system which can provide the necessary lead-time for local authorities to take emergency actions to minimize the number of victims and limit damage to property.
	<p>Elements on Knowledge of risks:</p> <ul style="list-style-type: none"> - An ideal flash flood detection and early warning system would require water level, discharge and rainfall data collected through real-time field measurements and external forecasts. However, the FlaFloM project, as occurs in many arid flash flood prone areas, was confronted with data scarcity and insufficient knowledge in the flash flood driving forces. To overcome this bottleneck, the project developed rainfall intensity maps derived from two global satellite instruments: the weather research and forecasting model (WRF) and satellite estimates from the Tropical Rainfall Measuring Mission (TRMM).
	<p>Elements on Monitoring, analysis and forecasting of the hazards:</p> <ul style="list-style-type: none"> -The FlaFloM system consists of four modules: 1) a Data gathering module, 2) a Forecasting module, 3) a Decision support module and 4) a Warning module. Each module processes input data and sends the output to the following module. Forecasts have a lead time of up to 48 hours. <p>Elements on Communication or dissemination of alerts and warnings:</p> <ul style="list-style-type: none"> - The FlaFloM is able to send in time a flood warning to the decision-makers in the area In case of a flash flood emergency.
	<p>Elements on Local capabilities to respond to the warnings received:</p> <ul style="list-style-type: none"> -In the Nuweiba City where the FlaFloM early warning system was running, no casualties were reported during the 2010 flash floods. This could indicate good local capabilities to respond to the warnings received by the system. <p>§Sources of verification and Specific comments:</p> <ul style="list-style-type: none"> - http://www.euromedcp.eu/index.php?option=com_customproperties&view=show&task=tag&Itemid=1043&tagId=20&lang=en - http://library.witpress.com/pages/PaperInfo.asp?PaperID=21031 - http://www.preventionweb.net/english/professional/news/v.php?id=12519 - http://www.innovyze.com/news/case_studies/sinai_peninsula.aspx
<p>5.1. Institutional arrangements</p> <p>5.2. Ethics, transparency, empowerment</p> <p>5.3. Public and private roles</p> <p>5.4. Right to water</p> <p>5.5. Regulatory approaches</p>	<p>§Specific actions taken so far for the milestone:</p> <ul style="list-style-type: none"> - Establishment of the Institutional Reform Unit (IRU) at MWRI in 2002 - Water and Wastewater sector reform in 2004 - Development of the National Water Resources Plan in 2005 <p>▪Existence of Water sector policy that reflects good governance principles, and Year of latest update:</p> <ul style="list-style-type: none"> - See section 2.1 above.

<p>Target: Institute/update, by 2015, water sector policy reforms that reflect good governance principles of: (i) partnership commitment; (ii) ethics -transparency,</p>	<p>Elements on Partnership and commitment: In May 2005, the Institutional Reform Unit (IRU) prepared the guiding document “Vision and Strategy for MWRI Institutional Reform”, which reiterated the challenges in the water sector that call for new approaches to water management in Egypt. Whereas the IRU Vision and Strategy recognised that efficiency gains and equity improvements could be made through the application of information systems, technology and communication, it stressed that 21st century water management also requires fundamental institutional reform, i.e. a change in the distribution of responsibility and authority among stakeholders. As with the NWRP, the Vision and Strategy maintained that the modern water resources management challenges could mainly be met by “a greater involvement of water end-users and an increasingly multi-sector approach to water resources planning and control”. The Strategy as developed was guided by a number of principles such as decentralisation, participation and inter-ministerial coordination which can be applied in different degrees and combinations to Egypt’s water management system.</p>
<p>equity and fairness; (iii) responsibility and accountability; (iv) inclusiveness, participation, predictability and responsiveness; and (v) coherence.</p>	<p>Elements on Ethics - transparency, equity and fairness: Within the Vision and Strategy for MWRI Institutional Reform described above, the concept of participation includes enhancing of the openness, accountability and transparency of transactions. However, it is recognised that this process requires time to be fully developed.</p> <p>Elements on Responsibility and accountability: A transfer of responsibilities to end-user organisations (see section below) necessarily requires the corresponding adaptation of the roles, responsibilities and mode of operation of the government agencies at local, district and governorate levels, as is reflected in the shared vision of decentralisation, the horizontal integration of MWRI administrations and multi-sector cooperation for the implementation of IWRM.</p>
	<p>Equally shared is the vision that adaptations to the legal framework are required in order to achieve the reforms, particularly to enable the effective functioning of the water users’ organisations as partners in water management. The IRU’s Vision and Strategy sets out the following requirements:</p> <ul style="list-style-type: none"> - The proposed reorganization of MWRI entities at the District and General Directorate levels can be established by Ministerial decrees. - The changes at the regional and national level will require the approval of Central Authority of Organization and Administration - A Presidential Decree is required for the reorganization of the Ministry. - Three draft amendments to Law 12/1984 are both necessary and sufficient to constitute the Directorate Boards, District Boards, and Branch Canal Boards as corporate entities. The executive
	<p>regulations of the amended Law 12 will be critical for setting out:</p> <ol style="list-style-type: none"> 1 the legal rights and responsibilities of water boards 2 the framework for water board membership, governance, management, accounting, financial management, and setting of charges and penalties 3 the framework of transfer agreements, including levels of management transfer, preconditions for “graduation” to each level, and mechanisms and procedures for MWRI monitoring and regulation
	<p>Elements on Inclusiveness, participation, predictability and responsiveness: Within the Vision and Strategy for MWRI Institutional Reform described above, the following two-phased reform process was proposed: First stage:</p> <ol style="list-style-type: none"> a) Formation of water users’ organizations (WUOs) at branch canal, district, and directorate levels to propose water distribution plans and participate in O&M activities, resolve internal conflicts, and assume responsibility for selected O&M costs b) Horizontal integration of MWRI administrations at district, directorate, and regional levels c) Increased private sector participation in O&M d) Formation of the National Water Council
	<p>Second stage:</p> <ol style="list-style-type: none"> a) Transfer of O&M management and financial responsibilities to WUOs b) Restructuring of MWRI local administrations into Regional Water Management Authorities of the public service authority type, with inter-ministerial boards of directors c) Increased private sector participation in financing and operation of large I&D works. <p>The above focuses on the end-user participation which remains firmly at the foundation of the policies for reform, with the shared vision of the gradual – or phased – transfer of responsibilities, authority and control to water users’ organisations at mesqa, branch canal, and governorate level.</p>

	<p><u>Elements on Coherence:</u> - See section 2.1 above.</p> <p>§Sources of verification and Specific comments: - National water Resources Plan Report 2005 - NWRP Technical Report No. 70 Strengthening the Participatory Approach in Irrigation Management</p>																				
<p>6.1.Financing Local Authorities</p> <p><u>Targets:</u> - Allocate immediately at least 0.5 % of GDP to sanitation & hygiene.</p>	<p>§Specific actions taken so far for the milestone: - First target was almost achieved in 2009.</p> <p>▪Achievement for GDP allocation:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>- GDP (A₁) 10⁶ LE</td> <td>855302</td> <td>994055</td> <td>1150620</td> <td>1309905</td> </tr> <tr> <td>- Sanitation and Hygiene Budget (B₁)</td> <td>3600</td> <td>4800</td> <td>4300</td> <td>2900</td> </tr> <tr> <td>Percentage of GDP to Sanitation and Hygiene gdpSH (%) = B1/A1</td> <td>0.42%</td> <td>0.48%</td> <td>0.37%</td> <td>0.22%</td> </tr> </tbody> </table>	Years (i)	2008	2009	2010	2011	- GDP (A ₁) 10 ⁶ LE	855302	994055	1150620	1309905	- Sanitation and Hygiene Budget (B ₁)	3600	4800	4300	2900	Percentage of GDP to Sanitation and Hygiene gdpSH (%) = B1/A1	0.42%	0.48%	0.37%	0.22%
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	<p><u>Tariff for rural areas if any:</u> - NA</p> <p>▪Describe the sanitation services pricing if there is any: - Tariff is 40% of the domestic use water tariff and 75% of the water tariff for other uses</p> <p>§Sources of verification and Specific comments: - HCWW data</p>																				

<p>7.1. Education and capacity development</p> <p><i>Target:</i> To be identified.</p>	<p>§Not be reported.</p>															
<p>7.2. Information</p> <p><i>Target:</i> Enhance by 2016, the national water and sanitation Monitoring, Evaluation and Reporting (M&E, &R) Systems in a way to be in line with the pan African M&E.</p>	<p>- The Monitoring Analysis and Reporting System (MARS) is used for the monitoring and Evaluation of the performance of the companies that are under the HCWW. The system at the beginning was used to collect the laboratory results of the water samples and was extended with time to be an online system that covers the following aspects:</p> <ol style="list-style-type: none"> 1. Water quality parameters 2. Performance Indicators 3. Financial and Economic Analyses <p>Based upon the system results and reports, recommendations are made to improve the services provided by HCWW.</p> <p><u>Recent updates in the M&E System:</u></p> <table border="1"> <thead> <tr> <th>Items</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>-New Elements incorporated</td> <td></td> <td></td> <td></td> <td>System is already established</td> </tr> <tr> <td>-Drivers</td> <td></td> <td></td> <td></td> <td>System is already established</td> </tr> </tbody> </table>	Items	Year 1	Year 2	Year 3	2011	-New Elements incorporated				System is already established	-Drivers				System is already established
Items	Year 1	Year 2	Year 3	2011												
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-Drivers				System is already established												
	<p><u>Elements of the pan African M&E incorporated:</u></p> <ul style="list-style-type: none"> - Not yet but is part of the Monitoring and Evaluation of for Water in North Africa (MEWINA) project. <p>§Sources of verification and Specific comments:</p> <ul style="list-style-type: none"> - MEWINA project reports 															
<p>7.3. Water and Technologies</p> <p><i>Target:</i> To be identified.</p>	<p>§Not be reported.</p>															
<p>7.4. Professional Networks/ Associations</p> <p><i>Target:</i> To be identified.</p>	<p>§Not be reported.</p>															

Libya AMCOW Pan African M&E Performance Sheet

Country Background Information Sheet

Country Name: **Libya**

Items	Information																																								
1. Population trends for the last 4 years, and GDP.	<table border="1"> <thead> <tr> <th>Years</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>Urban pop.</td> <td>4399287</td> <td>5258044</td> <td>5374446</td> <td>5490302</td> <td>5611689</td> <td>5735675</td> <td>5859104</td> </tr> <tr> <td>Rural pop.</td> <td>716163</td> <td>607036</td> <td>597161</td> <td>589767</td> <td>578812</td> <td>567265</td> <td>558315</td> </tr> <tr> <td>*Total pop.</td> <td>5115450</td> <td>5865079</td> <td>5971607</td> <td>6080069</td> <td>6190501</td> <td>6302939</td> <td>6417419</td> </tr> <tr> <td>GDP (Billion USD)</td> <td>34.3</td> <td>39.71</td> <td>63.1</td> <td>74.8</td> <td>34.7</td> <td>73.8</td> <td>73.6</td> </tr> </tbody> </table> <p>*Last census was conducted in 2006. Values are estimates. Values are for Libyans only. Non-Libyans accounts for about 6.5% of the population (2007 Statistics year book)</p>	Years	2000	2008	2009	2010	2011	2012	2013	Urban pop.	4399287	5258044	5374446	5490302	5611689	5735675	5859104	Rural pop.	716163	607036	597161	589767	578812	567265	558315	*Total pop.	5115450	5865079	5971607	6080069	6190501	6302939	6417419	GDP (Billion USD)	34.3	39.71	63.1	74.8	34.7	73.8	73.6
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2. Basis of the existing water sector Policy/ Reform and potential policy targets.	<p><i>Important issues addressed in the existing Water Sector Reform?</i></p> <ul style="list-style-type: none"> - Bridging water demand / supply deficit. - Excessive groundwater mining. - Seawater intrusion and water quality deterioration. - Improving domestic water supply and sanitation access. - Review and redirection of irrigated agricultural policies. - Institutional capacity building. - Integrated water resources management. - Uncontrolled groundwater mining - Low Water Tariffs and Poor Recovery Rates 																																								
3. Knowledge of international and African Milestones on Water and Sanitation.	<p><i>Which are the ones well known and used in the county? Specify how it is used.</i></p> <ul style="list-style-type: none"> - Agenda 21-Rio principles: as a general guide for sustainable use of water for development. - The Dublin principles: as a general guide for sustainable use of water for development. - UN Millennium Development Goals (MDGs): as a measure of progress towards achieving MDGs. - African Water Vision 2025: as a base for updating plans and as a measure of progress. - Sharm-el-Sheikh Declaration: as a base for updating plans to accelerate meeting water supply and sanitation goals. 																																								
4. Trend of the 3 latest reviews in national water Policy and Reforms.	<table border="1"> <thead> <tr> <th>Years</th> <th>2008</th> <th>2009</th> <th>2010</th> </tr> </thead> <tbody> <tr> <td>Drivers of the Reviews</td> <td>Reducing increasing water deficits Decreasing water quality decline Improving service levels</td> <td>Reducing increasing water deficits Decreasing water quality decline Improving service levels</td> <td>Reducing increasing water deficits Decreasing water quality decline Improving service levels</td> </tr> <tr> <td>Targeted Impacts and effectiveness</td> <td>Decreasing deficits Improving quality Improving services</td> <td>Decreasing deficits Improving quality Improving services</td> <td>Decreasing deficits Improving quality Improving services</td> </tr> </tbody> </table>	Years	2008	2009	2010	Drivers of the Reviews	Reducing increasing water deficits Decreasing water quality decline Improving service levels	Reducing increasing water deficits Decreasing water quality decline Improving service levels	Reducing increasing water deficits Decreasing water quality decline Improving service levels	Targeted Impacts and effectiveness	Decreasing deficits Improving quality Improving services	Decreasing deficits Improving quality Improving services	Decreasing deficits Improving quality Improving services																												
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5. Comments on the national water sector regarding the strengths, weaknesses, opportunities, threats and outstanding problems.

- Strengths: a) a national water strategy exists, b) a ministry for water resources has been established, c) strong official commitment to the water sector, d) specialized institutions for water supply and distribution exist, e) skilled workforce exists, f) financing is available with many major projects under execution, g) rising water awareness, h) favorable political climate.

- Weaknesses: a) weak governance and institutional capacities, b) lack of data and information, c) weak monitoring, evaluation, and enforcement, d) socio-cultural factors, e) geographic and demographic factors (large area and low population density), f) poor inter sectoral coordination.

- Opportunities: a) easy access to international experience and technological advancements, b) more stakeholder participation and private sector involvement, c) favorable oil prices, d) favorable climate for international investments, e) availability of water technologies.

- Threats: a) water scarcity and quality degradation, b) multiplicity of transboundary basins, c) climate change and desertification, d) political instability, e) food sufficiency syndrome.

- Outstanding problems: a) continuing deficit, b) low standard of service, c) inefficiency of utilization, d) water pricing and financing, e) lack of data and information, f) lack of a national framework for water planning, M&E.

Country Water and Sanitation Performances Evaluation Sheet

Country Name: **Libya**

Performance Category	Country Information																																																
PC. 1.1. Water & Energy	This category does not apply to Libya																																																
PC. 1.2. Water and Agriculture <i>Targets:</i> -Increase water productivity Rain fed agriculture & Irrigation by 30% from 2000 to 2015.	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ul style="list-style-type: none"> ○ The initiation of a water harvesting programme. ○ Construction of new dams and maintenance of one “damaged” old dam. ○ Local manufacturing of drip irrigation systems and their adaptation by farmers. ○ Mapping and soil classification studies with special reference to rainfed agriculture areas. ○ Construction of rain water collection reservoirs and water retaining structures on Wadis by government and private sector. 																																																
and -Increase the size of irrigated areas by 50% from 2000 to 2015	<ul style="list-style-type: none"> ▪ Achievement on water productivity: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>Agricultural GDP (Billion USD) (A)</td> <td>0.74</td> <td>0.98</td> <td>1.56</td> <td>1.09</td> <td>0.69</td> <td>1.48</td> <td>1.47</td> </tr> <tr> <td>Total Agri. Water withdrawal (Billion m3)(B)</td> <td>4.23</td> <td>4.95</td> <td>5.04</td> <td>5.13</td> <td>5.22</td> <td>5.31</td> <td>6.06</td> </tr> <tr> <td>-Water Return to Environment (C)</td> <td>0.2**</td> <td>0.2</td> <td>0.2</td> <td>0.2</td> <td>0.2</td> <td>0.2</td> <td>0.2</td> </tr> <tr> <td>Water productivity (USD/m3) Wp=A/(B-C)</td> <td>0.18</td> <td>0.21</td> <td>0.32</td> <td>0.22</td> <td>0.14</td> <td>0.29</td> <td>0.25</td> </tr> <tr> <td>Rate of increase RiWp(%) = (Wpi-Wp2000)/Wp2000</td> <td>12.26</td> <td>75.06</td> <td>19.94</td> <td>-25.15</td> <td>56.39</td> <td>36.06</td> <td>xxxx</td> </tr> </tbody> </table> <p>*NA = not available **Estimated</p> 	Years (i)	2000	2008	2009	2010	2011	2012	2013	Agricultural GDP (Billion USD) (A)	0.74	0.98	1.56	1.09	0.69	1.48	1.47	Total Agri. Water withdrawal (Billion m3)(B)	4.23	4.95	5.04	5.13	5.22	5.31	6.06	-Water Return to Environment (C)	0.2**	0.2	0.2	0.2	0.2	0.2	0.2	Water productivity (USD/m3) Wp=A/(B-C)	0.18	0.21	0.32	0.22	0.14	0.29	0.25	Rate of increase RiWp(%) = (Wpi-Wp2000)/Wp2000	12.26	75.06	19.94	-25.15	56.39	36.06	xxxx
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	<ul style="list-style-type: none"> ▪ Specific comments: <ul style="list-style-type: none"> ○ Increase in water productivity from rain-fed agriculture is very difficult to estimate or verify as: 1) no data are collected on rain-fed agricultural production, 2) solely rain-fed agriculture is limited geographically and plays a minor role in agricultural production, and, 4) rain-fed agriculture is almost always complemented with irrigation in major agriculture areas. An increase is very likely, however, due to actions taken officially and privately to harvest rain water as described in milestones listed above. The increase, although real, is difficult to quantify, however. ○ Water productivity of irrigated agriculture has probably increased due to the rapid increase in drip irrigation systems recently coupled with improvements in traditional irrigation practices. This increase may have also been forced by the water scarcity problem which is spreading rapidly in the Gefara plane, the bread basket of Libya. The increase is difficult to quantify, however, with no data collected especially from the private sector which is the major agricultural producer. 																																																

Performance Category	Country Information																																																
	<ul style="list-style-type: none"> ○ Increase of irrigated land by private sector especially on large scales (pivot irrigation) in south-western Libya. However, in other areas of Libya, the increase in irrigated land areas is very small for several reasons; firstly, water has become limiting in many areas of “traditionally irrigated” areas. Secondly, many of the large scale government administered “public projects” have suffered neglect and deterioration (of wells, equipment, etc.) resulting in a decrease in irrigated areas. Finally, encroachment of urbanization has been at the expense of irrigated areas. 																																																
	<ul style="list-style-type: none"> ○ On the other hand, new “virgin” lands are being turned into farms by private farmers despite the severe lack of arable land and scarce water resources, a trend that is likely to continue as water and power costs are still very low encouraging large scale farming especially in the south west region of Libya. ○ On the whole, it is safe to assume that there is an increase in irrigated areas and an improvement in irrigation efficiency, but they are below the set target. ○ In the case of Libya, expansion of irrigated areas is not possible and should not be planned due to severe limitations on arable land and, more importantly, on water and to the adverse social, economic and environmental impacts of continuing these practices. Improvement in irrigated water efficiency and other aspects of agricultural production management should be among the Libya’s water policy reform priorities. ○ This target is not realistic for Libya and will not be achieved. 																																																
<p>PC. 1.3. Water for multiple Uses</p> <p><i>Target:</i> Increase the Water Demand Satisfaction Index (WDSI) by 10% from 2000 to 2015.</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ul style="list-style-type: none"> ○ Increase water supply sources through completion of the Manmade River Project. ○ Increase water supply through desalination but quantities were very limited as plant construction takes time. Desalination capacities should increase notably in near future. ○ Increase quantities of treated effluents through execution and rehabilitation of many wastewater treatment facilities which should go into operation in the near future. ○ Increase harvested rainfall through construction and rehabilitation of many dams. 																																																
	<ul style="list-style-type: none"> ▪ Achievement: <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- Total all sectors</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Water Demand (A)</td> <td>4829</td> <td>5646</td> <td>5748</td> <td>5851</td> <td>5954</td> <td>6058</td> <td>4450</td> </tr> <tr> <td>Total all sectors Water supply (B)</td> <td>4450</td> <td>4450</td> <td>4450</td> <td>4450</td> <td>4450</td> <td>4450</td> <td>4451</td> </tr> <tr> <td>- WDSI =B/A</td> <td>0.922</td> <td>0.788</td> <td>0.774</td> <td>0.761</td> <td>0.747</td> <td>0.735</td> <td>1.000</td> </tr> <tr> <td>Rate of increase RiWDSI(%) = (WDSIi -WDSI2000)/ WDSI2000)</td> <td>-14.5</td> <td>-16.0</td> <td>-17.5</td> <td>-18.9</td> <td>-20.3</td> <td>8.5</td> <td>xxxx</td> </tr> </tbody> </table> 	Years (i)	2000	2008	2009	2010	2011	2012	2013	- Total all sectors								Water Demand (A)	4829	5646	5748	5851	5954	6058	4450	Total all sectors Water supply (B)	4450	4450	4450	4450	4450	4450	4451	- WDSI =B/A	0.922	0.788	0.774	0.761	0.747	0.735	1.000	Rate of increase RiWDSI(%) = (WDSIi -WDSI2000)/ WDSI2000)	-14.5	-16.0	-17.5	-18.9	-20.3	8.5	xxxx
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	<ul style="list-style-type: none"> ▪ Sources of verification Ministry of water resources, Public Company for Desalination, and Ministry of Agriculture and Animal Wealth reports. 																																																
	<ul style="list-style-type: none"> ▪ Specific comments: <ul style="list-style-type: none"> ○ Contributions of desalination and effluent reuse were ignored in calculations above as they were insignificant in the specified period (2000-2011). ○ RiWDSI is decreasing with time signaling a serious deficit that must be addressed urgently. The trend should be reversed if sustainable development is to be realized. ○ The major user of water is agriculture which consumes about 85 % of the total water supplied. Any remedies (efforts to reverse the situation) must start with and focus on agriculture and food production policies. Another measure will be to address inefficiencies in irrigation practices and introduce improvements through improving efficiency and not expanding horizontally by increasing areas cultivated. ○ Uncontrolled groundwater mining that is not monitored is expected to account for the imbalance between water supply and demand. 																																																

Performance Category	Country Information
	<ul style="list-style-type: none"> ○ The 1000 m3/capita/yr that is used by the indicator might not be reasonable for Libya. ○ Lack of data is masking the agricultural malpractices along with the “food sufficiency syndrome” which dominates the agricultural strategies and plans of many developing countries including Libya. ○ The agricultural work force is mostly “non-Libyan” and lacks basic skills relying mostly on outdated practices. ○ Agricultural sector suffers many serious weaknesses and faces severe threats especially environmental ones including arid climate, climate change, desertification, and water scarcity. ○ The total sector water supply will increase with the increase in productivities of the Manmade River Project, desalination plants, treated effluent, and harvested rainwater. If projects are executed as planned, it will be very likely that the set target will be reached. ○ None-the-less, the deficiency should be taken seriously and used as a base for urgent water policy decisions and actions!
<p>PC. 2.1. Basin and Transboundary water resources management</p> <p><i>Target:</i> Develop a national Water Efficiency Plan by 2015.</p>	<p>ON THE NATIONAL LEVEL</p> <ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ul style="list-style-type: none"> ○ Establishment of the Ministry of Water Resources as an independent organ responsible for the management of water resources on a national level. ○ Preparation of the National Strategy for Water Resources Management (2000 – 2025) and endorsement of this strategy in 2006. ○ Division of Libya into Water Regions and management of each region semi-independently. ○ Establishment of dedicated ministries for the major water using sectors, namely, agriculture, industry, and housing and utilities. ○ Establishment of independent auditing bodies for technical, administrative, and financial performance of the ministries. ○ Establishment of a committee on the level of the National Congress in charge of follow up of infrastructures plans progress. ○ Establishment of the General Environment Authority to oversee the water resources management and monitor resource utilization and quality changes.
	<ul style="list-style-type: none"> ▪ Availability of Water Efficiency or IWRM Plan and Year of Adoption: There is a National Strategy for Integrated Water Resources Management and annual sector plans. This strategy, although officially adopted in 2006, has not been operationalized yet. However, it has been followed by the water sector organs as a generated basis / guide for action plans. Many of its recommendations have been implemented.
	<p>Elements of the policy and legal environment:</p> <ul style="list-style-type: none"> ○ Water Law (2) / 1982 and Environment Protection and Enhancement Law (15)/ 2006 are in place along with several decrees. ○ The National Strategy for Integrated Water Resources Management (2000 – 2025). ○ Water pollution control and water quality standards are in place. ○ Existing policies and annual plans on level of ministries concerned with water supply and utilization. ○ Regional and international guidelines and targets are considered in policy formulation and execution. ○ All water concerned ministries are in the process of preparing sectoral strategies which must include action plans rather than annual plans.
	<p>Elements of the institutional arrangements:</p> <ul style="list-style-type: none"> ○ A special ministry for water resources (MoWRs) was established in Nov. 2012. ○ The General Water Authority, an organ affiliated with the MoWRs, has been in service for over two decades with capacities and experience in water resources management. ○ Several organs specialized in water supply, transportation, and distribution have been established. These organs are semi-autonomous with sufficient human and financial resources. <p>Elements of the financial structure:</p> <ul style="list-style-type: none"> ○ Budgets are allocated annually for water sector organizations. <p>Expenditure auditing is practiced on all sectors including water.</p>

Performance Category	Country Information
	<p><u>Management tools:</u></p> <ul style="list-style-type: none"> ○ Sectoral plans are available for evaluation and follow-up. ○ Regional and international guidelines for M&E&R are available. ○ M&E systems are in place in the water sector organs although at different levels of advancement. However, a national M&E system is not in place yet. ○ M&E systems are in place in the Environment General Authority but capacities to apply them are
	<ul style="list-style-type: none"> ○ limited. ○ Research centers, academic institutions, and private consulting offices and laboratories are available to assist in the E&M processes. ○ Civil society organizations (NGOs) are emerging with a powerful role in monitoring and overseeing environment and water issues.
	<ul style="list-style-type: none"> ▪ Sources of verification: <ul style="list-style-type: none"> ○ Ministry of Water Resources ○ General Water Authority ○ Manmade River Execution and Management Authority ○ Environment General Authority
	<ul style="list-style-type: none"> ▪ Specific comments: <ul style="list-style-type: none"> ○ M&E systems are not present in major water consuming sectors such as agriculture and industry. ○ Enforcement mechanisms are very weak. ○ Request of information and data is limited so M&E systems are driven mostly in response to specific organizations initiatives. ○ A national framework on M&E does not exist so the nature of data collected and levels of analysis and outputs are not comparable. Hence, data collected are of limited use. <p>Please refer to section on Observations and Comments at the end of this report for more comments.</p>
	<p><u>ON THE LEVEL OF TRANSBOUNDARY BASINS</u></p> <ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ol style="list-style-type: none"> 1. Establishment of the Joint Authority for the Study and Management of the Nubian Sandstone Aquifer System (JASMNSSAS) with headquarters in Tripoli, Libya. This JA has accomplished the following major tasks:
	<ul style="list-style-type: none"> ○ Building capacities for the management of the aquifer. ○ Generation of valuable data on the NSSA and modeling. ○ Establishment of a regional database and monitoring system. ○ Preparation of several technical reports. ○ Organization of a conference on shared aquifers. <ol style="list-style-type: none"> 2. Establishment of the Sahara and Sahel Observatory for the Northwestern Sahara Aquifer System (NWSAS). This organization has accomplished the following major tasks: <ul style="list-style-type: none"> ○ Conducting of the first phase of the NWSAS project (1999 – 2002): information system, modeling, and consultative mechanisms. ○ Preparation of several reports technical reports.
	<ul style="list-style-type: none"> ▪ Target Indicator: Availability of Water Efficiency or IWRM Plan and Year of Adoption <p>There is no Water Efficiency or IWRM Plan presently on the level of the Transboundary water resources management.</p> <p><u>Elements of the policy and legal environment:</u></p> <ul style="list-style-type: none"> ○ Memoranda of understanding have been signed between sharing partners. ○ International agreements / conventions have been consulted. ○ International help is available / has been offered. ○ An agreement exists regarding the NSSAS exploitation with quantity and quality monitoring and data collection and exchange.

Performance Category	Country Information
	<p><u>Element of the institutional arrangements:</u></p> <ul style="list-style-type: none"> ○ Bodies for management of the basins have been formulated with clear mandates. ○ Capacities for execution of plans have been provided in the form of office buildings, manpower, equipment, etc. ○ Database management systems are in place (SAP and SADA) ○ CEDARE is the base for annual data collection and analysis. ○ For NWSAS, a technical level Administerial Mechanism was formulated in 2002 along with an Operation Structure (2008) and a Consulting Mechanism (2007). ○ Official bodies have been undertaking their responsibilities successfully. ○ Practical experience (technical, legal, financial, and administrative) has been gained.
	<p><u>Element of the financial structure:</u></p> <ul style="list-style-type: none"> ○ Financial structures with basic financing mechanisms have been put in place for several years. ○ Budgets have been approved and money forwarded by the member states for the NSSAS. ○ Financial assistance from member states, African, European and UN organizations has been available. <p><u>Management tools:</u></p> <ul style="list-style-type: none"> ○ Basic monitoring and reporting mechanisms agreed to and implemented. ○ Specialized bodies formed for the shared aquifers management. ○ Minutes of understanding between partners. ○ Joint committees with consultation mechanisms. ○ Engagement of technical consultative bodies (CEDARE). <p>▪ Sources of verification:</p> <ul style="list-style-type: none"> ○ JQSMNSSAS, Tripoli, Libya ○ NWSAS, Tunis, Tunisia
	<ul style="list-style-type: none"> ▪ Specific comments: ▪ Shared aquifers management policies and plans are still in evolutionary stages. ▪ A solid database is being built and data are utilized. ▪ Models have been constructed and implemented. ▪ Memoranda of Understanding have been signed. ▪ Evaluation and monitoring are underway. ▪ Mechanisms for consultation are underway. ▪ Other aspects of management are being developed. ▪ A comprehensive regional water resources management plan will only be possible once all aspects of basin development are completed. ▪ In summary, a satisfactory level of progress has been made with practical results that are essential for sustainable utilization of shared basins. ▪ Progress has been steady and is expected to reach targets easily.
PC. 2.2. Transboundary	<ul style="list-style-type: none"> ▪ Not applicable
PC. 2.3. Groundwater	<ul style="list-style-type: none"> ▪ Not applicable

Performance Category	Country Information																																										
<p>PC. 2.4. Rainwater <i>Target:</i> Increase the share of rainwater use in total municipal water consumption up to 10% by 2015.</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ul style="list-style-type: none"> -A national programme on rainwater harvesting has been initiated. New dams are under construction along with reservoirs for collection of rainwater. - The ministry of agriculture has financed private collection reservoirs. - Rainwater has been traditionally harvested by a very small number of people for domestic purposes. The amount harvested is negligible, however. ▪ Achievement: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Total municipal water supply (A)</td> <td>0.57</td> <td>0.585</td> <td>0.6</td> <td>0.614</td> <td>0.629</td> <td>0.643</td> </tr> <tr> <td>- Rainwater use (B)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>-Water use from other sources (C)</td> <td>0.57</td> <td>0.585</td> <td>0.6</td> <td>0.614</td> <td>0.629</td> <td>0.629</td> </tr> <tr> <td>Total municipal water consumption Twc = (A+B+C)</td> <td>1.14</td> <td>1.17</td> <td>1.2</td> <td>1.228</td> <td>1.258</td> <td>1.27231</td> </tr> <tr> <td>Percentage of rainwater use pRu(%)= B/Twc</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>*No data are available, but the amounts harvested are negligible relative to the total municipal demand.</p> 	Years (i)	2008	2009	2010	2011	2012	2013	-Total municipal water supply (A)	0.57	0.585	0.6	0.614	0.629	0.643	- Rainwater use (B)	0	0	0	0	0	0	-Water use from other sources (C)	0.57	0.585	0.6	0.614	0.629	0.629	Total municipal water consumption Twc = (A+B+C)	1.14	1.17	1.2	1.228	1.258	1.27231	Percentage of rainwater use pRu(%)= B/Twc	0	0	0	0	0	0
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	<ul style="list-style-type: none"> ▪ Sources of verification: <ul style="list-style-type: none"> ○ General Company for Water and Wastewater ○ Ministry of Housing and Utilities reports ○ Ministry of Agriculture ▪ Specific comments: <ul style="list-style-type: none"> ○ Therefore, <u>this target has not been achieved</u> because rainfall is sporadic and collectable amounts are very low in most cases so people rely heavily on piped water or on transported water. ○ The realization of this objective is possible, however, if special efforts are made to encourage people in water short regions to collect water. This should be a major component of the Ministry of Agriculture's "Water Harvesting Program" under way currently. A major obstacle will be that major water supply schemes are under construction and, when completed, practically all Libyans living in urban areas will have piped water. 																																										
<p>PC. 3.1. Urban Water Supply</p> <p>PC. 3.2. Urban Sanitation</p> <p>PC. 3.3. Rural Water Supply</p> <p>PC. 3.3. Rural Sanitation and Hygiene</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ul style="list-style-type: none"> ○ Establishment of the National Programme for Water and Wastewater (NPWWw) intended to identify all urban communities, towns, and cities in need of WSS systems or whose existing systems need to be expanded or upgraded. ○ As part of the NPWWw, WSS systems were designed for all "urban" communities, towns, and cities of Libya. ○ Establishment of the Development Programme 2008 – 2012, a comprehensive national programme with a special focus on housing and infrastructures. The programme implementation costs were estimated at 100 billion Libyan dinars (US \$ 80 billion); about 15 billion Libyan dinars are allocated to infrastructures. The programme projects are in line with the NPWWw. ○ Establishment of public service companies, namely, the General Company for Water and Wastewater for operation and maintenance of WSS systems and the General Company for Desalination for supplying desalinated water. ○ Establishment of the Manmade River Authority in charge of execution and management of the Manmade River Project. The project is nearing completion and will supply water for all purposes including domestic uses. The Project has been supplying Libya's major coastal cities with water for over 20 years. Over 50 % of domestic water supplies in 2012 were from the Manmade River Project. ○ National drinking and effluent standards have been promulgated. ○ Establishment of the Ministry of Water Supplies in Nov. 2012 with authority to oversee the water sector in Libya. 																																										

Performance Category	Country Information																																								
	<p>▪ Achievement in water supply:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Urban access (%)</td> <td>72</td> <td>92</td> <td>93</td> <td>94</td> <td>94</td> <td>94</td> <td>94</td> </tr> <tr> <td>-Rural access (%)</td> <td>68</td> <td>80</td> <td>82</td> <td>84</td> <td>84</td> <td>84</td> <td>84</td> </tr> <tr> <td>-Total access (%) (W)</td> <td>71</td> <td>89</td> <td>91</td> <td>92</td> <td>92</td> <td>92</td> <td>92</td> </tr> <tr> <td>Rate of Inaccessibility reduction for water IRwat (%) = (Wi-W1990)/(100-W1990)</td> <td>0</td> <td>62</td> <td>69</td> <td>72</td> <td>72</td> <td>72</td> <td>xxxx</td> </tr> </tbody> </table>	Years (i)	1990	2008	2009	2010	2011	2012	2013	-Urban access (%)	72	92	93	94	94	94	94	-Rural access (%)	68	80	82	84	84	84	84	-Total access (%) (W)	71	89	91	92	92	92	92	Rate of Inaccessibility reduction for water IRwat (%) = (Wi-W1990)/(100-W1990)	0	62	69	72	72	72	xxxx
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<p><i>Target:</i> Reduce by 50% from 1990 to 2015, the proportion of the population without improved drinking water source, and the proportion without improved sanitation facility (Urban/Rural / Total).</p>	<p>▪ Achievement in improved sanitation:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Urban access (%)</td> <td>84</td> <td>94</td> <td>94</td> <td>96</td> <td>99</td> <td>99</td> <td>99</td> </tr> <tr> <td>-Rural access (%)</td> <td>85</td> <td>95</td> <td>96</td> <td>96</td> <td>97</td> <td>97</td> <td>97</td> </tr> <tr> <td>-Total access (%) (S)</td> <td>84</td> <td>94</td> <td>94</td> <td>96</td> <td>98.8</td> <td>98.8</td> <td>98.8</td> </tr> <tr> <td>Rate of Inaccessibility reduction for sanitation IRsan (%) = (Si-S1990)/(100-S1990)</td> <td>0</td> <td>62.5</td> <td>62.5</td> <td>75</td> <td>92.5</td> <td>92.5</td> <td>xxxx</td> </tr> </tbody> </table> <p>▪ Sources of verification</p> <ul style="list-style-type: none"> ○ General Company for Water and Wastewater Reports. ○ CEDARE, MDGs Achievement Status in the Arab Region. ○ WHO / UNICEF Joint Monitoring Programme for Water Supply and Sanitation Report, 2008. 	Years (i)	1990	2008	2009	2010	2011	2012	2013	-Urban access (%)	84	94	94	96	99	99	99	-Rural access (%)	85	95	96	96	97	97	97	-Total access (%) (S)	84	94	94	96	98.8	98.8	98.8	Rate of Inaccessibility reduction for sanitation IRsan (%) = (Si-S1990)/(100-S1990)	0	62.5	62.5	75	92.5	92.5	xxxx
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	<p>▪ Specific comments:</p> <ul style="list-style-type: none"> ○ <u>Libya has exceeded the MDGs targets</u> in reducing inaccessibility to safe water supply and sanitation and hygiene in urban areas. ○ <u>Libya has exceeded the MDGs targets</u> in reducing inaccessibility to safe water supply and sanitation and hygiene in rural areas. ○ Libya has exceeded the MDGs targets in reducing inaccessibility to safe water supply and sanitation and hygiene nationally, i.e., in urban and rural areas. ○ Access and coverage rates higher than those presented above have been cited in some references mainly those of the UN organizations. 																																								
<p>PC. 4.1. Adaptation to Climate Change</p> <p><i>Target:</i> Develop and implement, at least 1 Climate Change Adaptation Strategy by 2015.</p>	<p>▪ Specific actions taken so far for the milestone (<i>New initiatives to improve resilience</i>):</p> <ul style="list-style-type: none"> ○ The National Committee for Climate Change (CC) has been formed; it is headed by the Environment General Authority with members from 14 concerned ministries and institutions. The Ministry of Water Resources is a member in this Committee. ○ A National Project for Studies of Climate Change has been started by the National Authority for Scientific Research to study and research the phenomenon and its impacts on Libya. ○ Libya has endorsed / ratified all CC conventions and participated in most Climate Change Panel Meetings. ○ Several studies have been conducted on climate change and its impacts on parts of Libya. ○ However, the overall institutional framework is still weak and little concrete results have been obtained. <p>▪ Existence of a National Climate Change Adaptation Strategy and Year of adoption:</p> <ul style="list-style-type: none"> ○ There is no National CC Adaptation Strategy despite recommendations to develop this strategy made by several concerned institutions. 																																								

Performance Category	Country Information
	<ul style="list-style-type: none"> ▪ Existence of a Actions Plans on Water for Climate Change resilience: <ul style="list-style-type: none"> ○ No. ▪ Existence of Programmes for implementing the Actions plans: <ul style="list-style-type: none"> ○ No ▪ Sources of verification and Specific comments: <ul style="list-style-type: none"> ○ National Authority for Scientific Research ○ Environment General Authority. ○ National Center for Meteorology.
<p>PC. 4.2. Water-related Hazards</p> <p><i>Target:</i></p> <p>Establish at least 1 Early warning System for disaster prevention at national level by 2015.</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone (<i>water disaster prevention initiatives</i>): <ul style="list-style-type: none"> ○ Establishment of the National Safety Authority in 2008 which is affiliated directly with the Prime Ministers Council. Its mandate includes water disaster management. ○ Establishment of the Environmental Emergencies Administration in the General Environment Authority whose mandate include environmental monitoring and disaster mitigation. ○ Preparation of the National Plan for Natural Disaster Management. ▪ Existence of Early Warning Disaster prevention System and Year of establishment: <ul style="list-style-type: none"> ○ No. ▪ Sources of verification: <ul style="list-style-type: none"> ○ Environment General Authority. ○ National Safety Authority
	<ul style="list-style-type: none"> ▪ Specific comments: <ul style="list-style-type: none"> ○ This goal is likely to be realized as the National Plan for Disaster Management exists. Updating of this plan and establishment of an early warning system is part of this plan. ○ Bodies concerned with early warning are still in early stages of formation; there is little experience, lack of skilled personnel and equipment, and above all, lack of a national strategy. ○ Bodies concerned take part in regional and international events to benefit from accumulated experience and know-how. ○ There is a clear overlapping in mandates and a lack of coordination between concerned bodies.
<p>PC. 5.1. Institutional arrangements</p> <p>PC. 5.2. Ethics, transparency, empowerment</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ul style="list-style-type: none"> ○ Establishment of the Ministry of Water Resources (MoWRs) which combined for the first time most of the organizations/institutions dealing with water. It controls planning and execution decisions on water centrally. ○ Existence of water law and environmental protection law. ○ Formation of several committees by the MoWRs to draft an action plan and craft policies for integrated water resources management. ○ Formation of a water research center within the MoWRs. ▪ Existence of Water sector policy that reflects good governance principles, and Year of latest update: <ul style="list-style-type: none"> ○ A policy on good governance does not exist. However, the National Strategy for Integrated Water Resources Management and the action plans of water concerned institutions included continuously upgrading of institutional capacities with strong stress on governance.
<p>PC. 5.3. Public and private roles</p> <p>PC. 5.4. Right to water</p> <p>PC. 5.5. Regulatory approaches</p>	<p><u>Elements on Partnership and commitment:</u></p> <ul style="list-style-type: none"> ○ Policies of institutions don't address partnership explicitly while partners roles are not well defined and exclusive. Overlapping exists in roles. Coordination and cooperation are unstructured. ○ Commitment varies with institutions and their capacities. Lack of monitoring and accountability leave the door open for institutions to be completely committed or not committed at all. This phenomenon is enforced by weak legislation and overlapping mandates.

Performance Category	Country Information																												
	<p>Elements on Ethics - transparency, equity and fairness:</p> <ul style="list-style-type: none"> ○ Establishment of the National Congress as a representative system whose members are accountable to their constituents. ○ Establishment of a transparency Committee within the Higher Judicial system of Libya. ○ Establishment of Infrastructures Committee and Legislation Committee's within Libya's National Congress. ○ Establishment of several water/environment non-government organizations. ○ Establishment of many mass media organizations (papers, radio and television stations) with a multi-faceted role of informing and uncovering of government actions. ○ Water from major sources (Manmade River) is allocated "equitably" between users with special attention to domestic users, water-short agricultural areas, and existing agricultural projects (settlements). ○ Water costs are subsidized in consideration of its significance to domestic and agricultural users. ○ Water use regulations are known to all users and applied fairly. 																												
<p>Target: Institute/update, by 2015, water sector policy reforms that reflect good governance principles of:</p>	<p>Elements on responsibility and accountability:</p> <ul style="list-style-type: none"> ○ These elements are not always stated clearly in regulations; moreover, their applications are very limited. <p>Elements on inclusiveness, participation, predictability and responsiveness:</p> <ul style="list-style-type: none"> ○ These elements are not well defined. Role of stakeholders is evolving slowly and is "unseen" presently. Use of private water sources and independence of users from the government may be the cause of this poor participation. Predictability and responsiveness are neither well defined nor addressed in water policies. 																												
<p>(i) Partnership commitment; (ii) ethics -transparency, equity and fairness; (iii) responsibility</p>	<p>Elements on Coherence:</p> <ul style="list-style-type: none"> ○ These elements are neither well defined nor well adhered to. ▪ Sources of verification: <ul style="list-style-type: none"> ○ National Strategy for Integrated Water Resources Management (2000-2025). ○ GWA reports. 																												
<p>and accountability; (iv) inclusiveness, participation, predictability and responsiveness; and (v) coherence.</p>	<ul style="list-style-type: none"> ▪ Specific comments: <ul style="list-style-type: none"> ○ Water sector policies have always been centrally planned and executed. Water legislation and management practices have focused on addressing the users' needs at practically no cost to the user. This practice did not encourage user participation or the development of good governance. 																												
<p>PC. 6.1. Financing Local Authorities</p> <p>Targets:</p> <p>-Allocate immediately at least 0.5 % of GDP to sanitation & hygiene.</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ul style="list-style-type: none"> ○ Full commitment to financing all water supply and sanitation schemes as well as operation and maintenance of these schemes. ▪ Achievement for GDP allocation: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- GDP (A_i)</td> <td>39.71</td> <td>63.1</td> <td>74.8</td> <td>34.7*</td> <td>81.9</td> <td>73.6</td> </tr> <tr> <td>- Sanitation and Hygiene Budget (B_i)</td> <td>1.91</td> <td>1.91</td> <td>1.91</td> <td>1.91</td> <td>1.91</td> <td>1.91</td> </tr> <tr> <td>Percentage of GDP to Sanitation and Hygiene gdpSH (%) = B_i/A_i</td> <td>5</td> <td>3</td> <td>3</td> <td>6</td> <td>2</td> <td>3</td> </tr> </tbody> </table> <p>*Estimated</p>	Years (i)	2008	2009	2010	2011	2012	2013	- GDP (A _i)	39.71	63.1	74.8	34.7*	81.9	73.6	- Sanitation and Hygiene Budget (B _i)	1.91	1.91	1.91	1.91	1.91	1.91	Percentage of GDP to Sanitation and Hygiene gdpSH (%) = B_i/A_i	5	3	3	6	2	3
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and -Allocate immediately 5% of national budget for water & sanitation.	<p>Achievement for national budget allocation:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- Total National Budget (A₂)</td> <td>19.86</td> <td>19.21</td> <td>21.75</td> <td>32*</td> <td>48</td> <td>53</td> </tr> <tr> <td>- Water and Sanitation Budget (B₂)</td> <td>2.86</td> <td>2.86</td> <td>2.86</td> <td>2.86</td> <td>2.86</td> <td>2.86</td> </tr> <tr> <td>Percentage of national Budget to Water and Sanitation</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>BdgWS (%) = B₂/A₂</td> <td>14</td> <td>15</td> <td>13</td> <td>9</td> <td>6</td> <td>5</td> </tr> </tbody> </table> <p>*Estimated</p>	Years (i)	2008	2009	2010	2011	2012	2013	- Total National Budget (A ₂)	19.86	19.21	21.75	32*	48	53	- Water and Sanitation Budget (B ₂)	2.86	2.86	2.86	2.86	2.86	2.86	Percentage of national Budget to Water and Sanitation							BdgWS (%) = B₂/A₂	14	15	13	9	6	5
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	<ul style="list-style-type: none"> ▪ Specific comments: ○ Targets have been met. ○ Values for GDP and budget are in US dollars. ○ Investments in WSS have been very large. ○ Actual amounts spent may vary from allocated budgets reported above. However, a strong commitment can still be seen from the high percentages planned. ○ Improvements may be constrained by the ability of execution bodies (contractors, etc.) rather than by the availability of financing/funding. 																																			
<p>PC. 6.2. Pricing Strategies</p> <p>PC. 6.3.Pro-poor financing Strategies</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: ○ The water law states that water is a common property and that every citizen has the right to water for different uses. This principle is the base for all water strategies including pricing strategies. ○ A tariff for water according to user type is in place. ○ Water prices are higher than water tariffs. ○ The cost difference is subsidized by the state reflecting a pro-poor financing strategy. ○ The state finances all infrastructure projects (construction, operation and maintenance). This has been the implemented strategy since independence (1951). 																																			
<p><i>Target:</i> Set by 2015, water tariff system that addresses cross-subsidy and the need of poor.</p>	<ul style="list-style-type: none"> ▪ Describe the Water Tariff Structure: ✓ <i>Lifeline Water (l/ca/day):</i> 150-350 ✓ <i>Minimum salary of the population (Libyan dinar LYD):</i> 450 ✓ <i>Rate (USD / LYD):</i> 1 USD for 1.26 LYD <p><u>Tariff Structure:</u></p> <table border="1"> <thead> <tr> <th>(Consumption categories (m³</th> <th>(Rate (local currency</th> </tr> </thead> <tbody> <tr> <td>XX m³ ></td> <td>XXX llcc/ m³</td> </tr> <tr> <td>XX m³ to XX m³</td> <td>XXX llcc/ m³</td> </tr> <tr> <td>XX m³ to XX m³</td> <td>XXX llcc/ m³</td> </tr> <tr> <td>XX m³ <</td> <td>XXX llcc/ m³</td> </tr> <tr> <td>?Any other specific charge</td> <td>LYD/ m³ 0.25</td> </tr> </tbody> </table>	(Consumption categories (m ³	(Rate (local currency	XX m ³ >	XXX llcc/ m ³	XX m ³ to XX m ³	XXX llcc/ m ³	XX m ³ to XX m ³	XXX llcc/ m ³	XX m ³ <	XXX llcc/ m ³	?Any other specific charge	LYD/ m ³ 0.25																							
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	<p><u>Tariff for rural areas if any:</u></p> <ul style="list-style-type: none"> ○ None ▪ Describe the sanitation services pricing if there is any: <ul style="list-style-type: none"> ○ Included with water supply tariffs. ▪ Sources of verification: <ul style="list-style-type: none"> ○ National Water Strategy. ○ General Water and Wastewater Company. ○ Manmade Execution and Management Authority. 															
	<ul style="list-style-type: none"> ▪ Specific comments: <ul style="list-style-type: none"> ○ Water tariffs vary with user type. ○ Water tariffs include both water supply and sanitation. ○ Tariffs don't cover of water production. Domestic and commercial uses are subsidized by the state. ○ Tariffs cover only about one third of the total cost; the remainder is subsidized by the state. ○ The state subsidizes heavily the water production organizations. ○ Tariffs recovery rate is low. ○ For a hypothetical 5 persons family: <ul style="list-style-type: none"> ✓ $water\ used = 175\ l/c/d * 5 * 30 / 1000 = 26.3\ m^3$ ✓ $cost\ at\ 0.25\ LYD/m^3 = 6.6\ LYD$ ✓ $\%\ of\ minimum\ monthly\ income = 6.6/450 = 1.5\ \% < 3\ \%$ 															
PC. 7.1. Education and capacity development <i>Target:</i> To be identified.	<ul style="list-style-type: none"> ▪ <i>Not to be reported.</i> 															
PC. 7.2. Information <i>Target:</i> Enhance by 2016, the national water and sanitation Monitoring, Evaluation and Reporting (M&E, &R) Systems in a way to be in line with the pan African M&E.	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: <ul style="list-style-type: none"> ○ M&E systems have been incorporated into most organs involved with water supply although at subsectoral levels only. ○ M&E systems have been incorporated into the transboundary basins agreements. ○ M&E systems don't evolve from Africa-wide systems as such systems have only been in use recently. However, it is expected that the present M&E systems are in line with the African M&E systems. ▪ Existence of national Water & Sanitation M&E, & R System, and Year of Establishment. <ul style="list-style-type: none"> ○ A national Water & Sanitation M&E, & R system does not exist. However, annual plans are made by the General Company for Water and Wastewater, a sub-organ of the Ministry of Housing and Utilities with basic M&E&R operations. <p><u>Recent updates in the M&E System:</u></p> <table border="1"> <thead> <tr> <th>Items</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>New Elements incorporated-</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> </tr> <tr> <td>Drivers-</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> <td>xxxx</td> </tr> </tbody> </table>	Items	Year 1	Year 2	Year 3	2011	New Elements incorporated-	xxxx	xxxx	xxxx	xxxx	Drivers-	xxxx	xxxx	xxxx	xxxx
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Performance Category	Country Information
	<p><u>Elements of the pan African M&E incorporated:</u></p> <ul style="list-style-type: none"> ○ Institutional capacity building. ○ Improving governance. ○ Improving knowledge base. ○ Improving financing. ○ Meeting the MDGs in water supply and sanitation. ○ Meeting Sharm-elSheikh and Africa Water Vision 2025.
	<ul style="list-style-type: none"> ▪ Sources of verification: <ul style="list-style-type: none"> ○ General Water Authority. ○ General Environment Authority. ○ General Company for Water and Wastewater. ○ Manmade River Execution and Management Authority
	<ul style="list-style-type: none"> ▪ Specific comments: <ul style="list-style-type: none"> ○ A unified national Water & Sanitation M&E&R system does not exist. However, institutional responsibilities/mandates do include M&E&R procedures. ○ The M&E&R mechanisms and database are not coherent and the efforts are not well coordinated. ○ Implementation of the M&E&R procedures by all institutions is weak. ○ The water sector database is fragmented, not up-to-date, with little analysis and reporting on any level. ○ Some organizations have good data, however, namely, the Manmade River Execution and Management Authority and, to some extent, the General Water Authority. ○ All organization concerned are well aware of the need for M&E&R on a nationally coordinated level. Efforts are led by the Ministry of Water Resources to establish such networks. ○ Implementation of MEWINA will certainly accelerate these efforts and set a unified standard for both Libyan and Pan African networks and reporting.
<p>PC. 7.3. Water and Technologies <i>Target:</i> To be identified.</p>	<ul style="list-style-type: none"> ▪ <i>Not be reported.</i>
<p>PC. 7.4. Professional Networks/Associations <i>Target:</i> To be identified.</p>	<ul style="list-style-type: none"> ▪ <i>Not be reported.</i>

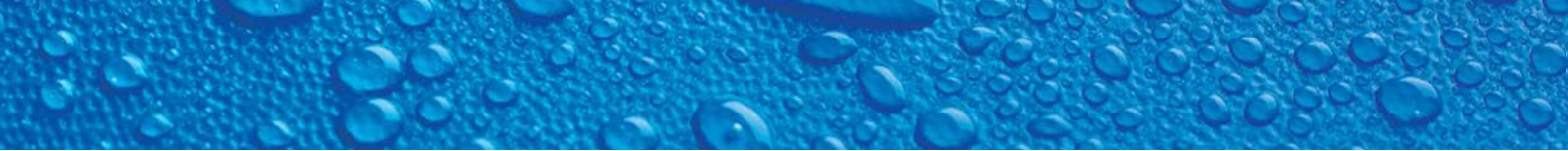
Mauritania AMCOW Pan African M&E Performance Sheet

Country Background Information Sheet

Country Name: **Mauritania**

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2. The foundations of the current Water Policy / The potential targets and reforms	<p><i>Important issues addressed in the existing reform of the water Sector?</i></p> <p>a) The strengthening of the entities' capacities</p> <p>b) Elaboration of precise specifications charges including performance to be achieved (private connections, extensions) to private operators. New forms of contracts will be tested in several centers and lessons in rural and semi-urban areas will be released</p>																														
	<p>c) The establishment of a transparent and collaborative programming of investments(publication of the annual program of physical implementation)</p> <p>d) Identification of performance indicators for monitoring operators</p> <p>e) The implementation of training actions to enhance professionalism in the sector</p> <p>f) The introduction of means for central departments of the Ministry of Water and Sanitation and municipalities to fulfill their role of project management</p> <p>g) Implementation of adequate infrastructure at central and decentralized levels to accommodate departmental services</p> <p>h) Strengthening the decentralized services through a qualified personnel</p>																														
	<p>i) The improvement of overstaffing and unqualification situation existing in the different structures of the Ministry of Water and Sanitation</p> <p>j) The development of the role of regional support and advice services to municipalities to enhance project execution</p> <p>k) Support for decentralized services that are intended to enable the municipalities to implement sustainable management of drinking water supply</p>																														
	<p>l) Strengthening the national capacity for producing wells</p> <p>m) Strengthening the capacity of water treatment (including desalination)</p> <p>n) The capacity to control surface water (Senegal River, reservoir, permanent ponds and lakes, oasis) for better water supply for populations wherever possible</p> <p>o) Strengthening of capacities for the development and construction of autonomous sanitation facilities</p>																														
	<p><i>Which are better known and applied in the country? Specify how they are applied.</i></p> <p>1. In 2000, the Islamic Republic of Mauritania has adopted the «Millennium Declaration» and pledged to reduce at its half, "by 2015", the proportion of people without sustainable access to safe drinking water including sanitation.</p> <p>2. In 2001, a Strategic Framework for the Fight against Poverty (CSLP) is developed and used as a reference for the strategic directions of the sectors including the water sector with the adoption of a multi-sectoral universal access policy to the basic services for the implementation of new mechanisms to ensure greater efficiency of State contribution to the investment. This strategic framework has been updated for the 2006-2010 and 2011-2015 periods.</p>																														
	3. Knowledge of international and African targets in the area of water and sanitation																														

	<p>3. Since 2005, a consultation with the various actors involved in the water sector has been initiated to ensure better visibility of the sector and strengthen coordination. A sectorial review of the rural sector was organized in June 2005 followed by a round table of donors in 2006 to mobilize financial resources for the achievement of the Millennium Development Goals (MDGs). In 2007, a review of public sector spending was organized and a National Water Council, established under the Water Code, held its first session in 2009.</p>									
	<p>4. The evolution of the sector and the commitments of the Government has made it necessary to revise the «Strategy for Development of the Water Sector and Sanitation» adopted in 2009. This strategy guides the action of the government in Water Sector and Sanitation according to its strategic axis and to the action plan to be implemented. It focuses on improving sector governance, the development of the Integrated Management of Water Resources and access to drinking water and sanitation.</p>									
4. Trends of the last 3 updates in policies and national water reform	<table border="1"> <thead> <tr> <th>Years</th> <th>Years 11</th> <th>Year 12</th> </tr> </thead> <tbody> <tr> <td>Reasons for the update</td> <td>Updating of the Strategic Framework of the Action against Poverty (PRSP) from 2006 to 2010 to better adapt it to the new context of the sector.</td> <td>Development Strategy of Water and Sanitation Sector of May 21, 2012.</td> </tr> <tr> <td>Effectiveness of targeted impacts</td> <td>New mechanisms to provide better efficiency of the contribution of the State to investment.</td> <td>Improving the access rate to water for people, Improvement of knowledge of water resources, Increasing funding of the water sector.</td> </tr> </tbody> </table>	Years	Years 11	Year 12	Reasons for the update	Updating of the Strategic Framework of the Action against Poverty (PRSP) from 2006 to 2010 to better adapt it to the new context of the sector.	Development Strategy of Water and Sanitation Sector of May 21, 2012.	Effectiveness of targeted impacts	New mechanisms to provide better efficiency of the contribution of the State to investment.	Improving the access rate to water for people, Improvement of knowledge of water resources, Increasing funding of the water sector.
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5. Comments on the water sector at the national level in terms of strengths, weaknesses opportunities, threats, and major difficulties	<p>5. The strengths</p> <p>5.1 The strengths of the sector are as follows:</p> <p>5.2 A regulatory and institutional framework with the roles and missions of the various public and private stakeholders and the creation of a framework for cooperation at central and regional levels;</p> <p>5.3 Better support for sanitation and surface waters in the sector action;</p> <p>5.4 A system of delegated management of networks in rural and semi-urban areas nationwide, including the recovery of recurrent costs.</p>									
	<p>6. The constraints</p> <p>Several constraints remain to be overcome despite efforts undertaken:</p> <p>6.1 Lack of implementation of the regulatory framework and poor coordination among different players in the sector. Many stakeholders are outside the control of the administration. Major water programs are designed and made by external structures of the Ministry of Water and Sanitation without consulting it:</p> <p>a) The Ministry of Rural Development conducts dams and implements projects that perform hydraulic works</p> <p>b) The Commissioner for Human Rights, Humanitarian Action and Relations with Civil Society, which funds and runs some water infrastructure projects;</p> <p>c) The Office of Food Security, which operates through the implementation of water points and bunds;</p> <p>d) The Ministry of Economic Affairs and Development, which supervises the APAUS and PDU running hydraulic and sanitation programs;</p> <p>e) The Ministry of Housing, Urban and Spatial Planning which intervenes through various projects;</p> <p>f) The Ministry of Interior and Decentralization through the implementation of the program ANAIR in hydraulics;</p> <p>g) The interventions of national and international NGOs in the sector.</p>									



6.2 The weak capacity of services is a major constraint to development of the sector of water and sanitation. This constraint is manifested by a lack of qualified staff, lack of training for all key stakeholders (public sector, private sector, NGOs ..).

6.3 Weak national capacity of the private sector in terms of education, work and maintenance;

6.4 The financial equilibrium of the sector is as follows:

- a) It is tight in urban areas due to the low efficiency and high losses in networks and the high cost of energy;
- b) In rural and semi urban areas, urban development master plans do not exist, are poorly sized networks, pricing is not homogeneous, the recovery rate is low and the costs of operation and maintenance are not well performed.

6.5 Several major cities face, repeatedly, severe flooding due to the lack of Rainwater treatment infrastructure.

Country Water and Sanitation Performances Evaluation Sheet

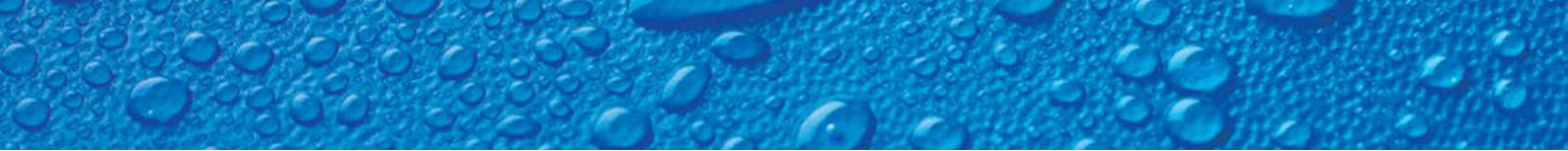
Country Name: **Tunisia**

Performance Category	Country Information																																																															
<p>Theme 1: Infrastructure of water for economic development.</p> <p>PC. 1.1. Water and Energy</p> <p>Target: Increase the use of hydro-energy by 10% between 2000 and 2015.</p>	<p>-Specific actions taken to achieve the target: STEG proceeded to achieve the following: (i) renovation and modernization of old hydro power plants by using modern equipment like static excitation, microprocessor based controls, electronic governors, high speed static relays, data logger, vibration monitoring etc; but it is not enough to achieve the target</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2012</th> <th>2013</th> <th>2014</th> </tr> </thead> <tbody> <tr> <td>- Hydroelectric potential economically feasible GWh(P)</td> <td>217.25</td> <td>217.25</td> <td>217.25</td> <td>217.25</td> <td>217.25</td> <td>217.3</td> <td>217.25</td> </tr> <tr> <td>-Hydro-electric capacity installed MWh(C)</td> <td>30</td> <td>30</td> <td>30</td> <td>30</td> <td>30</td> <td>70</td> <td>70</td> </tr> <tr> <td>-Index of the usage of the hydropower (Hpul = C/P)</td> <td>0.138</td> <td>0.138</td> <td>0.138</td> <td>0.138</td> <td>0.138</td> <td>0.322</td> <td>0.322</td> </tr> <tr> <td>Growth rate R_iHpul(%) = (Hpul_i - Hpul₂₀₀₀)/Hpul₂₀₀₀</td> <td>-</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>133</td> <td>133</td> </tr> </tbody> </table> <p>-Sources of verification and specific comments: Ministry of Petroleum, Energy, and Mining</p>	Years (i)	2000	2008	2009	2010	2012	2013	2014	- Hydroelectric potential economically feasible GWh(P)	217.25	217.25	217.25	217.25	217.25	217.3	217.25	-Hydro-electric capacity installed MWh(C)	30	30	30	30	30	70	70	-Index of the usage of the hydropower (Hpul = C/P)	0.138	0.138	0.138	0.138	0.138	0.322	0.322	Growth rate R_iHpul(%) = (Hpul_i - Hpul₂₀₀₀)/Hpul₂₀₀₀	-	0	0	0	0	133	133																							
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<p>PC. 1.2. Water and Agriculture</p> <p>Targets: -Increase water productivity Rain fed agriculture & Irrigation by 30% from 2000 to 2015.</p> <p>and -Increase the size of irrigated areas by 50% from 2000 to 2015</p>	<p>-Specific actions taken to achieve the target:</p> <p>Level of achievement for agricultural productivity:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> </tr> </thead> <tbody> <tr> <td>-Agricultural GDP (10⁹ USD) (A)</td> <td>0.09</td> <td>0.13</td> <td>0.14</td> <td>0.16</td> <td>0.10</td> <td>0.11</td> </tr> <tr> <td>-Total water withdrawn for irrigated and rain fed agriculture (10⁹ m³)(B)</td> <td>1.480</td> <td>1.495</td> <td>1.492</td> <td>1.496</td> <td>1.499</td> <td>1.500</td> </tr> <tr> <td>-Water Return to Environment 10⁹ m³ (C)</td> <td>1.370</td> <td>1.364</td> <td>1.363</td> <td>1.355</td> <td>1.343</td> <td>1.467</td> </tr> <tr> <td>Water productivity (USD/ m³) Wp=A/(B-C)</td> <td>0.82</td> <td>0.99</td> <td>1.08</td> <td>1.1</td> <td>0.60</td> <td>0.75</td> </tr> <tr> <td>Rate of increase R_iWp(%) = (Wp_i - Wp₂₀₀₀)/Wp₂₀₀₀</td> <td>-</td> <td>20</td> <td>31</td> <td>34</td> <td>-26</td> <td></td> </tr> </tbody> </table> <p>- Achievement on irrigated areas:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> </tr> </thead> <tbody> <tr> <td>-Irrigated areas(IA) in hectares</td> <td>21368</td> <td>23188</td> <td>13428</td> <td>26393</td> <td>32052</td> <td>31 000</td> </tr> <tr> <td>Rate of increase R_iIA(%) = (IA_i - IA₂₀₀₀)/IA₂₀₀₀</td> <td>-</td> <td>0,085</td> <td>-0,371</td> <td>0,235</td> <td>0,5</td> <td>0,451</td> </tr> </tbody> </table> <p>-Sources of verification and specific comments: Department of Planning, Cooperation, and Supervision – Ministry of Rural Development</p>	Years (i)	2000	2008	2009	2010	2011	2012	-Agricultural GDP (10 ⁹ USD) (A)	0.09	0.13	0.14	0.16	0.10	0.11	-Total water withdrawn for irrigated and rain fed agriculture (10 ⁹ m ³)(B)	1.480	1.495	1.492	1.496	1.499	1.500	-Water Return to Environment 10 ⁹ m ³ (C)	1.370	1.364	1.363	1.355	1.343	1.467	Water productivity (USD/ m³) Wp=A/(B-C)	0.82	0.99	1.08	1.1	0.60	0.75	Rate of increase R_iWp(%) = (Wp_i - Wp₂₀₀₀)/Wp₂₀₀₀	-	20	31	34	-26		Years (i)	2000	2008	2009	2010	2011	2012	-Irrigated areas(IA) in hectares	21368	23188	13428	26393	32052	31 000	Rate of increase R_iIA(%) = (IA_i - IA₂₀₀₀)/IA₂₀₀₀	-	0,085	-0,371	0,235	0,5	0,451
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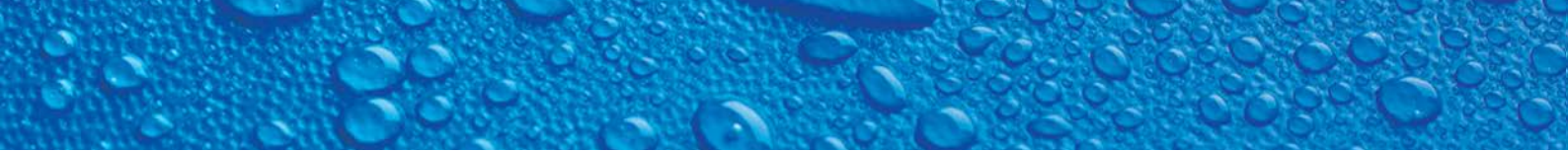
<p>PC. 1.3. Water for multiple Uses</p> <p><u>Target:</u></p> <p>Increase the Water Demand Satisfaction Index (<i>WDSI</i>) by 10% from 2000 to 2015.</p>	<p>Specific actions taken so far for the milestone:</p> <p>National Plan for the Public Management of Water Resources</p> <p>Achievement:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> </tr> </thead> <tbody> <tr> <td>- *Total all sectors Water Demand 10^9m^3 (A)</td> <td>2.508</td> <td>3.162</td> <td>3.251</td> <td>3.341</td> <td>3.432</td> <td>3.450</td> </tr> <tr> <td>- **Total all sectors water supply (B)</td> <td>1.442</td> <td>1.462</td> <td>1.496</td> <td>1.537</td> <td>1.570</td> <td>1.700</td> </tr> <tr> <td>- WDSI = B/A</td> <td>0.575</td> <td>0.462</td> <td>0.460</td> <td>0.460</td> <td>0.457</td> <td>0.464</td> </tr> <tr> <td>Rate of increase $R_i WDSI$ (%) = $(WDSI_i - WDSI_{2000}) / WDSI_{2000}$</td> <td>0</td> <td>0.19598</td> <td>0.00444</td> <td>0.00023</td> <td>0.00578</td> <td>0.013848</td> </tr> </tbody> </table> <p><u>Sources of verification and specific comments:</u></p> <p>This data was obtained from the National Water Company and the National Office of Water Services in Rural Areas</p>	Years (i)	2000	2008	2009	2010	2011	2012	- *Total all sectors Water Demand 10^9m^3 (A)	2.508	3.162	3.251	3.341	3.432	3.450	- **Total all sectors water supply (B)	1.442	1.462	1.496	1.537	1.570	1.700	- WDSI = B/A	0.575	0.462	0.460	0.460	0.457	0.464	Rate of increase $R_i WDSI$ (%) = $(WDSI_i - WDSI_{2000}) / WDSI_{2000}$	0	0.19598	0.00444	0.00023	0.00578	0.013848
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<p>PC. 2.1:</p> <p>Transboundary basins and water resources management</p> <p><u>Target:</u></p> <p>Develop a national Water Efficiency Plan by 2015.</p>	<p>Specific actions taken so far for the milestone:</p> <p><i>- Mauritanian Water Law (Law No. 2005-30 issued on February 2, 2005, containing the water law) calls for adopting and implementing a national master plan for the organization and integrated management of water in a public water resources management framework. In the wake of the evaluation of sector status, it was implemented with support of the United Nations Development Programme and the steps were taken in this direction in order to better management of water resources. The implementation of a large project on behalf of the organization and public management of water resources in Mauritania resulted in a comprehensive process of drafting with the support and the help of some partners.</i></p> <p><i>The water resources management action plan is fully consistent with the reform process which began in the water sector in Mauritania more than a decade ago, where Law No. 2005-30 issued on February 2, 2005 remains. It contains the Water Act; a significant achievement within the framework of the reform process. Mauritania has, under this law, chosen the overall management of water resources as an approach to sustainable management of water resources.</i></p> <p><i>In this context, the government has developed a national plan of public management of water resources through the involvement of all actors in the sector (residents, local communities, consumers and professionals).</i></p> <p><i>The national action plan for public administration for water is a tool for priority works pertaining to the water sector, which makes its implementation a must, for the sake of sustainable development and coordinated water management.</i></p> <p><i>Existence of an effective water plan or general authority for water resources plan and the year of approval: The government has set a national plan for public management of water resources through the involvement of all actors in the sector (residents, local communities, consumers and professionals).</i></p> <p><i>Elements of funding structure: The UNDP supported the design of the programme and its formulation. The African Bank for Development and the European Commission delegation in Mauritania have expressed their interest in funding the primary stage of the project, while the Spanish Agency for International Development Cooperation and the French Development Agency, as well as other partners, have agreed to support the programme.</i></p> <p>Management tools:</p> <p><u>Sources of verification and specific comments:</u></p>																																			

<p>PC. 2.2. Rainwater</p> <p>Target:</p> <p>Increase the share of rainwater use in total municipal water consumption up to 10% by 2015.</p>	<p>Specific actions taken so far for the milestone:</p> <p>- Rainwater is not controlled in Mauritania. Sources (B) and (C) are negligible</p> <p>Achievement:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>- Total municipal water supply(A)</td> <td>42 588 000</td> <td>42 984 000</td> <td>57 492 000</td> <td>57 840 000</td> </tr> <tr> <td>- Rainwater use (Mm³) (B)</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>- Water use from other sources (Mm³) (C)</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Total municipal water consumption (%) (T_{wc} = A+B+C)</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Percentage of rainwater use p_{Ru} (%)=B/T_{wc}</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p>-Sources of verification and specific comments:</p>	Years (i)	2008	2009	2010	2011	- Total municipal water supply(A)	42 588 000	42 984 000	57 492 000	57 840 000	- Rainwater use (Mm ³) (B)	-	-	-	-	- Water use from other sources (Mm ³) (C)	-	-	-	-	Total municipal water consumption (%) (T _{wc} = A+B+C)	-	-	-	-	Percentage of rainwater use p _{Ru} (%)=B/T _{wc}	-	-	-	-																																																						
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<p>PC. 3.1. Urban Water Supply</p> <p>PC. 3.2. Urban Sanitation</p> <p>PC. 3.3. Rural Water Supply</p> <p>PC. 3.3. Rural Sanitation and Hygiene</p> <p>Target:</p> <p>Reduce by 50% from 1990 to 2015, the proportion of the population without improved drinking water source, and the proportion without improved sanitation facility (Urban/Rural / Total).</p>	<p>Specific actions taken so far for the milestone:</p> <p><i>The completion of the Aftout coastal projects to supply drinking water to the city of Nouakchott, the eastern Aftout project in the Fom Jlatin area (Hope Triangle), Dar Na'amah project and the PNSIR project in Brakna - Gorgol region are crucial steps towards achieving the Millennium Development Goals as well as orientations and objectives for the fight against poverty.</i></p> <p>Achievement in water supply:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> </tr> </thead> <tbody> <tr> <td>-Urban access (%)</td> <td>25</td> <td>30</td> <td>32</td> <td>35</td> <td>56</td> <td>65</td> </tr> <tr> <td>-Rural access (%)</td> <td>35</td> <td>51</td> <td>53</td> <td>56</td> <td>59</td> <td>60</td> </tr> <tr> <td>-Total access (%) (W)</td> <td>0.00</td> <td>0.19</td> <td>0.21</td> <td>0.21</td> <td>0.37</td> <td>0.44</td> </tr> <tr> <td>Rate of Inaccessibility reduction for water</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>IR_{wat} (%) = (W_i-W₁₉₉₀)/(100-W₁₉₉₀)</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p>Achievement in improved sanitation:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> </tr> </thead> <tbody> <tr> <td>-Urban access (%)</td> <td>35</td> <td>48</td> <td>55</td> <td>60</td> <td>58</td> <td>60</td> </tr> <tr> <td>-Rural access (%)</td> <td>25</td> <td>33</td> <td>36</td> <td>40</td> <td>42</td> <td>40</td> </tr> <tr> <td>-Total access (%) (S)</td> <td>30</td> <td>38</td> <td>40</td> <td>43</td> <td>45</td> <td>46</td> </tr> <tr> <td>Rate of Inaccessibility reduction for sanitation</td> <td>0</td> <td>11.4</td> <td>14.3</td> <td>18.6</td> <td>21.4</td> <td>22.9</td> </tr> <tr> <td>IR_{san} (%) = (S_i-S₁₉₉₀)/(100-S₁₉₉₀)</td> <td>0</td> <td>11.4</td> <td>14.3</td> <td>18.6</td> <td>21.4</td> <td>22.9</td> </tr> </tbody> </table> <p>Sources of verification and specific comments: Water and Sanitation Sector Development document – 2012</p>	Years (i)	1990	2008	2009	2010	2011	2012	-Urban access (%)	25	30	32	35	56	65	-Rural access (%)	35	51	53	56	59	60	-Total access (%) (W)	0.00	0.19	0.21	0.21	0.37	0.44	Rate of Inaccessibility reduction for water	-	-	-	-	-	-	IR _{wat} (%) = (W _i -W ₁₉₉₀)/(100-W ₁₉₉₀)	-	-	-	-	-	-	Years (i)	1990	2008	2009	2010	2011	2012	-Urban access (%)	35	48	55	60	58	60	-Rural access (%)	25	33	36	40	42	40	-Total access (%) (S)	30	38	40	43	45	46	Rate of Inaccessibility reduction for sanitation	0	11.4	14.3	18.6	21.4	22.9	IR _{san} (%) = (S _i -S ₁₉₉₀)/(100-S ₁₉₉₀)	0	11.4	14.3	18.6	21.4	22.9
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<p>PC. 4.1. Adaptation to Climate Change</p> <p>Target:</p> <p>Develop and implement, at least 1 Climate Change Adaptation Strategy by 2015.</p>	<p>Specific actions taken so far for the milestone (New initiatives to improve resilience):</p> <ul style="list-style-type: none"> - Mauritania has signed many international agreements and conventions on environmental protection. The most important agreements are: the United Nations Convention to Combat Desertification, the United Nations Convention on Biological Diversity, the United Nations Convention on Climate Change and the Kyoto Protocol, and the Ramsar Convention on Wetlands of International Importance areas. <p>The strategy and action plan, which was dependent on five main points, is based on:</p> <ul style="list-style-type: none"> - Support institutional and political means for efficient environment and natural resources management; - Encourage and improve the permanent benefit from natural resources (match the third strategic framework of fighting against poverty); - Enhance the overall management and effective use of natural resources; - The local and comprehensive environment management in accordance with the commitments taken within the framework of multilateral environmental conventions. - Establish and enhance strategic financing mechanisms for sustainable development. - Implement these strategic axes through 17 operational axes in the form of specific targets. <p>Effective and orderly implementation of the Environmental National Plan of Action has become imperative if we are to respond, objectively and easily to be evaluated, to the immediate environmental requirements and the challenges. These requirements and challenges are soon to become increasingly important and affects strongly the standard of living and the quality of life as well as the balance of vital macroeconomic. Two evaluations were conducted by the department responsible for the outcome of the environmental national action plan. They announced that the implementation reached 32% of the total operational axes for five strategic axes, but some defects were labeled in the methodology used for the assessments as well as the seriousness of old and ineffective arrangements, all if they are not reviewed and updated as soon as possible.</p>
	<p>Among the opportunities offered by the political environment analysis the following:</p> <ol style="list-style-type: none"> 1. Establishment of a ministerial department assigned exclusively to environmental management. 2. Technical and financial partners ensure the formation of a lobby in order to achieve these political goals, especially in priority areas. 3. A framework law provides three important tools for management of environment. 4. Inclusion of environment in the strategic framework for fighting poverty and integration of sustainable development as a political dimension in the task entrusted to the ministry <p>Environmental challenges:</p> <p>At a time when nothing indicates that the trend towards degradation of natural resources has stopped or rather taking a reverseing direction, we should extract a number of major challenges:</p> <ul style="list-style-type: none"> - Rapid spread of the desert where the available data shows that in the period between 1974 and 2004, turned out 150,000 square meters or 15% of the national land area to desert areas. - The deterioration of the fisheries resources and the marine environment. - Destruction of biodiversity (desertification, degradation of natural reserves and wetlands) - Poor coordination between institutions involved in the issue of sustainable development and environment. - Lack of planning and processing of land (the sectorial plan, the structural image, the municipal land planning) and occupancy of random spaces. - Rapid and random urban spread, and complete absence of reliable collective systems for the treatment of garbage and household waste. - The incomplete nature of the legal provisions for sustainable development and the environment. - The weakness of civil society participation in the formulation and implementation of public policies for sustainable development and the environment. - The shortcomings of the areas of media, education and communication in issues concerning environmental development.



	<p>The challenges of good governance: General framework for good governance in the country and the coherence of three rules of sustainable development will be emphasized.</p> <p>The environmental dimension: National Sustainable Development Strategy emphasizes that achieving sustainability of capital resources is a big challenge for Mauritania in the field of environment and sustainable development. To reach this goal, Mauritania, through programs with priority to the National Action Plan for the environment and other programs, exerted efforts in the environmental field, including:</p> <ul style="list-style-type: none"> - Comprehensive programs for development of irrigated agriculture in Mauritania. - Draft convention on biodiversity and combating land degradation in arid and semi-arid areas on the border between Mauritania and Senegal. - Management project of natural resources in the rainforest region. - Natural resource management project in the western basin Kede Magha state. - Household energy project.
	<p>Mauritania also has institutionalized environmental impact studies and established specialized structure for this purpose (Environmental Control Department) within the Ministry delegated to the Prime Minister and in charge of environment and sustainable development.</p> <p>On the other hand, Environment strategic planning, which is the gateway to the integration of environmental concerns in the decision-making process, occupy an axial place in the national action plan for the environment.</p> <p>The problem raised at this level is the ineffectiveness of public policies due to attributes of comprehensive good governance.</p> <p>The existence of the plan of action related to water in order to cope with climate change resulting from all previous developments, that since the Rio Conference, Mauritania has achieved important steps in the field of sustainable development. This is translated in particular through substantial development in the areas of economic growth, reduce poverty levels and good governance of the environment.</p> <p>The last point was particularly clear taking into account the environmental aspect in the overall national policies and strengthening the institutional framework and the regulatory sector, which controls the actual translation of international commitments taken by the country.</p> <p>Among these developments it should be noted that:</p> <ul style="list-style-type: none"> - Adoption of the strategic framework to fight poverty in 2011, and implementation of its business plans. The implementation of the two plans is done and the implementation of the third ongoing. - The ratification of the main international conventions concerning the environment and sustainable development. - The establishment of a ministerial department in charge of environmental affairs, which widened its mandate to include sustainable development. - Initiate and develop public policies to link sustainable development processes; - The adoption of national Strategy for Sustainable Development in 2006, the National Action Plan for the Environment, and National work plan for the management of disasters in 2007.



	<p>Prepared National plan to adapt to climate change in 2004, and is updated since 2011.</p> <p>The establishment of the National Council for Environment and Development and its decentralization systems known as regional councils for Environment and Development.</p> <p>The completion of an important business regards legalization, it has been translated through the adoption of a new matching texts of the conventions ratified by Mauritania and review some of the texts of suitability with the requirements of the reform process and to create favorable conditions for the implementation of the national strategy for sustainable development and the texts of other public policies;</p> <p>Comprehensive analysis of the system of good governance of the environment in all ministerial units that have environment-related activities and to propose appropriate reforms.</p> <p>Capacity building of actors on the environmental assessment as a means of re-integrating the environment.</p> <p>The preparation of 21 preliminary work program in 2010 (Aleg, Kiffa, Kinkosh) as a grantee for sustainable development planning activities at the unit level.</p> <p>Declare in the Framework Law of the Environment in 2000 to set up a fund to intervene in favor of the environment and the mobilization of public resources, technical, financial partners.</p> <p>Respect its international commitments fourth phase of framework of the of the operational program for microfinance adopted by International Bank for the Environment, the United Nations Convention on Climate Change, the Convention on Biological Diversity, and the Montreal and Kyoto protocols. In spite of the great progress, the challenges are still continuing. In fact, we face little set back in poverty and an increase in the number of poor people, and this is due to several reasons, including weak economic growth rate and limited benefits got by the poor from this growth.</p> <p>As shown above, this is due to a number of key factors including:</p> <ul style="list-style-type: none">- Deficiencies in the process of good governance in general.- The dual nature and poor distribution of the national economy.- The country's dependence on the outside and vulnerability to external shocks.- The lack of competitiveness in the private sector.- Limited ability to attract foreign aid.- Shortcomings in the areas of infrastructure to support the growth and continued deterioration of the environment and natural resources.
	<p>As described in the Action Plan for the year 2011-2015 strategic framework for the fight against poverty, this last factor is executed through the main points:</p> <p>Taking into account the special climatic hazards and sustainable management of land and natural resources in strategies and programs for development focusing on:</p> <ol style="list-style-type: none">1- Valuing natural product capital.2- Sustainable management of land and natural resources3- Land reclamation4- Integrated water resources, fishery resources, forests and ecosystems management through the special care of natural reserves and wetlands.5- Biodiversity conservation6- Integration of river beneficiaries in resources management

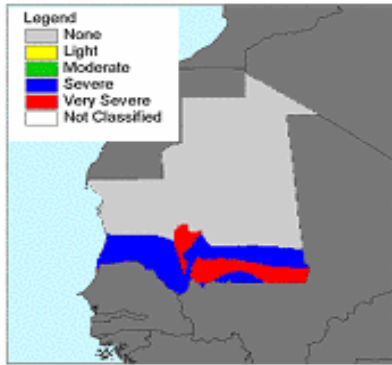
	<p>Promote good environmental governance:</p> <ol style="list-style-type: none"> 1. Media, education and communication support in the environmental field, by updated legal pillar, and a renewed institutional system for the sector and environmental action plan fit the national strategy for sustainable development. 2. Equip a national laboratory to monitor and follow up the environment. 3. Assess the risk of Senegal River water pollution in the framework of the project the northern Ovtoot. 4. Establishment of Wetlands observatories in Mauritania 5. Establishment of protected areas in Reshat. 6. Improve the protection of pastures and combat forest fires, especially through the implementation of a permanent structure concerning these two fundamental issues. 7. Rehabilitation and conservation of classified forests along with promotion of the cultivation of arid areas trees, which will benefit Great Green Wall Project 8. Accomplish Coastal Environment Project.
	<p>Follow-up climate change:</p> <ol style="list-style-type: none"> 1. Follow-up to the leading works for the protection from coastal erosion and protecting the city of Nouakchott from sea level rise and sand encroachment. 2. The inclusion of Risk and natural disaster management in the sectorial policies, 3. Provide the entities concerned by appropriate means to confront issues such as immigration and climate change, and also provide them with renewable energy programs as well as efficiency and power control. <p>Total operating factors mentioned above occupies a central place in the priority themes for the Rio Summit in 2012, which are green economy in the context of poverty eradication and good governance for sustainable development.</p> <p>References for verification :</p> <p>Note: The basic documents attached to the text</p>
<p>PC. 4.2. Water-related Hazards</p> <p>Target:</p> <p>Establish at least 1 Early warning System for disaster prevention at national level by 2015.</p>	<p>Specific actions taken so far for the milestone (water disaster prevention initiatives):</p> <p>Existence of Early Warning Disaster prevention System and Year of establishment:</p> <p>Mauritania, like other countries, has included disaster management, in overall sustainable development policy.</p> <p>Map of fragile and at risk areas in Mauritania extends to include the Atlantic coastal axis on the Senegal river that interferes and branch from Nouakchott axis. City Tintane is a good example of this and shows how a city can become a partially moist area.</p> <p>Unfortunately, until now, security measures taken is subsequent to the event and when is need it rather than being procedures and policies for risks and disasters avoidance. This sectorial management to prevent acts of interference and reduce the effectiveness of the risk and disasters management policy. These policies are closely linked to measures prepare an emergency plan that includes security and preventive aspect.</p>
	<p>Adapting with climate change:</p> <p>Desertification, agricultural, animal and low productivity.</p> <p>The most obvious climatic changes phenomena in Mauritania is desertification and its consequences. In fact, the disappearance of plants lead to the sand movement and coarse lands according to the nature of textures.</p> <p>The negative effects of climate change (Climate susceptibility) on water resources is linked to agricultural productivity change, shrinkage in areas of pasture and increased competition over natural resources.</p> <p>With respect to production systems, the most fragile are those that depend on rainfed agriculture and harvest of non-timber forest products, on the other hand, the animal fragility linked to the lack of drinking water, and their impact first appears on the cattle, Valognam then goats, and finally to camels.</p> <p>According to the negative effects of the drought, profound changes to production systems appearing in decline in pastoral systems practiced transhumance widely (Camels and sheep) in favor of bets on animals more associated with urban habitaion (like cattle and goats). This has led to the safe pastoral based on agriculture and livestock also encouraged individual and property settlement and dependence on animal species that are used as a guide.</p>

High water temperature and changing the marine and coastal ecosystems.

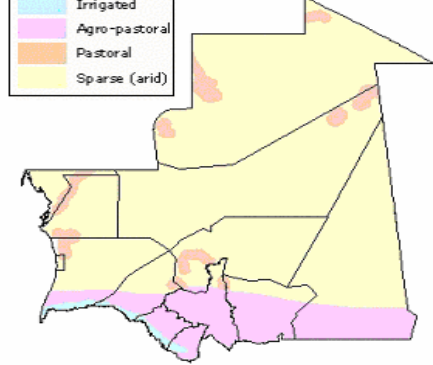
Sea temperature rise, due to climatic changes, has tremendous results on the composition of marine ecosystems and coastal organisms. So, the marine organisms, which are originally sea creatures, may replace some coastal organisms, and so, for example.

In general, global warming will change the life cycle of some races as well as their own environment will result in their disappearance. Fisheries and fish resources will suffer, which represent today more than 12.5% of the national GDP, from damage caused by climate change through some races and environment disorder. It may be translated in the form of economic growth collapse, a big loss in foreign currency (exports) and unemployment rate increase.

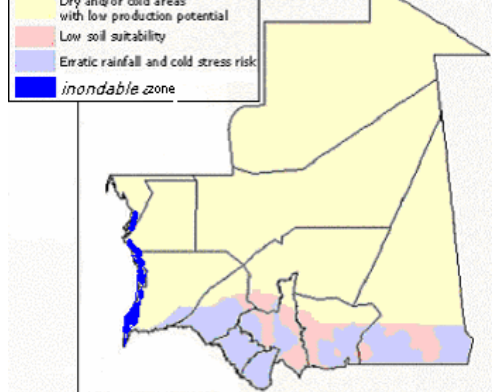
MAURITANIA - Severity of Human Induced Soil Degradation



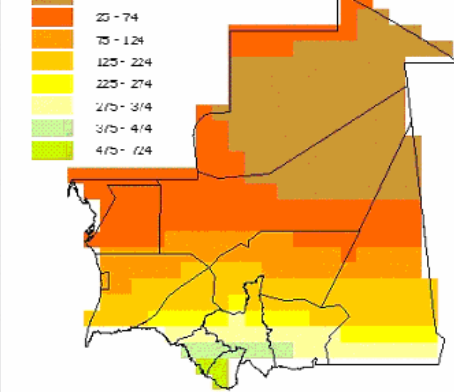
Farming Systems



Environmental Constraints



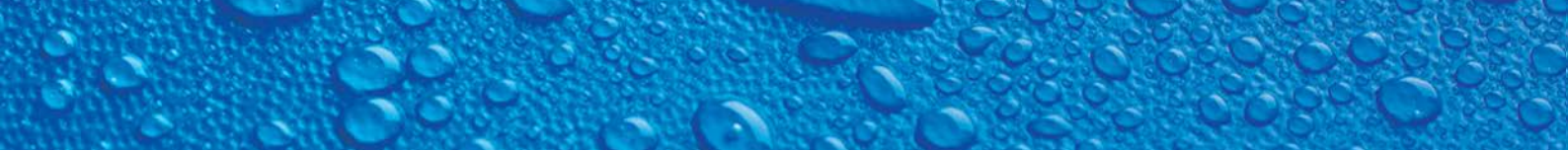
Precipitation Ave mm/year



	<p><u>2.2 The development of deterioration factors</u></p> <p><u>2.2.1. Natural factors</u></p> <p>These factors are mainly climatic factors. The climate risk that occurred from the beginning of the seventies one of the main causes of desertification. This kind of factors is devastating because it happens randomly and Mauritania has no control over it. We recall among these factors:</p> <ul style="list-style-type: none"> - Sparse rainfall. - Broad change in rainfall rate both spatially and chronologically. - Rainfall intensity is the main source of natural deterioration of the soil and it has an increasing rate due to the shrinkage of green cover. - Rising temperatures due to the evaporation issue that happens increasingly. - Hermtan harmful hot winds especially on the surface water, soil moisture, plant sate, the accumulation of sand and wind dynamic. <p>Pollution due to hydrocarbons is caused by the dumping of used oil, gas leaks and oil from wreckage tankers in (in Nouadhibou). The exploration and extraction of oil operations at sea are potential sources of pollution due to hydrocarbons. The sustainable development of the emerging hydrocarbon sector should not only be carried out with respect toward the actors involved to ensure his plan for environmental management, which result from a study of the environmental impacts of their projects. In Mauritania, the accidental pollution at sea could have effects in the sub-region. Indeed, coastal drift (main currents) is heading to the north-south, and leaks in the north of Mauritania (Cape White) will reflect rapidly on the Arguin Bay, and the leaks in the South will undoubtedly affect the economic services of marine ecosystems in the neighboring countries.</p>
<p>PC. 5.1. Institutional arrangements</p> <p>PC. 5.2. Ethics, transparency, empowerment</p> <p>PC. 5.3. Public and private roles</p> <p>PC. 5.4. Right to water</p> <p>PC. 5.5. Regulatory approaches</p>	<p>Specific actions taken so far for the milestone:</p> <p>Existence of policies and reforms of the water, and when the last update:</p> <p><u>Environmental legislation and regulations Elements:</u></p> <p>Water Code (Resolution No. 144-85 issued on the fourth of July 1986 and was amended and repealed by Law No. 30-2005 on the second of February 2005 on Water Code) which defines some basic principles, including, in particular, the investor in irrigated areas with responsibility regard to the rational use of water;</p> <p>Resolution No. 289-87 issued on October 20 / October 1986, which sets new terms of competence , including infrastructure and water management;</p>
<p><u>Target:</u></p> <p>Institute/update, by 2015, water sector policy reforms that reflect good governance principles of:</p>	<p>Article No. 124-93 issued in December 21 / December 1993, which defines the terms of management and exploitation concession for equipment supply of potable water</p> <p>Law No. 016-98 Issued in July 9, 1998 the private participatory management of oases;</p> <p>Article No. 2008-0187 / PM Issued in 20 first / October 2008 and defines the authority of the Ministry of Water and Sanitation, and the Organization of the central administration;</p> <p>Article No. 19-2002 issued in March 31 / March 2002, which recognized the usefulness of public facilities of the National Agency of safe drinking water and sanitation, and set its tax and customs, as well as article 2010, which established the National Office for water services in the rural areas;</p> <p>Article No. 20-2002 of 31 March / March 2002, which applied the fee of water withdrawal.</p>

<p>(i) Partnership commitment; (ii) ethics -transparency, equity and fairness; (iii) responsibility and accountability; (iv) inclusiveness, participation, predictability and responsiveness; and (v) coherence.</p>	<p><i>It seems that we are moving towards a future where allocations between the various water usages are optimized economically and the available water resources are used with an integrated manner. The principles and frameworks of management must ensure a transformation towards a sustainable and equitable solution for everyone.</i></p> <p><i>The long-term strategic study of the water sector in Tunisia is based on the prediction of the resources for future mobilization projects and on the evolution of the demand for some socio-economic indicators...</i></p>
<p>Target:</p> <p>Establish at least 1 Early warning System for disaster prevention at national level by 2015.</p>	<p>Existence of Early Warning Disaster prevention System and Year of establishment:</p> <p><i>For the prevention and management of flood risks, the DGRE has put in place in 2008, a system to collect hydrological measurements in real time and announcements of flood in Tunisian wadis (SYCOHTRAC). This system allows the acquisition, collection, processing and dissemination of information in real time, enabling a quick decision during heavy rainfall and floods. It is a network of operational alert for a good understanding of climatic events, providing early warnings for the protection of property and persons against the devastating effects of extreme events. It includes : (i) a network of 130 automatic observation stations for measuring rainfall and water levels in wadis and dams, powered by solar panels. It is equipped with data acquisition system that stores collected information and transmitting the information via (GSM) modules with capture, storage</i></p>
	<p><i>and transmission of data through the network mobile (GSM) (ii) eleven call centers and data retrieval based on the DGRE, DGBGTH, and the CRDA (iii) and a computer system (WINMONI) for managing the stations, alarming and gathering and validating the data in the data base SYCOHTRAC. The SYCOHTRAC is also a tool for decision support that allows the consultation and data visualization in real time. A software program (PHy) (rainfall, Hydrometry) allows the access to the database through the WEB technology via the intranet network (AGRINET) of MA allowing operators and decision-maker to: (i) check the database under tabular and / or graphical forms, (ii) editing the rainfall or hydrological sheets, (iii) and take immediate and adequate decisions.</i></p>
	<p><i>In addition, the AMU countries have established a Maghreb observatory for the drought, which is a part of the drought early warning system (SMAS) project. The objectives are: the prevention of environmental degradation caused by drought, improving the diagnosis capabilities of the drought crisis and the development of adaptation strategies to reduce the impact of drought using an early warning system (EWS) allowing a regular monitoring of environmental change in the Maghreb countries, and strengthening institutional ability for early warning and drought risk management. The expected results are: (i) the production of indicators of structural and economic vulnerabilities in each country, (ii) the development of structural vulnerability maps, (iii) the integration of EWS products in development plans, (iv) and spreading of EWS products on the Web. The current monitoring tools for measuring the drought impacts, in Tunisia are: (i) meteorological indicators (compared to normal, deciles, or standard precipitation index SPI, reflecting periods of deficit and excess rainfall), agronomic indicators, socio-economic indicators, hydrological, ecological, and socio-economic (ii) remote sensing, (iii) and climate forecasts.</i></p>
	<p><i>Similarly, the DHMPE of the Ministry of Health is also working very hard at the prevention and management of health risks associated with water and the environment in case of natural disasters. Regarding the monitoring of the state of drought in different meteorological stations in the country, INM develops cards of Standard Precipitation Index (SPI); the mapping of this index shows the areas that are affected by drought.</i></p>
	<p><u>-Elements of risk knowledge are:</u> Sectoral studies, documents and guides exist as guide of the sustainable management of water resources, drought guide, and management of extreme climate change. They clarify the risks and provide appropriate responses and mitigation strategies to address a specific risk. Observation networks and monitoring of specific indicators and early warning systems help to know the risks.</p>
	<p><u>- Elements of the Monitoring, analysis and prediction of risks:</u> Monitoring, analysis and forecasts of the risks are conducted with a monitoring and information system.</p> <p><u>-Elements of the Communication or dissemination of alerts and warnings:</u> Alerts and warnings are communicated or distributed according to an agreed communication strategy on risk management. All channels of monitoring and information can be used.</p>

	<p><u>-Elements of local capacity to respond to the warnings received:</u> There are emergency plans and supporting infrastructure at multiple levels.</p> <p><u>-Sources of verification and specific comments:</u> national committee to fight against natural disasters and rescue organization and the regional committees in each governorate.</p>
<p>PC. 5.1. Institutional arrangements</p> <p>PC. 5.2. Ethics, transparency, empowerment</p>	<p>Specific actions taken so far for the milestone:</p> <p>- Restructuring of BPHE, revision of the Water Code, establishment of the national Water Council ,workshop to launch and implement the development project of SINEAU (26/03/2013) ,national consultation workshop on the review and analysis of the state of implementation of strategies and / or action plans for wastewater in Tunisia (05/03/2013), water table on the water local management (25/12/2013), local governance legal framework of water in Tunisia (27/05/2014),consultation workshop on governance and financing of water sector (18/02/2014) ...</p>
<p>PC. 5.3. Public and private roles</p> <p>PC. 5.4. Right to water</p> <p>PC. 5.5. Regulatory approaches</p>	<p>Existence of policies and reforms of the water, and when the last update: in reference to the following documents:</p> <p>-WATER 21 - Study of the water sector in Tunisia long-term 2030 (MARH 1998)</p> <p>- PISEAU project 1 (2001-2007) followed by PISEAU 2 (2008-2014)</p> <p>- Study of the sustainable management of water resources (2008)</p> <p>- Revision and amendment of the Water Code. Bill revising and implementing decrees (2010-2014)</p> <p>- Water Rights in the new constitution (Article 44) (2014)</p>
<p><u>Target:</u></p> <p>Institute/update, by 2015, water sector policy reforms that reflect good governance principles of:</p>	<p>-Existence of Water sector policy that reflects good governance principles, and Year of latest update:</p> <p>-The study of the water sector (1998) established the future strategic direction of the sector and laid the basis and the foundations of integrated water resources management (IWRM)</p> <p>The study recommends an integrated approach for the management of water resources and taking into consideration at the same time the management of groundwater and surface water, the management of the quantity and quality of water and the balanced participation between state and users. In addition, it recommends that while pursuing the mobilization of new water resources, a strategy of “demand management” should be conducted in order to reduce losses and protect the quality of water resources, improve the socio-economic effects for the use of water and to minimize environmental damage.</p>
<p>(i) Partnership commitment;</p> <p>(ii) ethics -transparency, equity and fairness; (iii) responsibility and accountability;</p> <p>(iv) inclusiveness, participation, predictability and responsiveness; and (v) coherence.</p>	<p>Elements institutional preparations:</p> <p>- Ministry of Water and Sanitation which is associated with:</p> <p>Water management,</p> <p>Sanitation management,</p> <p>Hydrology and dam management,</p> <p>Programming, follow-up and cooperation management,</p> <p>Administrative and Financial Affairs management,</p> <p>The National Water Company, a national company with public captial tasked with the production, transfer and distribution of water services in major urban centers (24),</p> <p>National cell of the Senegal River Basin Development Organization (Mauritania),</p> <p>The National Office for Water Services in Rural Areas, which replaced the National Agency for Safe Drinking Water and Sanitation,</p> <p>National Center for Water Resources,</p> <p>National Drilling Company,</p> <p>National Sanitation Office</p>



	<p><i>B. Other departments and, national players in the water sector in Mauritania:</i></p> <p><i>Other departments and national players intervene in the water sector. Among the key players, in particular, are the following parties:</i></p> <ul style="list-style-type: none"><i>- The Ministry of Economic Affairs and Development, which searches for sources of financing and manages the debt service of state-funded work programs and projects in water and sanitation. In addition, the ministry also carries out important water programs, by way of the Mauritania Agency for Public Services, and the agency responsible for enhancing access to organized services on a global scale;</i><i>- A multi-sectoral regulatory body that ensures the regulation of the sector, as well as enforcing legal texts and ensuring the effective development of the sector, it also creates a legal context that contributes to the emergence of organizers at the private level in water, electricity and remote telecommunications sectors. Moreover, it allows the agency to improve access to organized services on a global scale by organizing the water sector in rural and semi-urban areas;</i> <p><i>Municipalities are big players in the sector, and help achieve water projects based on private funds or through decentralized cooperation.</i></p> <p><i>They are also responsible for water quality and specialize in the field of environment, with regards to sanitation;</i></p> <p><i>Food Security Commission:</i></p> <p><i>The Humanitarian Action and Human Rights Commission, as well as civil society, sometimes call for the availability of potable water to disadvantaged class (Lihada project, for example). The time has come for the Commission of Human Rights, Fighting Poverty and Integration to play its part through the training and employment of unemployed citizens, who hold a certificate qualifying them for the management of the springs in the surrounding areas of Nouakchott.</i></p>
	<p><i>-Existence of a policy for the water sector reflect the principles of good governance and the year of updating:</i></p> <p><i>In 2000 the Islamic Republic of Mauritania adopted the “Millennium” Declaration and committed to “reducing the proportion of the population deprived of the ability to regularly access safe drinking water and sanitation by half, by the year 2015”.</i></p> <p><i>In 2001, an anti-poverty strategic framework was set as a reference for the strategic directions for different sectors, including the water sector, with the adoption of a strategy for access to basic services at the global level and across multiple sectors, in order to implement several mechanisms that will ensure a better and more effective contribution by the state in the area of investment.</i></p> <p><i>This strategic framework has been updated and includes the period between 2006-2010 and 2011-2015.</i></p> <p><i>Since 2005, the various players involved in the water sector have been consulted in order to ensure the best appearance for the sector and to strengthen coordination. A review of the sector in rural areas was organized, at the sector level, in June 2005 and was followed by a round table of donor countries in 2006 in order to mobilize financial resources for achieving the Millennium Development Goals. In 2007, a public expenditure review of the sector was held, and the first session of the National Water Council, which was formed in accordance with the Water Code, was held in 2009.</i></p>

	<p><i>This has made the development of the sector and the obligations of the government of the history of “the development of the water sector and cleansing strategy” imperative. The current strategy directs the government’s work towards the water and sanitation sector while following its strategic axes, according to the plan of action that will be implemented. It deals with improving the management of the sector and the development of integrated water resources management and access to safe drinking water and sanitation.</i></p> <p><i>It should be noted that there are a number of achievements in the field of good governance, including, in particular: (1) the establishment of the constitutional institutions and operating them normally; (2) the presidential, legislative and local elections for diversity and transparent organization; (3) political parties working normally; (4) solving the lack of human resources following the events of 1989 and organizing the return of the citizens of Mauritania who had been displaced outside the national borders after these events and their re-integration into society; (5) the adoption of the law criminalizing slavery and suppressing such practices with the implementation of the program to eradicate the legacy of slavery; (6) resuming the drafting of laws and increasing the work put into the justice sector; (7) the establishment of the National Commission for Human Rights; (8) increasing the capabilities of the parliament and the creation of a Supreme Court of justice; (9) the launching of an operation to improve governmental functioning and enhance human resources and electronic dissemination to assess the administrative procedures and gates of public services, as well as the the information management program; (10) de-centralized business regulators, financial controllers and accountants at all central and regional entities; (11) reinforcing of human resources and means of censorship; (12) organizing multiple awareness campaigns against poor management and corruption, and the adoption of a national anti-corruption strategy; (13) adopting a de-centralization and development policy in April 2010; (14) the issuance of the guidance law on land reclamation, and the drafting of legal documents regarding land reclamation in addition to the development of structures stipulated by the law, especially the National Observatory Land Reclamation; (15) Strengthening the capabilities of the civil society,</i></p> <p><i>Elements of partnership and commitment:</i></p>
	<p><i>Elements of partnership and commitment:</i></p> <p><i>(1) the establishment of the constitutional institutions and operating them normally; (2) holding presidential, legislative and local elections for diversity and transparent organization; (3) political parties working normally; (4) solving the lack of human resources following the events of 1989 and organizing the return of the citizens of Mauritania who had been displaced outside the national borders after these events and their re-integration into society;</i></p> <p><i>Elements of ethics-transparency, equality and justice:</i></p> <p><i>(5) the adoption of the law criminalizing slavery and suppressing such practices with the implementation of the program to eradicate the legacy of slavery; (6) resuming the drafting of laws and increasing the work put into the justice sector; (7) the establishment of the National Commission for Human Rights; (8) increasing the capabilities of the parliament and the creation of a Supreme Court of justice; (9) the launching of an operation to improve governmental functioning and enhance human resources and electronic dissemination, to assess the administrative procedures and gates of public services, as well as the the information management program;</i></p> <p><i>Elements on inclusion and participation, estimates and the ability to respond:</i></p> <p><i>(1) adopting a de-centralization and development policy in April 2010; (2) the issuance of the guidance law on land reclamation, and the drafting of legal documents regarding land reclamation in addition to the development of structures stipulated by the law, especially the National Observatory Land Reclamation;</i></p> <p><i>Elements of coherence:</i></p>

<p>PC. 6.1. Financing Local Authorities</p> <p>Targets:</p> <p>-Allocate immediately at least 0.5 % of GDP to sanitation & hygiene.</p> <p>and</p> <p>-Allocate immediately 5% of national budget for water & sanitation.</p>	<p>Specific actions taken so far for the milestone:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> </tr> </thead> <tbody> <tr> <td>- GDP (A₁)</td> <td>969728106</td> <td>1050441106</td> <td>1013462104</td> <td>1201355104</td> <td>1206702104</td> </tr> <tr> <td>- Sanitation and Hygiene Budget (B₁)</td> <td>141306480</td> <td>276032847</td> <td>781032847</td> <td>661032847</td> <td>795203452</td> </tr> <tr> <td>Percentage of GDP for Sanitation and Hygiene gdpSH (%) = B₁/A₁</td> <td>0.014571764</td> <td>0.026277806</td> <td>0.077065825</td> <td>0.055023939</td> <td>0.065898909</td> </tr> </tbody> </table> <p>Adopting a sanitation program in rural areas:</p> <p>Achievement for GDP allocation:</p> <p>Achievement for national budget allocation:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> </tr> </thead> <tbody> <tr> <td>- Total National Budget (A₂)</td> <td>275110020420</td> <td>233856407550</td> <td>250366154199</td> <td>269153400000</td> <td>346281814020</td> </tr> <tr> <td>- Water and Sanitation Budget (B₂)</td> <td>5329311802</td> <td>8217948907</td> <td>6487640329</td> <td>3647868690</td> <td>3845489258</td> </tr> <tr> <td>Percentage of national Budget to Water and Sanitation BdgWS (%) = B₂/A₂</td> <td>1.937</td> <td>3.514</td> <td>2.4914072</td> <td>1.3553121</td> <td>10.1</td> </tr> </tbody> </table>	Years (i)	2008	2009	2010	2011	2012	- GDP (A ₁)	969728106	1050441106	1013462104	1201355104	1206702104	- Sanitation and Hygiene Budget (B ₁)	141306480	276032847	781032847	661032847	795203452	Percentage of GDP for Sanitation and Hygiene gdpSH (%) = B₁/A₁	0.014571764	0.026277806	0.077065825	0.055023939	0.065898909	Years (i)	2008	2009	2010	2011	2012	- Total National Budget (A ₂)	275110020420	233856407550	250366154199	269153400000	346281814020	- Water and Sanitation Budget (B ₂)	5329311802	8217948907	6487640329	3647868690	3845489258	Percentage of national Budget to Water and Sanitation BdgWS (%) = B₂/A₂	1.937	3.514	2.4914072	1.3553121	10.1
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<p>PC. 6.2. Pricing Strategies</p> <p>PC. 6.3. Pro-poor financing Strategies</p>	<p>Specific actions taken so far for the milestone:</p> <p>Describe the Water Tariff Structure:</p> <p>These criteria vary according to the level of social and economic development of the target areas is as follows:</p> <p>Villages (from 150 to 500): 20 liters/ person/ day.</p> <p>Rural centers (500 individual citizen to 1000): 20 liters/ person/ day.</p> <p>Semi-urban centers (from 100 to 5,000): 30 liters/ person/ day.</p> <p>Urban centers (which outnumber the local population of 5,000): 45 liters/ person/ day</p> <p>Pricing</p> <p>Table 12: The current prices for water according to the organizers:</p> <table border="1"> <thead> <tr> <th>Organizer</th> <th>National Water Company</th> <th>National institute for rural water services</th> <th>Agent</th> <th>Others</th> </tr> </thead> <tbody> <tr> <td>The price UM/m³</td> <td>From 99 to 367</td> <td>From 100 to 260</td> <td>From 168-300 to 800</td> <td>From 70 to 500</td> </tr> </tbody> </table> <p>Minimum vital (liters / person / day): 20 liter</p> <p>The minimum income (the local currency-UM): 30000 UM</p> <p>Rate (euro / local currency) 1 euro per 400 UM</p>	Organizer	National Water Company	National institute for rural water services	Agent	Others	The price UM/m ³	From 99 to 367	From 100 to 260	From 168-300 to 800	From 70 to 500																																						
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<p>Target:</p> <p>Set by 2015, water tariff system that addresses cross-subsidy and the need of poor.</p>	<p>Tariff Structure:</p> <p>The National water company</p> <table border="1"> <thead> <tr> <th>Consumption categories (m³)</th> <th>Rate (local currency)</th> </tr> </thead> <tbody> <tr> <td>20></td> <td>99 UM/m³</td> </tr> <tr> <td>20<</td> <td>367 UM/m³</td> </tr> <tr> <td>Taxes</td> <td>6 UM/m³</td> </tr> </tbody> </table> <p>Tariff for rural areas and urban centers <5000 citizen</p> <p>- Water Services National Office in the countryside</p> <p>Solar power stations: 120 UM / L</p>	Consumption categories (m ³)	Rate (local currency)	20>	99 UM/m ³	20<	367 UM/m ³	Taxes	6 UM/m ³																																								
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	<p>Price is not specified for thermal stations and the price varies according to the cost of exploitation between 100 UM / m³ and 260 UM / m³.</p> <p>Agent 168 UM / m³-300 UM / m³ and up to 800 UM / m³ according to the cost of consumption</p> <p>Other (municipalities)</p> <p>From 70 UM / m³ to 500 UM / m³ according to the cost of exploitation.</p> <p>Description of Sanitation services pricing, if any:</p> <p>The Fee for the sanitation network is only collected by nation water company with price upto 14 UM / m³.</p> <p>Sources verification and observations:</p> <p>- National Company for water and water services to the national office in the countryside and the organization.</p>															
<p>PC. 7.1. Education and capacity development</p> <p><u>Target:</u></p> <p>To be identified.</p>	Not to be reported.															
<p>PC. 7.2. Information</p> <p><u>Target:</u></p> <p>Enhance by 2016, the national water and sanitation Monitoring, Evaluation and Reporting (M&E, &R) Systems in a way to be in line with the pan African M&E.</p>	<p>Specific actions taken so far for the milestone:</p> <p>The existence national system for monitoring, evaluation and reporting of water and sanitation, and year of implementation. Existence of a data base for groundwater and the associated geographic information system which is administered by the National Center for Water Resources since 1998 for water management, and transfer of the National Center for Water Resources in 2001, in addition to the groundwater monitoring system through fluid pressure units that have been established in 18 fields. These fields includes systems for assembling groundwater, including 14 field feeds some of the major cities in Mauritania, 4 units were put also in the field, which includes groundwater collection systems in an oasis Ordar and field Tasiast and National Company for industry and mining field and the field of the Senegal River Basin Development Organization in Mauritania. Database at the national water company management level and the National Office for water services in the rural areas. The existence of a special database of hydrological measurement unit for the main water streams, and run by the department rural land management in addition to measuring stations on Senegal River. Monitoring mechanism for the major water conservatories (Dyadma, Foam, Geleta, Tamurt Naji).The existence of monitoring system and agricultural, water, aerial information system helps in the development of rain-fed agriculture which is managed by sanitation department. Availability of monitoring network via fluid pressure measurement units in the valley of the Senegal River. Availability of monitoring network of surface waters, and agricultural land management department has database for dams in form of Excel sheets in addition to measuring stations along the Senegal River.</p> <p>The latest updates in the M&E system:</p> <table border="1"> <thead> <tr> <th>Criteria</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>Newly integrated elements</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> </tr> <tr> <td>Motives</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> </tr> </tbody> </table>	Criteria	Year 1	Year 2	Year 3	2011	Newly integrated elements	---	---	---	---	Motives	---	---	---	---
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<p>PC. 7.3. Water and Technologies</p> <p><u>Target:</u></p> <p>To be identified.</p>	Not to be reported.															
<p>PC. 7.4. Professional Networks/ Associations</p> <p><u>Target:</u></p> <p>To be identified.</p>	<ul style="list-style-type: none"> Not to be reported. 															

Tunisia AMCOW Pan African M&E Performance Sheet

Country Background Information Sheet

Country Name: **Tunisia**

Items	Information					
1. Population trends for the last 4 years, and GDP.	Years	2000	2010	2011	2012	2013
	Urban pop.	5979900	6971600	7055400	7156145*	7241575*
	Rural pop.	3572600	3575500	3618400	3621408*	3644952*
	Total pop.	9552500	10547100	10673800	10777553*	10886527*
	GDP (10⁹ USD)	18.45468	39.77751	40.58608-	44.25654**	47.43029***
Source : INS (* pop on 1st July, **semi-final, *** provisional); 1DT=0.627 USD on 27/3/2013.						
2. Basis of the existing water sector Policy/ Reform and potential policy targets.	<i>Important issues addressed in the existing Water Sector Reform? Public policy of water in Tunisia was established based on the following strategic objectives: (i) ensure the supply of drinking water to all inhabitants (ii) develop tourism and ensure food security of the country by restricting imports of food and agricultural products and by encouraging the export (iii) stabilize rural incomes. Actually other objectives are added such as improving the efficiency of irrigation systems ensuring better use of water resources. Thus the objective sought by the state is that the share of irrigated agriculture in the national production passes from 35% to 50%. These policies have gone through two major steps that led to a switch from a policy based on the sustained mobilization of water resources in order to improve the supply, to a policy of management and valorization of these water resources in order to manage the global demand. Meanwhile the focus is more on finding unconventional resources. This research includes: (i) the reuse of treated wastewater, and to a certain extent, desalination of brackish and saline water, (ii) and integrated water resources management (IWRM).</i>					
	<i>The objectives of the new water policy in Tunisia seek to: (i) ensure continuing suitability between needs and water resources by increasing supply and controlling of the demand, (ii) identify imbalances at the scale of natural regions of the country (iii) consider ways to readjust imbalances in the context of integrated management. This evolving policy hasn't ceased to be modernized and completed to address key issues and resulted in the development of national or sector strategies and action plans and programs to implement these strategies.</i>					
	<i>Major reforms in the water sector and sanitation: BPEH restructuring, revision of the Water Code, Renaissance of the National Council of water, review of legal, regulatory and contractual hydraulic groups framework, review of the Tunisian standard NT09-14 on the quality of drinking water; revision of the NT106-03 on the reuse of treated wastewater; workshop to launch the project development and implementation of SINEAU (26/03/2013), national Consultation Workshop on the review and analysis of the state of implementation strategies and / or action plans for wastewater in Tunisia (05/03/2013), water table on the water local management (25/12/2013), local governance legal framework of water in Tunisia (27/05/2014), consultation workshop on governance and financing of water sector (18/02/2014) ...</i>					
	<i>Main potential targets by 2016: (i) mobilization of 95% of water resources, (ii) the irrigated area using water-saving equipment reaches 93% (iii) 90% of the cost of water for irrigation systems and rural water supply is recovered (iv) efficiency rate of the parcel irrigated is 78%(v) accessibility to drinking water in rural areas is 98%</i>					

<p>3. Knowledge of international and African Milestones on Water and Sanitation.</p>	<p><u>Which are the ones well known and used in the county? Specify how it is used-</u> <i>-The Millennium Development Goals (MDGs) adopted by the General Assembly of the United Nations (UN) in 2000, who declared the decade 2005-2015 as the Decade of Water for Life, target international goals in the sector of water and the environment. Goal 7 aims to preserve the environment, and by 2015, the percentage of the population that does not have sustainable access to safe drinking water or to sanitation will be reduced to half its value now (target 7c). The rates achieved by the country in terms of water supply and sanitation are as follows: Accessibility to drinking water is 100% in urban areas and 93.9% in rural areas. For sanitation, the rate of access is 99% in urban areas and 84% in rural areas, which reflects the significant efforts made in this area.</i></p>															
	<p><i>-The shared African water vision 2025 aims that Africa have equitable and sustainable management of water resources for poverty alleviation, socio-economic development, regional cooperation and the preservation of the environment. The realization of this vision depends on four axes: (i) strengthening the governance of water resources, (ii) improving the efficiency of water usage (iii) meeting the urgent needs for water, (iv) strengthening financing of water in the future. These areas are broken down into 12 targets. For example, for axis 3 target 1, the African vision plans to reduce by 25% in 2005 and 75% by 2015 the proportion of people without access to safe drinking water and sanitation. The rate of inaccessibility to water and sanitation in Tunisia in 2013 was reduced respectively by 91.9% and 77.8% and are therefore in line with the objectives of the African Water Vision 2025. The efforts performed by Tunisia for the achievement of the vision targets meet the objectives in general.</i></p>															
	<p><i>-Sharm Elsheikh commitments to accelerate the achievement of water and sanitation in Africa, signed by the Heads of State and Government of the African Union, on the occasion of the 11th Ordinary Session of conference in Sharm Elsheikh, Egypt, from 30 June to 1 July 2008, these commitments are also considered for the monitoring of the progress to achieve the various targets.</i></p>															
<p>4. Trend of the 3 latest reviews in national water Policy and Reforms.</p>	<table border="1"> <thead> <tr> <th>Reviews</th> <th>Review 1</th> <th>Review 2</th> <th>Review 3</th> </tr> </thead> <tbody> <tr> <td>Drivers of the Reviews</td> <td>WATER - 21; Study of the water sector in Tunisia long term 2030 (MARH 1998)</td> <td>The project PISEAU 1 (2007-2001)</td> <td>- The project PISEAU 2 (2008-2014) - study of the sustainable management of water resources (2008)</td> </tr> <tr> <td>Targeted Impacts and effectiveness</td> <td>-Introduction of the IWRM -management of water demand - Use of non-conventional water</td> <td>Improvement of rural water supply - Optimization of monitoring of surface water and groundwater - design of SINEAU</td> <td>-Improvement of governance - Implementation of subsystems S & E and SINEAU - Participative management of groundwater - Pilot operations of rural sanitation -Quality improvement and enhancement of TW - Implementation of SOW M&E&R system - Revision and amendment of the Water Code. Bill revising and implementing decrees (2010-2014) - Water Rights in the new constitution (Article 44) (2014)</td> </tr> </tbody> </table>				Reviews	Review 1	Review 2	Review 3	Drivers of the Reviews	WATER - 21; Study of the water sector in Tunisia long term 2030 (MARH 1998)	The project PISEAU 1 (2007-2001)	- The project PISEAU 2 (2008-2014) - study of the sustainable management of water resources (2008)	Targeted Impacts and effectiveness	-Introduction of the IWRM -management of water demand - Use of non-conventional water	Improvement of rural water supply - Optimization of monitoring of surface water and groundwater - design of SINEAU	-Improvement of governance - Implementation of subsystems S & E and SINEAU - Participative management of groundwater - Pilot operations of rural sanitation -Quality improvement and enhancement of TW - Implementation of SOW M&E&R system - Revision and amendment of the Water Code. Bill revising and implementing decrees (2010-2014) - Water Rights in the new constitution (Article 44) (2014)
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<p>5. Comments on the national water sector regarding the strengths, weaknesses, opportunities, threats and outstanding problems.</p>	<p><i>Water resources of the country are limited. In order to exploit and develop this potential, Tunisia has established the legislative framework and institutions necessary for the realization of ambitious programs on the water sector. It has developed policies, national strategies and action plans for the sustained mobilization, management, protection and enhancement of water resources. The important improvements mobilization, storage, transfer and handling produced water in recent decades, with the development of various sectors of the economy and significantly reduced the vulnerability to the vagaries of climate: water security, mitigation the effect of drought, protection against flooding. Tunisia raised the challenge of mobilizing her water resources to serve the socio-economic development and welfare of its population, so that the Tunisian now has a level of water comfort that has not been matched in the past. Today, Tunisia faces the problems of, effective management, integrated and sustainable conservation, resource protection and enhancement of its maximum, to meet growing demand, future needs and control risks.</i></p>
	<p><i>The sector has achieved remarkable performance in terms of water supply and sanitation with a very positive impact on the quality of life and economic activity. Despite the achievements, the water sector still faces problems that hinder its proper functioning particularly in terms of monitoring and evaluation. Among these problems, we can mention : IWRM is still under development, the water stakeholders are not yet fully involved, ineffective management of groundwater, storm water is not used outside the agriculture sector ,pricing and the mismatch between the price of drinking water production and sales of, the institutional gap for rural sanitation ...</i></p>
	<p><i>Similarly, the national information system on water (SINEAU) offers a dynamic database and a unified system to all sub systems management. However, monitoring and evaluation is still under development, and only some subsystems (SYGREAU, COPEAU) are operational. Also, governance needs to be improved or even enhanced by the introduction and application of the principles of good governance</i></p>

Country Water and Sanitation Performances Evaluation Sheet

Country Name: **Tunisia**

Performance Category	Country Information																																				
<p>Theme 1: Infrastructure of water for economic development. PC. 1.1. Water and Energy Target: Increase the use of hydro-energy by 10% between 2000 and 2015.</p>	<p>-The national theoretical hydropower potential is estimated at 1000 GWh, the theoretical exploitable potential is 250 GWh, the economically feasible is 165 GWh and the installed capacity is currently estimated at 66 MW on a set of eight hydro-electric dams. The hydropower is nearly 1% of the total energy produced by the country.</p> <p>-<u>Specific actions taken to achieve the target:</u> STEG proceeded to achieve the following: (i) renovation and modernization of old hydro power plants by using modern equipment like static excitation, microprocessor based controls, electronic governors, high speed static relays, data logger, vibration monitoring etc; but it is not enough to achieve the target</p>																																				
	<p>Level of achievement</p> <table border="1"> <thead> <tr> <th>years (i)</th> <th>2000</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- Hydroelectric potential economically feasible GWh(P)</td> <td>160</td> <td>165</td> <td>165</td> <td>165</td> <td>165</td> </tr> <tr> <td>-Hydro-electric capacity installed MWh(C)</td> <td>64</td> <td>66</td> <td>66</td> <td>66</td> <td>66</td> </tr> <tr> <td>-Index of the usage of the hydropower ($Hpul = C/P$)</td> <td>0.4</td> <td>0.4</td> <td>0.4</td> <td>0.4</td> <td>0.4</td> </tr> <tr> <td>Growth rate $R_i Hpul(\%) = (Hpul_i - Hpul_{2000})/Hpul_{2000}$</td> <td>-</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>-<u>Sources of verification and specific comments:</u> Annual operating report of STEG Centre for Hydraulics Production which is part of the Department of Renewable Energy Production attached itself to the Central Directorate of Electricity Production. The economically feasible hydropower potential and the installed hydroelectric capacity have not changed since several years. Target will not be achieved in 2015.</p>	years (i)	2000	2010	2011	2012	2013	- Hydroelectric potential economically feasible GWh(P)	160	165	165	165	165	-Hydro-electric capacity installed MWh(C)	64	66	66	66	66	-Index of the usage of the hydropower ($Hpul = C/P$)	0.4	0.4	0.4	0.4	0.4	Growth rate $R_i Hpul(\%) = (Hpul_i - Hpul_{2000})/Hpul_{2000}$	-	0	0	0	0						
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<p>PC. 1.2. Water and Agriculture <u>Targets:</u> -Increase water productivity Rain fed agriculture & Irrigation by 30% from 2000 to 2015. and -Increase the size of irrigated areas by 50% from 2000 to 2015</p>	<p>-<u>Specific actions taken to achieve the target:</u> Improving the efficiency of water use</p> <p>▪ Level of achievement for agricultural productivity:</p> <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Agricultural GDP (10⁹ USD) (A)</td> <td>1.62832</td> <td>3.06728</td> <td>3.42405</td> <td>3.84175</td> <td>3.88802</td> </tr> <tr> <td>-Total water withdrawn for irrigated and rain fed agriculture (10⁹ m³)(B)</td> <td>6.040 (1.879*+ 4.161**)</td> <td>8.634 (2.203*+ 6.431**)</td> <td>9.310 (2.210*+ 7.100**)</td> <td>6.279 (2.247*+ 4.032**)</td> <td>8.373 (2.313*+ 6.060**)</td> </tr> <tr> <td>-Water Return to Environment 10⁹ m³ (C)</td> <td>0.133</td> <td>0.140</td> <td>0.150</td> <td>0.130</td> <td>0.140</td> </tr> <tr> <td>Water productivity (USD/m³) $Wp=A/(B-C)$</td> <td>0.27562</td> <td>0.36111</td> <td>0.37380</td> <td>0.62477</td> <td>0.47224</td> </tr> <tr> <td>Rate of increase $R_i Wp(\%) = (Wp_i - Wp_{2000})/Wp_{2000}$</td> <td>-</td> <td>31.01</td> <td>36.62</td> <td>126.67</td> <td>71.33</td> </tr> </tbody> </table> <p>*Total water withdrawn for irrigated areas: surface water+ groundwater ** Total water withdrawn for rain fed agriculture Water Return to Environment is estimated</p>	Years (i)	2000	2010	2011	2012	2013	-Agricultural GDP (10 ⁹ USD) (A)	1.62832	3.06728	3.42405	3.84175	3.88802	-Total water withdrawn for irrigated and rain fed agriculture (10 ⁹ m ³)(B)	6.040 (1.879*+ 4.161**)	8.634 (2.203*+ 6.431**)	9.310 (2.210*+ 7.100**)	6.279 (2.247*+ 4.032**)	8.373 (2.313*+ 6.060**)	-Water Return to Environment 10 ⁹ m ³ (C)	0.133	0.140	0.150	0.130	0.140	Water productivity (USD/m³) $Wp=A/(B-C)$	0.27562	0.36111	0.37380	0.62477	0.47224	Rate of increase $R_i Wp(\%) = (Wp_i - Wp_{2000})/Wp_{2000}$	-	31.01	36.62	126.67	71.33
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<p>PC. 1.3. Water for multiple Uses</p> <p><u>Target:</u> Increase the Water Demand Satisfaction Index (WDSI) by 10% from 2000 to 2015.</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: ▪ Achievement: <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2000</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- *Total all sectors Water Demand $10^9 m^3$ (A)</td> <td>9.553</td> <td>10.547</td> <td>10.673</td> <td>10.777</td> <td>10.886</td> </tr> <tr> <td>- **Total all sectors water supply (B)</td> <td>10.760</td> <td>15.027</td> <td>16.334</td> <td>10.608</td> <td>14.488</td> </tr> <tr> <td>- WDSI = B/A</td> <td>1.126</td> <td>1.424</td> <td>1.530</td> <td>0.984</td> <td>1.331</td> </tr> <tr> <td>Rate of increase $R_i WDSI (\%) = (WDSI_i - WDSI_{2000}) / WDSI_{2000}$</td> <td>-</td> <td>26.4</td> <td>35.8</td> <td>-12.6</td> <td>18.2</td> </tr> </tbody> </table> <p>* Value is calculated based on 1000 m3/capita/yr as per AMCOW guidelines ** Values include blue, green, grey, and silver waters Target is met but is highly controlled by the fluctuation in green water. Also, the 1000 m3/capita/yr might not be realistic for Tunisia</p>	Years (i)	2000	2010	2011	2012	2013	- *Total all sectors Water Demand $10^9 m^3$ (A)	9.553	10.547	10.673	10.777	10.886	- **Total all sectors water supply (B)	10.760	15.027	16.334	10.608	14.488	- WDSI = B/A	1.126	1.424	1.530	0.984	1.331	Rate of increase $R_i WDSI (\%) = (WDSI_i - WDSI_{2000}) / WDSI_{2000}$	-	26.4	35.8	-12.6	18.2
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	<ul style="list-style-type: none"> ▪ Sources of verification: Surface water abstraction from dams (DGBGTH), pumping from rivers (wadis) (BIRH) groundwater abstraction from deep aquifers (DGRE), precipitation intercepted by rain fed (estimated), use of treated waste water (ONAS, DGGREE), use of desalinated water (SONEDE and private users), use of rainwater tanks-majels (INS). 																														
<p>Theme 2: Management and protection of water resources</p> <p>PC. 2.1: Transboundary basins and water resources management</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: Establishment of a consultative mechanism for the joint management of the North Western Sahara Aquifer System(NWSAS), operated by Tunisia, Algeria and Libya ▪ Existence of a Management Plan for Effective Water or IWRM plan and year of adoption: - There is no stated plan for the Integrated Water Resources Management; however the main institutions responsible for water work separately for the promotion of IWRM through its various components, as well as improving governance and effective management of water resources. - A national plan for Integrated Water Resources Management at the national level and across borders, which identifies priority steps that must be taken to reform the system of water management to the principles of IWRM to develop by 2015. 																														
<p><u>Target:</u> Develop a national Water Efficiency Plan by 2015.</p>	<p>Elements of the legislative and regulatory environment:</p> <ul style="list-style-type: none"> - The water code developed in 1975 is being revised and / or redesigned to update it and to adapt to current conditions. It remains the most appropriate instrument for the preservation and protection of water resources. - The recent Renaissance of the National Council of Water (Decree No. 407/2010 dated March 9, 2010) will assist the Minister to decide on strategic issues in the sector, while involving all stakeholders in the water, including civil society. 																														

	<p><u>Elements of institutional arrangements:</u></p> <ul style="list-style-type: none"> - The BPEH recently renewed and charged by the Minister's office, in coordination with stakeholders in the hydraulic sector, to: (i) planning the mobilization of conventional water resources and the development of non-conventional water resources in order to meet the medium and long term, growing needs of water consumption in different sectors, (ii) annual program allocation of water resources to different users in order to develop such resources, (iii) ensure the ongoing monitoring of deployment of the hydraulic sector especially in emergency situations, which consist mainly in periods of drought or floods or during any failures in any production or distribution water facility, (iv) ensure coordination between institutions producers and distributors of water resources in the hydraulic field. - The BPEH is in charge of coordinating the study of strategic water in 2050 in Tunisia. - DGRE is responsible for the coordination and management of the national information system on water (SINEAU). 																														
	<p><u>Elements of Financial Structure:</u></p> <ul style="list-style-type: none"> - The investment project in water sector (PISEAU 2) is financed by the IBRD, AfDB and AFD. The implementation of SINEAU and the strategic study on Water 2050 are financed by the AWF. The revision of the Water Code is funded by BIRH while preservation strategy groundwater is funded by the European Union. Efficient project management of water resources and the study of the sustainable management of water resources are funded by GIZ. 																														
	<p><u>Management instruments:</u> Existence of tools and methods that help decision makers to take the best decision. These instruments are: the Water Code, the National Council for water, The hydraulic public water domain commission, the National Commission for Sustainable Development, SINEAU, BPEH, and BIRH etc.</p> <p><u>Sources of verification and specific comments:</u> - Ministry in charge of Water and institutions.</p>																														
PC. 2.2. Transboundary Infrastructure Development Rainwater <u>Target:</u> Increase by 10% from 2008- 2015.	<ul style="list-style-type: none"> ▪ Not applicable 																														
PC. 2.3. Groundwater <u>Target:</u> AGC Roadmap implemented at More than 80%.	<ul style="list-style-type: none"> ▪ Not applicable 																														
PC. 2.4. Rainwater <u>Target:</u> Increase the share of rainwater use in total municipal water consumption up to 10% by 2015.	<ul style="list-style-type: none"> ▪ <u>Specific actions taken so far for the milestone:</u> - Encouraging the use of rainwater ▪ Achievement: <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- Total municipal water supply(A)</td> <td>488.8</td> <td>563.7</td> <td>601.3</td> <td>628.7</td> </tr> <tr> <td>- Rainwater use (Mm³) (B)</td> <td>12.6</td> <td>8.76</td> <td>10.20</td> <td>10.7*</td> </tr> <tr> <td>- Water use from other sources (Mm³) (C)</td> <td>(41.7+83.7)</td> <td>(44.0+69.3)</td> <td>(44.4+57.2)</td> <td>(45.0+46.1)</td> </tr> <tr> <td>Total municipal water consumption (%) (T_{wc} = A+B+C)</td> <td>626.8</td> <td>659.7</td> <td>713.1</td> <td>689.0</td> </tr> <tr> <td>Percentage of rainwater use P_{Ru} (%) = B/T_{wc}</td> <td>2.01</td> <td>1.32</td> <td>1.43</td> <td>1.55</td> </tr> </tbody> </table> <p>*estimated at 90 000 families.</p>	Years (i)	2008	2011	2012	2013	- Total municipal water supply(A)	488.8	563.7	601.3	628.7	- Rainwater use (Mm ³) (B)	12.6	8.76	10.20	10.7*	- Water use from other sources (Mm ³) (C)	(41.7+83.7)	(44.0+69.3)	(44.4+57.2)	(45.0+46.1)	Total municipal water consumption (%) (T _{wc} = A+B+C)	626.8	659.7	713.1	689.0	Percentage of rainwater use P_{Ru} (%) = B/T_{wc}	2.01	1.32	1.43	1.55
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Percentage of rainwater use P_{Ru} (%) = B/T_{wc}	2.01	1.32	1.43	1.55																											
	<p><u>Sources of verification and specific comments:</u> -The quantities of water are removed from municipal provided statistical reports SONEDE, storm water are estimated on the basis of the general census of population and housing 2004 and on the results of the Labor Force Survey 2009 of INS; the withdrawals from wells and boreholes come from DGRE directories. -The figures for rainwater used needs to be revised and better defined</p>																														

<p>PC. 3.1. Urban Water Supply</p> <p>PC. 3.2. Urban Sanitation</p> <p>PC. 3.3. Rural Water Supply</p> <p>PC. 3.3. Rural Sanitation and Hygiene</p>	<ul style="list-style-type: none"> Specific actions taken so far for the milestone: <i>Developing Infrastructure of water supply and sanitation in urban and rural areas especially in the North West and in the South regions.</i> Achievement in water supply: <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Urban access (%)</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> </tr> <tr> <td>-Rural access (%)</td> <td>38,7</td> <td>93,5</td> <td>93,8</td> <td>93,4</td> <td>93,9</td> </tr> <tr> <td>-Total access (%) (W)</td> <td>75,4</td> <td>97,8</td> <td>97,9</td> <td>97,8</td> <td>98,0</td> </tr> <tr> <td>Rate of Inaccessibility reduction for water IRwat (%) = $(W_i - W_{1990}) / (100 - W_{1990})$</td> <td>-</td> <td>91.0</td> <td>91.5</td> <td>91.0</td> <td>91.9</td> </tr> </tbody> </table>	Years (i)	1990	2010	2011	2012	2013	-Urban access (%)	100	100	100	100	100	-Rural access (%)	38,7	93,5	93,8	93,4	93,9	-Total access (%) (W)	75,4	97,8	97,9	97,8	98,0	Rate of Inaccessibility reduction for water IRwat (%) = $(W_i - W_{1990}) / (100 - W_{1990})$	-	91.0	91.5	91.0	91.9
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<p>Target: Reduce by 50% from 1990 to 2015, the proportion of the population without improved drinking water source, and the proportion without improved sanitation facility (Urban/Rural / Total).</p>	<ul style="list-style-type: none"> Achievement in improved sanitation: <table border="1"> <thead> <tr> <th>Years (i)</th> <th>1990</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>-Urban access (%)</td> <td>94</td> <td>98 97 (JMP)</td> <td>98</td> <td>98 97 (JMP)</td> <td>99*</td> </tr> <tr> <td>-Rural access (%)</td> <td>43</td> <td>84 77 (JMP)</td> <td>84</td> <td>84 77 (JMP)</td> <td>84*</td> </tr> <tr> <td>-Total access (%) (S)</td> <td>73</td> <td>94 89 (JMP)</td> <td>93.8</td> <td>94 90 (JMP)</td> <td>94*</td> </tr> <tr> <td>Rate of Inaccessibility reduction for sanitation IRsan (%) = $(S_i - S_{1990}) / (100 - S_{1990})$</td> <td>-</td> <td>77.8</td> <td>77.0</td> <td>77.8</td> <td>77.8*</td> </tr> </tbody> </table> <p>2013 figures are estimated Targets are achieved based on national and JMP improved water supply and sanitation definitions</p>	Years (i)	1990	2010	2011	2012	2013	-Urban access (%)	94	98 97 (JMP)	98	98 97 (JMP)	99*	-Rural access (%)	43	84 77 (JMP)	84	84 77 (JMP)	84*	-Total access (%) (S)	73	94 89 (JMP)	93.8	94 90 (JMP)	94*	Rate of Inaccessibility reduction for sanitation IRsan (%) = $(S_i - S_{1990}) / (100 - S_{1990})$	-	77.8	77.0	77.8	77.8*
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	<ul style="list-style-type: none"> Sources of verification : <i>The data sources are: (i) the INS through censuses of 1974, 1984, 1994, 2004 and INS national survey on population and housing for 2009</i> <i>It is recommended to remove the institutional shortcomings of rural sanitation and extend the scope of ONAS rural or load another appropriate institution management, (iii) MDG 2011 report, AfDB, AEC, AU, and UNDP(data of 1990 and 2008), (iv) African Water Report to AU. Summit 31/01/2014 for WHO/UNICEF/JMP data.</i> 																														
<p>PC. 4.1. Adaptation to Climate Change</p>	<ul style="list-style-type: none"> Specific actions taken so far for the milestone (New initiatives to improve resilience): <i>Developing a strategy, action plans and programs for implementation</i> Existence of a National Climate Change Adaptation Strategy and Year of adoption: <i>A national adaptation strategy of Tunisian agriculture and ecosystems to climate change (MARH, 2006) and a study on the protection of ecosystems and adaptation to climate change (ME, 2007), have been developed. This strategy is based on sectoral strategies related to water resources, ecosystems, agro-ecosystems and the agricultural sector as a whole. This strategy was adopted.</i> 																														
<p>Target: Develop and implement, at least 1 Climate Change Adaptation Strategy by 2015.</p>	<ul style="list-style-type: none"> Existence of Actions Plans on Water for Climate Change resilience: <i>Action plans and implementation of this strategy based on: (i) the control of excess water in wet years by the development of surface storage techniques (structural design for a multi-year adjustment) and underground (recharge of ground water), (ii) the future management / risk management, focusing mainly on the mobilization of new resources, optimizing management, water conservation, rationalization and enhancement of water, (iii) and concrete measures for the development of legislation, institutional, and especially the strengthening of modest capacity to adapt to climate change. It is a series of action plans for drought, flooding, water quality, protection of wetlands, coastal management ...</i> 																														

	<ul style="list-style-type: none"> ▪ <u>Existence of Programmes for implementing the Actions plans:</u> Detailed activities programs for the implementation of action plans exist, they are broken down by component: 1) climate: (i) establishment of a monitoring system based on climate and remote sensing early warning to the farm level, (ii) implementation of a System for Collecting Real Time Hydrological measurements and Announcement Flood Tunisian wadis (SYCOHTRAC) (iii) dissemination of information in the form of climate indices in all economic sectors, (iv) conduct a study on the sustainable management of water resources in Tunisia (OTEDD) (v) conduct a study on early warning system for the management of risks to climate extremes and climate change in Tunisia.2) water resources: (i) revise the Water Code and commit to implement it rigorously to protect water resources and taking into consideration the climate change, (ii) further review the water pricing by taking into account the conservation of ecosystem services.3) ecosystems: (i) continue the program of water management - however by ecosystem, rather than by watershed - to take into account the environmental benefits of these services(4) agricultural systems: (i) rigorously enforce the planned agricultural map (use of land and crops) while adapting to future climate change. A system of M & E for adaptation to climate change (case of agriculture) is being implemented by OTEDD.
	<ul style="list-style-type: none"> ▪ <u>Sources of verification and Specific comments:</u> Sources of verification are: (i) for climate: MA, DGRE, INM, OTEDD (ii) for water resources: MA, DGRE, BIRH, SONEDE, DGGREE (iii) for ecosystems: MA, ME (iv) and for agricultural systems: MA, DGPA, CRDA.
PC. 4.2. Water-related Hazards	<ul style="list-style-type: none"> ▪ <u>Specific actions taken so far for the milestone (water disaster prevention initiatives):</u> There is a national committee to fight against natural disasters and to organize rescue efforts. There is also a regional committee for combating water related hazards in each governorate. These committees have operations manuals and plans for disaster preparedness and disaster management.
<u>Target:</u> Establish at least 1 Early warning System for disaster prevention at national level by 2015.	<ul style="list-style-type: none"> ▪ <u>Existence of Early Warning Disaster prevention System and Year of establishment:</u> <ul style="list-style-type: none"> ○ For the prevention and management of flood risks, the DGRE has put in place in 2008, a system to collect hydrological measurements in real time and announcements of flood in Tunisian wadis (SYCOHTRAC). This system allows the acquisition, collection, processing and dissemination of information in real time, enabling a quick decision during heavy rainfall and floods. It is a network of operational alert for a good understanding of climatic events, providing early warnings for the protection of property and persons against the devastating effects of extreme events. It includes : (i) a network of 130 automatic observation stations for measuring rainfall and water levels in wadis and dams, powered by solar panels. It is equipped with data acquisition system that stores collected information and transmitting the information via (GSM) modules with capture, storage
	<p>and transmission of data through the network mobile (GSM) (ii) eleven call centers and data retrieval based on the DGRE, DGBGTH, and the CRDA (iii) and a computer system (WINMONI) for managing the stations, alarming and gathering and validating the data in the data base SYCOHTRAC. The SYCOHTRAC is also a tool for decision support that allows the consultation and data visualization in real time. A software program (PHy) (rainfall, Hydrometry) allows the access to the database through the WEB technology via the intranet network (AGRINET) of MA allowing operators and decision-maker to: (i) check the database under tabular and / or graphical forms, (ii) editing the rainfall or hydrological sheets, (iii) and take immediate and adequate decisions.</p>
	<ul style="list-style-type: none"> ○ In addition, the AMU countries have established a Maghrebian observatory for the drought, which is a part of the drought early warning system (SMAS) project. The objectives are: the prevention of environmental degradation caused by drought, improving the diagnosis capabilities of the drought crisis and the development of adaptation strategies to reduce the impact of drought using an early warning system (EWS) allowing a regular monitoring of environmental change in the Maghreb countries, and strengthening institutional ability for early warning and drought risk management. The expected results are: (i) the production of indicators of structural and economic vulnerabilities in each country, (ii) the development of structural vulnerability maps, (iii) the integration of EWS products in development plans, (iv) and spreading of EWS products on the Web. The current monitoring tools for measuring the drought impacts, in Tunisia are: (i) meteorological indicators (compared to normal, deciles, or standard precipitation index SPI, reflecting periods of deficit and excess rainfall), agronomic indicators, socio-economic indicators, hydrological, ecological, and socio-economic (ii) remote sensing, (iii) and climate forecasts.

	<p>○ Similarly, the DHMPE of the Ministry of Health is also working very hard at the prevention and management of health risks associated with water and the environment in case of natural disasters. Regarding the monitoring of the state of drought in different meteorological stations in the country, INM develops cards of Standard Precipitation Index (SPI); the mapping of this index shows the areas that are affected by drought.</p>
	<p><i>-Elements of risk knowledge are:</i> Sectoral studies, documents and guides exist as guide of the sustainable management of water resources, drought guide, and management of extreme climate change. They clarify the risks and provide appropriate responses and mitigation strategies to address a specific risk. Observation networks and monitoring of specific indicators and early warning systems help to know the risks.</p>
	<p><i>- Elements of the Monitoring, analysis and prediction of risks:</i> Monitoring, analysis and forecasts of the risks are conducted with a monitoring and information system. <i>-Elements of the Communication or dissemination of alerts and warnings:</i> Alerts and warnings are communicated or distributed according to an agreed communication strategy on risk management. All channels of monitoring and information can be used.</p>
	<p><i>-Elements of local capacity to respond to the warnings received:</i> There are emergency plans and supporting infrastructure at multiple levels. <i>-Sources of verification and specific comments:</i> national committee to fight against natural disasters and rescue organization and the regional committees in each governorate.</p>
<p>PC. 5.1. Institutional arrangements PC. 5.2. Ethics, transparency, empowerment</p>	<p>▪ Specific actions taken so far for the milestone: - Restructuring of BPHE, revision of the Water Code, establishment of the national Water Council ,workshop to launch and implement the development project of SINEAU (26/03/2013) ,national consultation workshop on the review and analysis of the state of implementation of strategies and / or action plans for wastewater in Tunisia (05/03/2013), water table on the water local management (25/12/2013), local governance legal framework of water in Tunisia (27/05/2014),consultation workshop on governance and financing of water sector (18/02/2014) ...</p>
<p>PC. 5.3. Public and private roles PC. 5.4. Right to water PC. 5.5. Regulatory approaches</p>	<p>▪ Existence of policies and reforms of the water, and when the last update: in reference to the following documents: - WATER 21 - Study of the water sector in Tunisia long-term 2030 (MARH 1998) - PISEAU project 1 (2001-2007) followed by PISEAU 2 (2008-2014) - Study of the sustainable management of water resources (2008) - Revision and amendment of the Water Code. Bill revising and implementing decrees (2010-2014) - Water Rights in the new constitution (Article 44) (2014)</p>
<p><u>Target:</u> Institute/update, by 2015, water sector policy reforms that reflect good governance principles of:</p>	<p>-Existence of Water sector policy that reflects good governance principles, and Year of latest update: -The study of the water sector (1998) established the future strategic direction of the sector and laid the basis and the foundations of integrated water resources management (IWRM) The study recommends an integrated approach for the management of water resources and taking into consideration at the same time the management of groundwater and surface water, the management of the quantity and quality of water and the balanced participation between state and users. In addition, it recommends that while pursuing the mobilization of new water resources, a strategy of “demand management” should be conducted in order to reduce losses and protect the quality of water resources, improve the socio-economic effects for the use of water and to minimize environmental damage.</p>
<p>(i) Partnership commitment; (ii) ethics -transparency, equity and fairness; (iii) responsibility and accountability; (iv) inclusiveness, participation, predictability and responsiveness; and (v) coherence.</p>	<p>It seems that we are moving towards a future where allocations between the various water usages are optimized economically and the available water resources are used with an integrated manner. The principles and frameworks of management must ensure a transformation towards a sustainable and equitable solution for everyone.</p> <p>The long-term strategic study of the water sector in Tunisia is based on the prediction of the resources for future mobilization projects and on the evolution of the demand for some socio-economic indicators...</p>

	<p>Given the limited water potential of the country, the increased needs will lead to a rigorous and sustainable integrated management of the resource by:(i) searching for new resources, (ii) the use of non-conventional waters (iii) improving the efficiency of water infrastructure and water conservation (iv) the management of water quality, preservation of the resource and the protection of ecosystems and the environment, (v) mitigation of extreme events (droughts and floods) (vi) the optimization of data collecting systems , accessibility to the information for everyone and the development of a water information system (vi) the development of a public-private-partnership (vii) the implementation of legislation and strengthening the responsibilities of the water management institutions(viii) and the search for tools and appropriate , innovative and diversified funding</p>
	<p>- PISEAU also aims to: (a) promote the integrated management of water resources by (i) the establishment and implementation of an institutional framework and implementation of sectoral reforms to adopt a management demand (changes in tariff policy, new institutional arrangements), (ii) improving the capacity of government, GIC and private sector operators to manage resources in an efficient manner, and (iii) better real-time management of surface and groundwater, and (b) promote the conservation of water resources and environmental protection. PISEAU 1 is based on the following investment components: irrigation management, rural water supply, groundwater management, conservation of water resources and environmental protection, and capacity building. PISEAU 2 continues the investment in the same components. It supports the strengthening of the monitoring networks of water resources, the establishment of the: SINEAU, monitoring system for soil quality and pollution control , groundwater management, the conduct of pilot operations on rural sanitation and improving the quality and value of treated wastewater.</p> <p>- The study of the water sector and PISEAU also recommended that the governance of water and sanitation must be improved.</p>
	<p>Governance is a complex process that involves the participation at several levels beyond the state. The water governance has four main interrelated dimensions: (i) a social dimension that is equitable use of the resource, (ii) an environmental dimension that allows sustainable use of the resource and ecosystem integrity, (iii) an economic dimension: efficient use of the resource, the role of water in economic growth, and (iv) a political dimension to ensure that all stakeholders, users and citizens have equal access to water opportunities.</p>
	<p>The characteristics of good governance are: efficiency, sustainability, participation, accountability, integration, ethics, motivation, transparency, fairness, consistency, openness, and communication. The keys for a good governance are: political will and public-private partnership with respect to the needs and dignity, regulations for the quality of services, service providers efficient and accountable, good policies, effective institutional structures, and public participation.</p> <p>- Revision and amendment of the Water Code. Bill revising and implementing decrees (2010-2014)</p>
	<p>The new Water Code deals with the objectives and general principles, delimitation and preservation of public water domain, governance in the water sector, regimes to use the water, uses and water utilities, prevention and risks related to water, regime control and monitoring, and transitional and final provisions.</p> <p>- Water Rights in the new constitution (Article 44) (2014)</p> <p>Article 44: "The right to water is guaranteed. The water preservation and the rationalization of its operating is the responsibility of the State and the society. "</p>
	<p>Elements on Partnership and commitment: ONAS has already initiated activities in partnership with the private sector for the operation of sanitation facilities (network, pumping stations and treatment plants). The rate of private sector involvement in the operation of the infrastructure was 12% in 2005, rose to 16% in 2011 and fell to 13% in 2012 and 2013. Similarly SONEDE intends financing, building and operating sea water desalination plant of Djerba by BOT concession contract.</p> <p>Elements on Ethics - transparency, equity and fairness: existence of legislative and regulatory frameworks</p>

	<p>Elements on responsibility and accountability: each institution knows and accepts responsibility for his actions, existence of legislative and regulatory frameworks</p> <p>Elements on inclusiveness, participation, predictability and responsiveness: Duty to respond to the need of the demand, clear objectives and impact assessment existence of manuals of procedures.</p> <p>Elements on Coherence: coherent frameworks</p> <p>Sources of verification: The documents mentioned above. However, it is necessary to update and consolidate the 2015 political reforms in the area of water and sanitation, which reflect the principles of good governance.</p>																				
<p>PC. 6.1. Financing Local Authorities</p> <p><u>Targets:</u></p> <p>-Allocate immediately at least 0.5 % of GDP to sanitation & hygiene.</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: Water, sanitation and hygiene budget in recent years is still insufficient to achieve the targets. ▪ Achievement for GDP allocation: (MTDN) 1 TDN=0.627 \$ on 27/03/2013 <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- GDP (A₁)</td> <td>55 267.8 (34.652911 10⁹\$)</td> <td>64 730.6 (40.586086 10⁹\$)</td> <td>70 584.6* (44.256544 10⁹\$)</td> <td>75 646.4* (47.430293 10⁹\$)</td> </tr> <tr> <td>- Sanitation and Hygiene Budget (B₁)</td> <td>93.0 (58.311 10⁶\$)</td> <td>109.1 (68.4057 10⁶\$)</td> <td>91.5 (57.3705 10⁶\$)</td> <td>96.9 (60.7563 10⁶\$)</td> </tr> <tr> <td>Percentage of GDP for Sanitation and Hygiene gdpSH (%) = B₁/A₁</td> <td>0.17</td> <td>0.17</td> <td>0.13</td> <td>0.13</td> </tr> </tbody> </table>	Years (i)	2008	2011	2012	2013	- GDP (A ₁)	55 267.8 (34.652911 10 ⁹ \$)	64 730.6 (40.586086 10 ⁹ \$)	70 584.6* (44.256544 10 ⁹ \$)	75 646.4* (47.430293 10 ⁹ \$)	- Sanitation and Hygiene Budget (B ₁)	93.0 (58.311 10 ⁶ \$)	109.1 (68.4057 10 ⁶ \$)	91.5 (57.3705 10 ⁶ \$)	96.9 (60.7563 10 ⁶ \$)	Percentage of GDP for Sanitation and Hygiene gdpSH (%) = B₁/A₁	0.17	0.17	0.13	0.13
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<p><u>and</u></p> <p>-Allocate immediately 5% of national budget for water & sanitation.</p>	<p>*2012 semi-final; 2013 provisional (Source INS) Sanitation data: Source ONAS 06/2014 Hygiene data: Source DHMPE 30/06/2014</p> <ul style="list-style-type: none"> ▪ Achievement for national budget allocation: (MTDN) 1 TDN=0.627 \$ on 27/03/2013 <table border="1"> <thead> <tr> <th>Years (i)</th> <th>2008</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>- Total National Budget (A₂)</td> <td>16 068.3 (10 074.824 10⁶\$)</td> <td>20 350.0 (12 759.45 10⁶\$)</td> <td>25 551.0 (16 020.477 10⁶\$)</td> <td>26 792.0 (16 798.584 10⁶\$)</td> </tr> <tr> <td>- Water and Sanitation Budget (B₂)</td> <td>396.6 (248.6682 10⁶\$)</td> <td>424.3 (266.0361 10⁶\$)</td> <td>492.8 (308.9856 10⁶\$)</td> <td>480.2 (301.0854 10⁶\$)</td> </tr> <tr> <td>Percentage of national Budget to Water and Sanitation BdgWS (%) = B₂/A₂</td> <td>2.5</td> <td>2.1</td> <td>1.9</td> <td>1.8</td> </tr> </tbody> </table>	Years (i)	2008	2011	2012	2013	- Total National Budget (A ₂)	16 068.3 (10 074.824 10 ⁶ \$)	20 350.0 (12 759.45 10 ⁶ \$)	25 551.0 (16 020.477 10 ⁶ \$)	26 792.0 (16 798.584 10 ⁶ \$)	- Water and Sanitation Budget (B ₂)	396.6 (248.6682 10 ⁶ \$)	424.3 (266.0361 10 ⁶ \$)	492.8 (308.9856 10 ⁶ \$)	480.2 (301.0854 10 ⁶ \$)	Percentage of national Budget to Water and Sanitation BdgWS (%) = B₂/A₂	2.5	2.1	1.9	1.8
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	<ul style="list-style-type: none"> ▪ Sources of verification (i) For GDP and total national budget of the country, the source is INS (ii) Water, sanitation and hygiene budget, the data source is the Ministry of Finance, Ministry of Agriculture (GBO program), ONAS and DHMPE. Need to bring the percentage to 0.5% of GDP on hygiene and sanitation and to 5% the percentage of GDP national budget for water and sanitation. 																				
<p>PC. 6.2. Pricing Strategies</p> <p>PC. 6.3. Pro-poor financing Strategies</p>	<ul style="list-style-type: none"> ▪ Specific actions taken so far for the milestone: ▪ Describe the Water Tariff Structure: ✓ Minimum life line demand (l / person / day): 20 m³/ connection / quarter or 45 l / person / day. ✓ Minimum salary of the population SMIG (48 hours per week): TDN 319,904 or \$ 189.38. ✓ Rate (USD or EURO / local currency): 1 Tunisian dinar for \$ 0.592 (24/06/14). 																				

<p>Target: Set by 2015, water tariff system that addresses cross-subsidy and the need of poor.</p>	<p>Example for Indicator:</p> <ul style="list-style-type: none"> ✓ Lifeline Water (l/ca/day): 100 ✓ Minimum salary of the population (TD/month): 319.9 ✓ For a hypothetical 5 persons family: ✓ $\text{water used} = 100 \text{ l/c/d} * 5 * 30 / 1000 = 15 \text{ m}^3$ ✓ (minimum billed = 20 m³) ✓ cost at 0.155 TD /m³ = 3.1 TD ✓ % of minimum monthly income = $3.1/319.9 = 1\% < 3\%$ 																
	<p>Target is met. Tariff Structure: The water tariff was adjusted 2 times in 2013. The first adjustment by decree of 13.06.2013 and the second by decree of 26.12.2013 (in force).</p> <table border="1"> <thead> <tr> <th>Consumption categories (m³/ quarter)</th> <th>Rate (local currency mls/m³ and USD/m³)</th> </tr> </thead> <tbody> <tr> <td>0-20</td> <td>155 mls/m³ which is 0,09 USD/m³</td> </tr> <tr> <td>21-40</td> <td>270 which is 0,159</td> </tr> <tr> <td>41-70</td> <td>365 which is 0,216</td> </tr> <tr> <td>71-100</td> <td>665 which is 0,393</td> </tr> <tr> <td>101-150</td> <td>815 which is 0,482</td> </tr> <tr> <td>151-500</td> <td>1135 which is 0,672</td> </tr> <tr> <td>≥ 501</td> <td>1190 which is 0,704</td> </tr> </tbody> </table>	Consumption categories (m ³ / quarter)	Rate (local currency mls/m ³ and USD/m ³)	0-20	155 mls/m ³ which is 0,09 USD/m ³	21-40	270 which is 0,159	41-70	365 which is 0,216	71-100	665 which is 0,393	101-150	815 which is 0,482	151-500	1135 which is 0,672	≥ 501	1190 which is 0,704
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	<p>Adjustments for cross-subsidy:</p> <table border="1"> <thead> <tr> <th>Adjustments</th> <th>Rate</th> </tr> </thead> <tbody> <tr> <td>Rural hydrants (Standpipes)</td> <td>155 mls/m³ = 0,09 USD/m³</td> </tr> <tr> <td>Tourism</td> <td>1190 mls/m³ = 0,704 USD/m³</td> </tr> </tbody> </table> <p>Fixed charges are in addition to this fee, the value is determined by the diameter of the counters: D15 (DT 4.400 / quarter), D20 (8.160), D30 (15.080), D40 (27.700), D60 and D80 (70.400), D100 (113.250) and D150 (295.000). This tariff reflects the equalization and access for the poor (social group) and encourages saving water.</p>	Adjustments	Rate	Rural hydrants (Standpipes)	155 mls/m ³ = 0,09 USD/m ³	Tourism	1190 mls/m ³ = 0,704 USD/m ³										
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<p>PC. 7.1. Education and capacity development</p> <p><i>Target:</i> <i>To be identified.</i></p>	<p>▪ Not to be reported.</p>																													
<p>PC. 7.2. Information</p> <p><i>Target:</i> Enhance by 2016, the national water and sanitation Monitoring, Evaluation and Reporting (M&E, &R) Systems in a way to be in line with the pan African M&E.</p>	<p>▪ Specific actions taken so far for the milestone: - <i>launching of the development project and establishment of SINEAU 26/03/2013 in Tunis.</i> - <i>Strengthening of the existing monitoring and evaluation and reporting systems to be in line with the Pan African SE.</i></p> <p>▪ Existence of national Water & Sanitation M&E, & R System, and Year of Establishment: - <i>There is no "declared" M&E&R water and sanitation national system, on the other hand some institutions have management sub-systems for the data from the water sector such as the SYGREAU for the DGRE, the COPEAU for the ANPE, the SISOLS for the DGACTA and the aggregate monitoring system of the water sector under implementation at the BPEH, while other institutions have simple databases.</i></p> <p>- <i>The SINEAU: the national information system on water, which presents a dynamic portal, must bring together all the existing and the future sub systems. A workshop on the development project and the establishment of SINEAU just took place on 26/3/2013 in Tunis.</i></p>																													
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	<p>Elements of the pan African M&E incorporated:</p> <ul style="list-style-type: none"> -Improvement, harmonization and strengthening of the existing sub management information systems (SMIS). - Establishment of a data management system in line with the Pan African system of monitoring and evaluation (AMCOW) <p>▪ Sources of verification: DGRE/MA</p>
PC. 7.3. Water and Technologies <i>Target:</i> <i>To be identified.</i>	▪ Not to be reported.
PC. 7.4. Professional Networks/ Associations <i>Target:</i> <i>To be identified.</i>	▪ Not to be reported.

Observations and General Comments on the Evaluation

Tunisia has undertaken a number of specific actions to be consistent with the monitoring and evaluation Pan African system and progresses have been made to achieve the targets of 2015 and 2025. However some problems still exist and have to be eliminated, important elements are missing in the development and the implementation and have to be promoted and options on water and sanitation policies are needed to meet present and future needs.

- Hydroelectric power is nearly 1% of the total energy produced by the country, and the current increase rate index of the use of hydro-energy does not achieve the target that aims to increase its use of 10% between 2000 and 2015.
- The target to increase the satisfaction level index of water needs (WDSI) of 10% between 2000 and 2015 is met except for 2012, relatively dry year. It seems that WDSI is highly controlled by the fluctuation in green water.
- The percentage of rainwater utilization is still very low $\leq 2\%$ and does not tend toward growth. Thus the objective to increase the proportion of rainwater use in municipal water consumption to 10% remains elusive. A proper study is to be conducted: diagnosis, inventory, characterization, strategy, action plans.
- Rural sanitation remains the weakest point of the chain and institutional deficiency is to be raised as soon as possible.
- An early warning system for the prevention of natural disasters is to be implemented at national level by 2015 like the Maghrebian early warning drought system (SMAS).
- Continued development and implementation of IWRM in all its components, and improving water governance, with establishment and updating political reforms in the water sector (expected to be completed by 2015), which reflect the principles of good governance (to be included in the new water Code).
- The immediate allowance at least 0.5% of GDP on hygiene and sanitation and at least 5% of the national budget to water and sanitation.

Strengthening 2015 monitoring, evaluation and reporting systems of the water sector to be in line with the Pan-African monitoring and evaluation system.

MEWINA

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Monitoring and Evaluation for Water In North Africa

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