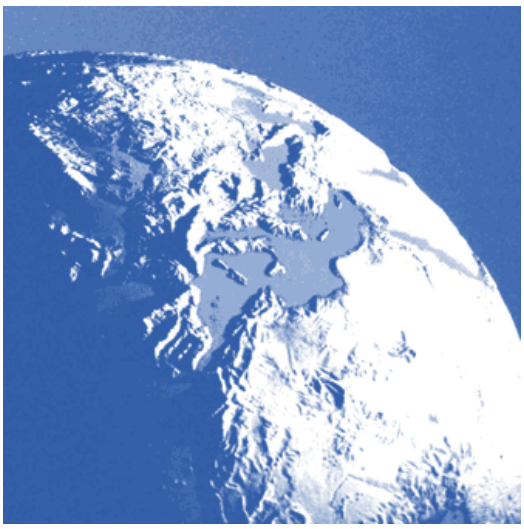
Méditerranean Commission of Sustainable Development

Mediterranean Strategy for Sustainable Development

Monitoring progress and promotion of water demand management policies

indicators methodological Files



Plan Bleu
Regional Activity Centre
Sophia Antipolis
April 2006

Definitions of some source data

1. Renewable natural fresh water average resources

Renewable natural fresh water average resources (of surface and underground), expressed in km3/year, represent the maximum potential of water resources "offered by nature" on average (sum of the product from surface and underground flows forming the " interior contribution " generated by precipitations, and of external contributions from outside the basin (surface or underground flows coming from other countries) which can be exploited more or less intensely without affecting the rights of the future generations, since it is renewed each year thanks to rainfall, as long as it is not deteriorated by the climate change.

The renewable water resources consist of flows and not of stocks, like other raw materials, and these fresh water flows are naturally maintained by the water cycle with its continental influences.

The average values of renewable natural fresh water resources, calculated over a long period, characterize the hydrology of the basin.

A part only of these natural resources is exploitable because of various technical-economic and environmental constraints.

2. Renewable natural fresh water average resources per capita

The renewable natural fresh water average resources per capita, expressed in km3/inhab/year, are calculated by the ratio of the renewable natural fresh water average resources to the population of the territory on a specified date.

3. Total withdrawals from the renewable natural fresh water resources

The withdrawals are defined by the sum of the volumes of the annual withdrawals of conventional renewable natural water for all uses, including the losses during transport, in reference to one specified year. (They exclude the extractions from non-renewable water, to be counted separately).

4. Overexploitation of the renewable natural fresh water resources

The overexploitation of the renewable natural fresh water resources is strictly defined when withdrawal exceeds the average annual renewal or, more largely, when exploitation causes undesirable impact.

5. Irrigated surfaces

The irrigated surfaces are surfaces equipped to provide water for crops. These include the areas equipped for complete or partial control of the irrigation, the areas irrigated by rises in water level and by the equipped wetlands (FAO).

List of "Water" indicators

	code	Indicators
1	WAT_P01	Index of water efficiency (total and by sector)
2	WAT_P02	Water demand (total and by sector), and compared to the GDP (total and by sector)
3	WAT_P03	Exploitation index of renewable natural resources
4	WAT_P04	Share of the population with access to an improved water source (total, urban, rural)
5	WAT_P05	Share of the population with access to an improved sanitation system (total, urban, rural)
6	WAT_C01	Regulation index of water resources
7	WAT_C02	Silting up rate of dam reserves
8	WAT_C03	Non-sustainable water production index
9	WAT_C04	Surface equipped with modern irrigation systems
10	WAT_C05	Human and economic impact of floods
11	WAT_C06	Wetland area
12	WAT_C07	Water requirements for the ecosystems
13	WAT_C08	General water quality index
14	WAT_C09	Emissions of organic water pollutants
15	WAT_C10	Share of collected and treated wastewater by the public sewerage system
16	WAT_C11	Share of industrial wastewater treated on site
17	WAT_C12	Water cost recovery rate (total and by sector)
18	WAT_C13	Rate of public investments and expenditure allocated to water and Water Demand Management (WDM)
19	WAT_C14	Public development assistance devoted to water and proportion of this aid dedicated to programs of WDM

WAT_Pxx : priority « water » indicators

WAT_Cxx : complementary « water » indicators

Priority indicators

STRATEGY **INPROVING INTEGRATED RESOURCES AND WATER DEMAND MANAGEMENT**	**PRIORITY INDICATORS**	**MCSD** **ENVIRONMENT** **Freshwater and waste water**
Water Efficiency Index (total and by sector)	**MSSD 1** **WAT_P01**	

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Strategic Objective:

To stabilize water demand: reduction in the North and controlled increase in the South and East. To reduce losses and misuse by defining efficiency targets in all sectors. To create more added value through more efficient use of water for irrigation, cities and industry, and to satisfy economic and social requirements at lower costs.

Rationale:

Water volumes lost and "misused" in all sectors are such that they artificially increase water demand in Mediterranean countries. Thus, at the scale of Mediterranean catchment's areas, the "feasible savings potential" has been appraised to be at 24% of current demand.

Definition:

This indicator measures progress in water savings through demand management, by reducing losses and waste during transport. It covers total and sectoral Efficiency (drinking water, agriculture and industry):

1) Sectoral Efficiencies

    a) Drinking Water Efficiency

This is the share of drinking water produced, distributed1, and paid by consumers.

$$\mathbf{E_{pot} = V1 / V2} \text{ where}$$

- V1 = drinking water volume invoiced and paid by consumer
- V2 = total drinking water volume produced and distributed

The indicator measures both the physical efficiency of drinking water distribution networks (loss rates or yield) and economic efficiency, e.g., the capacity of network managers to cover costs through consumer payments.

    b) Irrigation Water Efficiency

The physical efficiency of irrigation water is the product of "network for irrigation water transport and distribution" efficiency by plot efficiency:

$$\mathbf{E_{irr} = E1xE2}$$

- E1: efficiency of irrigation water transport and distribution networks, upstream from agricultural plots, measured as the ratio between water volumes actually distributed to plots and the total volume of water for irrigation, upstream of networks, including losses in networks ;

- E2: plot irrigation efficiency is defined as the sum of efficiencies (per plot) of all irrigation methods (surface irrigation, sprinkler irrigation, micro-irrigation, others), weighted by the respective proportions of all local methods and estimated as the ratio between water volumes actually consumed by plants and volumes delivered to plots.

[1] In the sense of networks upstream from losses.

$$E2 = \sum_{1}^{n} \frac{Sm \times Em}{S}$$

- n : number of irrigation methods used:
- Sm: surfaces irrigated using method : m
- Em: method efficiency: m
- S : total local irrigated surface according different methods

c) Industrial Water Efficiency

The volume of recycled industrial water (recycling index)

$$\mathbf{E_{ind} = V1 / V2}$$

- V1 = Recycled water volumes
- V2 = Gross volume consumed for industrial processes which is equal to the volume incoming for the first-time to the industrial plant + recycled volume.

2) Total Efficiency

Total physical efficiency of water consumption is defined as the sum of used water quantity ratios per sector (demand-losses) over sector demand, weighted by the share of sectoral requirements (drinking water, irrigation and industry)

$$E = \frac{(Epot \times Dpot + Eirr \times Dirr + Eind \times Dind)}{D}$$

Water demand is defined as the sum of water volumes dedicated to satisfying needs (excluding « green » water and « virtual » water), including volumes lost in production, transport and consumption. This corresponds to the sum of water volumes abstracted, non-traditional water production (desalination and imports), and water reuse, minus export volumes.

Unit

Percentage

Objective and/or targeted values:

To achieve the 2025 physical efficiency levels recommended by the alternative scenario of the Plan Bleu:

- Drinking water in communities : restore levels of distribution losses to 15%;
- Industry recycling generalized at 50%;
- Irrigation: restore levels of transport losses to 10% and maintain high physical efficiency at 80%.

Or to achieve national total physical efficiency objectives.

Methodological Indications:

When network measurement tools are available (meters, satellite imaging), the efficiency of the irrigation network (E1) can be estimated by management structures. Efficiency is network-specific. However, national average efficiency could be assessed by computing individual network averages, weighted by volumes distributed yearly.
In situ measurements of actual average plot irrigation efficiency (E2) are more complex, in view of the difficulty in precisely assessing volumes consumed by plants, and in view of the high number of plots. The value of E2 will be estimated. Each country has national estimates of the average efficiency of all systems, based on pilot experiments. The value of E2 in fact highlights the distribution of irrigation per major modes of irrigation at national level.
As an initial approximation, and in the absence of precise data on the actual efficiency of the modes of irrigation, the indicator may be computed on the basis of theoretical average efficiency estimated at 40% for surface irrigation, 70% for sprinkler irrigation and 90% for localised irrigation.

E2 = (S1x0,40+S2x0,70+S3x0,90)/S

- S1 : surface irrigation and similar;
- S2 : land irrigated by sprinkler
- S3 : land irrigated with the localised irrigation method
- S : total country surface irrigated for all modes of irrigation

Geographical scope:

NATIONAL LEVEL	CATCHMENT AREAS	MEDITERRANEAN COASTAL ZONES (NUTS 3)	COASTAL ZONES	MEDITERRANEAN SITES	MARINE ZONES
YES	YES	-	-	-	-

References:

- L'eau des méditerranéens : situation et perspectives, Jean Margat, PNUE, PAM, Plan Bleu, 2004
- « A Sustainable Future for the MEDITERRANEAN : The Blue Plan's Environment & Development Outlook», Plan Bleu, 2005
- http://www.veoliawater.com/services/industrial-customers/applications/re-use/

International Data Sources:

FAO-Aquastat http://www.fao.org/ag/agl/aglw/aquastat/dbase/index.stm

Precaution for use:

In some cases, and due to the diversity in data sources for one country, or due to heterogeneous definitions, total water demand can be different from the sum of demand in various sectors.
The economic efficiency of drinking water is dependent on invoicing modes (subscription, meters) and meter malfunction can yield biased results.

STRATEGY **INPROVING INTEGRATED RESOURCES AND WATER DEMAND MANAGEMENT**	**PRIORITY INDICATORS**	**MCSD** **ENVIRONMENT** **Freshwater and waste water**
Water demand (total and by sector), and compared to the GDP (total and by sector)	**MSSD 2** **WAT_P02**	

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Strategic Objective:

To stabilize water demand: reduction in the North and controlled increase in the South and East. To reduce losses and misuse by setting consumption efficiency objectives for all sectors. To create additional added value through more efficient use of water for irrigation and industrial and urban needs. To decouple water demand and gross domestic product (GDP) growth and significantly increase added value from agriculture per cubic meter consumed.

Rationale:

The evolution of water demand is a major concern in the Mediterranean, in view of the scarcity of the resource.
Demographic growth and the associated drinking water demand are naturally the main factors responsible for the changes in water consumption, particularly in high-growth urban areas, and as regards the higher irrigation requirements to cover food production. Industrial development is also a major factor.

Definition:

This indicator is defined by:

- Total water demand defined as the sum of consumed water volumes (excluding « green [1] » water and « virtual [2]» water) to satisfy different uses, including volumes lost during production, transport and consumption. It corresponds to the sum of water samples, unconventional water production, reuse and imports, minus exports. Total (km^3) and relative share (%) per sector will be specified – agriculture, industry, household water consumption (including tourism) ;

- Water demand and demand compared to GDP, total and for agriculture and industry, by computing the ratio of agricultural and industrial water respectively over agricultural and industrial GDP. As regards agriculture, the ratio of irrigation water demand can be computed over the added value from irrigated production.

Unit:

- km3/year for total demand and % per sector

- km3 / US$ for demands compared to GDP

Objective and/or targeted values:

For agriculture: reduce demand forecasts by 10% in 2015 and increase added value from production.

Methodological Indications:

GDP figures are aggregates of National Accounting, corresponding to the sum of added value created by resident producers (plus taxes minus subsidies). For this indicator, GDP is expressed at constant prices. Data in national currency can be converted in US$ at constant PPP.
Purchasing Power Parity (PPP) are rates which allow conversion to a common currency while eliminating purchasing power differences between currencies. In other words, their application for conversion purposes eliminates inter-country disparities.

[1] rainwater, returning to the atmosphere, through evaporation or consumption by useful vegetation (crops, grazing lands, forests)
[2] corresponds to water quantities consumed by exporting countries for food production

This indicator can also be used to compute water demand per capita, as it measures different demands within one regional group or worldwide.

Geographical scope:

NATIONAL LEVEL	CATCHMENT AREAS	MEDITERRANEAN COASTAL ZONES (NUTS 3)	COASTAL ZONES	MEDITERRANEAN SITES	MARINE ZONES
YES		-	-	-	-

References:

- L'eau des méditerranéens : situation et perspectives, Jean Margat, PNUE, PAM, Plan Bleu, 2004
- « A Sustainable Future for the MEDITERRANEAN: The Blue Plan's Environment and Development Outlook », Plan Bleu, 2005

International Data Sources:

FAO-Aquastat http://www.fao.org/ag/agl/aglw/aquastat/dbase/index.stm

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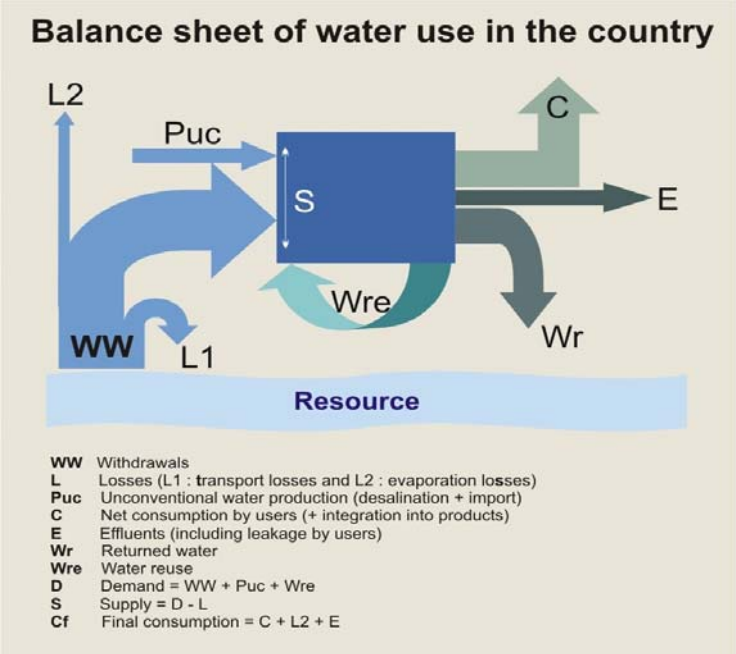
Precautions for use:

Methodological Annex:



Source : Plan Bleu, J. Margat

STRATEGY **INPROVING INTEGRATED RESOURCES AND WATER DEMAND MANAGEMENT**	**PRIORITY INDICATORS**	**MCSD** **ENVIRONMENT** **Freshwater and waste water**
Exploitation Index of Renewable Resources	**MSSD 3** **WAT_P03**	

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Strategic Objective:

To promote integrated catchment area management, including surface water and groundwater, as well as ecosystems and to foster depollution objectives (to preserve water resources).

Rationale:

The pressure on renewable water resources is increasing in most countries of the South and East Mediterranean. The renewable resources consumption index can sometimes exceed 100%.

Definition:

This indicator measures the relative pressure of annual abstraction (A) over traditional renewable natural drinking water resources (R).

(A / R) x 100

A: Amount of annual traditional renewable natural water volumes consumed for all other purposes, including volume losses during transport ;

R: Annual traditional renewable natural water flow volume. Country resources are individually defined by surface run-off and underground flows, either formed or entering the territory. Volumes are measured on the basis of hydrological data, in reference to average values over sufficiently long periods to ensure stability, and to avoid double accounting of surface and underground water.

Unit:

Percentage

Objective and/or targeted values:

Countries are said to be facing water shortage when the volumes consumed represent over 50% of available water resources. When figures exceed 70%, the situation is qualified as « critical ».

Methodological Indications:

The «renewable natural freshwater resources» indicator is the sum of surface run-off or underground flows which form the «internal contribution » in rainfall and external resources. Underground water tables produce renewable underground freshwater resources.
The significance of this indicator applies to basins and regions as well as countries, and assesses risks of over-abstraction of underground water resources.

Geographical scope:

NATIONAL LEVEL	CATCHMENT AREAS	MEDITERRANEAN COASTAL ZONES (NUTS 3)	COASTAL ZONES	MÉDITERRANÉAN SITES	MARINE ZONES
YES	YES	-	-	-	-

References:

- Water resources and uses in the Mediterranean Countries : Figures and facts, Plan Bleu : MARGAT J. & VALLEE D., 1999.
- « L'eau des méditerranéens : situation et perspectives », Jean Margat, PNUE, PAM, Plan Bleu, 2004

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- « A Sustainable Future for the MEDITERRANEAN: The Blue Plan's Environment and Development Outlook», Plan Bleu, 2005

International Data Sources:

WRI (http://earthtrends.wri.org/)

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Precautions for use:

Estimates of available water resources are yearly rather than pluriannual averages. Long-term averages (20 years) are to be applied. Calculations must take into account both the zones of consumption and the zones where resources are assessed, which are most often catchment areas.
Variations in gross consumption may stem from fluctuations in demand, in non-traditional production, as well as from losses.
Above 50%, the consumption index is an indicator which applies to more collective and deterministic water management, particularly as regards more efficient management of water consumption and demand.
An exploitation index exceeding 100% is not necessarily an indicator of shortage or global «overuse» of resources. In large countries, where catchment areas are extensive and where hydrographical networks are active, water consuming activities may be spread sequentially in space and can involve reuse of used water volumes (reuse, recycling).
Adversely, consumption indices under 100% do not exclude potential local over-consumption, particularly as regards depletion of groundwater reserves.

STRATEGY **INPROVING INTEGRATED RESOURCES AND WATER DEMAND MANAGEMENT**	PRIORITY INDICATORS	MCSD ENVIRONMENT Freshwater and waste water
Share of population with access to an improved water sources (total, urban, rural)	**MSSD 4** **WAT_P04**	

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Strategic Objective:

To achieve Millennium Goals for development regarding access to drinking water.

Rationale:

According to currently available UN estimates, rates of water supply to rural populations in Mediterranean countries remain low. Approximately 30 million inhabitants of the region do not have access to an improved water sources.

Definition:

This indicator covers the share of populations supplied with or having reasonable access to sufficient volumes of drinking water. The volume required to satisfy metabolic, hygienic and domestic requirements is estimated at a minimum of 20 litres per day and per capita.

(E / P) x 100

E: Population supplied with or having reasonable access to sufficient water volumes within reasonable distance.
P: Total Population.
This indicator may be calculated for urban and rural populations on specific dates.

Unit:

Percentage

Objectif and/or targeted values:

To reduce by half the proportion of populations deprived of regular access to drinking water by 2015.

Methodological Indications:

Drinking water is water free of pathogens or chemical agents at levels detrimental to health; this includes drilling water, wells and treated and non-treated surface waters which are not contaminated. Waterways and lakes must be considered as drinking water if water quality is regularly monitored and acceptable to Public Health authorities.
Reasonable access signifies the existence of household water supply, or that of a source within less than 1,000 meters in distance.

Geographical scope:

NATIONAL LEVEL	CATCHMENT AREAS	MEDITERRANEAN COASTAL ZONES (NUTS 3)	COASTAL ZONES	MÉDITERRANÉAN SITES	MARINE ZONES
YES		-	-	-	-

References:

Millennium indicators:

- http://millenniumindicators.un.org; http://www.childinfo.org

International Data Sources:

Millennium indicators:

- http://millenniumindicators.un.org; http://www.childinfo.org
- http://www.un.org/esa/sustdev/natlinfo/indicators

Precautions for use:

The distinction between « urban » and « rural » populations can not be satisfied with a single global definition, due to the differences between urban and rural area characteristics in the different countries. National definitions usually refer to the size of the locality. Rural populations represent the rest of the population not considered as urban.
This indicator does not take into consideration the issues facing populations in many Mediterranean cities, submitted to frequent interruptions in water supply.
National definitions of urban populations are not similar, and may lead to biased international comparisons.

Methodological Annex:

According to the World Health Organization, “improved” water sources involve public water conveyance networks, public drilling operations, and collected rainwater.
«Non-improved» sources are: unprotected wells and sources, purchase from water distributors, bottled water (issue of water supply quantity rather than quality), water delivered in tankers. «Access » refers to a source producing at least 20 litres per capita and per day, and located at less than 1,000 meters in distance. This assumption has been tested by WHO, in its National Health Study, conducted in 70 countries. (March 25,2003 Communication, Health and Sanitary Program).

STRATEGY **INPROVING INTEGRATED RESOURCES AND WATER DEMAND MANAGEMENT**	PRIORITY INDICATORS	MCSD ENVIRONMENT Freshwater and waste water
Share of population with access to an improved sanitation system (total, urban, rural)	**MSSD 5** **WAT_P05**	

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Strategic Objective:

To achieve Millennium Goals for development regarding access to sanitation.

Rationale:

While at global level, over half the population is still deprived of access to basic sanitation systems; nearly 27 million people in the Mediterranean have no access to adequate sanitation systems.

Definition:

This indicator represents the share of population having access to basic sanitation systems, installed in homes or in the immediate vicinity, for the evacuation of human faeces (public sanitation network, septic tank…)

(A / P) x 100

A: Population having access to adequate sanitation installations
P: Total Population.

This indicator is also calculated for urban and rural populations.

Unit:

Percentage

Objectif and/or targeted values:

To reduce by half the proportion of populations deprived of regular access to basic sanitation systems by 2015.

Methodological Indications:

WHO definitions for « sanitation systems » apply to: Connections to public sewage systems, septic tanks, pour-flush latrines, simple pit latrines, ventilated improved pit latrines.
Faeces treatment systems are considered to be adequate when they are private (or shared, but not public) and if they prevent all contact between man and faeces.
« Non-improved » technologies apply to: latrines where faeces are removed manually, public latrines, open pit latrines, bucket latrines.
The characteristics of Mediterranean urban and rural areas are different. Therefore, no single definition can be applied regionally as regards the distinction between “urban” and “rural” populations. National definitions most often refer to the size of locations. Rural populations represent the rest of the population considered as non-urban.

Geographical scope:

NATIONAL LEVEL	CATCHMENT AREAS	MEDITERRANEAN COASTAL ZONES (NUTS 3)	COASTAL ZONES	MEDITERRANEAN SITES	MARINE ZONES
YES		YES	YES	-	-

References:

Millennium indicators:
http://millenniumindicators.un.org; http://www.childinfo.org

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International Data Sources:

Millennium indicators:

- http://millenniumindicators.un.org; http://www.childinfo.org
- http://www.un.org/esa/sustdev/natlinfo/indicators

Precautions for use:

The simple fact that installations exist does not signify that they are actually used. Sanitation systems in urban areas must allow the collection and evacuation of used waters of all types (Toilet (WC) water, domestic waste water except toilet (WC) water, industrial waste water) and ensure transport to the treatment site (water treatment plant) as quickly as possible.
National definitions of urban populations are not similar, and may lead to biased international comparisons.

Complementary indicators

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater and waste water
REGULATION INDEX (AVERAGE FLOW OF WATER RESOURCES CONTROLLED COMPARED TO NATURAL IRREGULAR FLOW)	WAT_C01	

Strategic objective:

To decrease the vulnerability to the risks of floods and drought.

Rationale:

The principal constraint of the regulation of the surface water resources is related to the condition of regulating installations, which the regulation index represents.

Definition:

This indicator measures the efforts made for the control of the irregular water resources, by the construction of dams, i.e. the annual security of supply. It is calculated as the proportion of the irregular natural theoretical flow actually and regularly available for annual use:

100 x Qr / Qt

Qr : sum of the irregular flows regularized by reserves (annual average)
Qt : annual average irregular flow (intern and external).

Unit:

Percentage.

Objective and/or targeted values:

National objective

Methodological indications:

A conventional definition of the irregular flows is necessary; the simplest one consists in deducing these irregular flows by withdrawing the natural regular flows from the total flow. The natural regular flows are defined as the minimal monthly flow in an average year.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
YES	YES	-	-	-	-

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater et waste water
RATE OF SILTING UP OF DAM RESERVES	WAT_ C02	

Strategic objective:

To decrease the vulnerability to the risks of floods and drought.

Rationale:

Each year, the silting of dams decreases the total storage capacity of the national hydraulic facilities. These losses of capacity are estimated at several Mm3/year. In Morocco, for example, because of silting, loss of water is equivalent to the volume necessary for the irrigation of 6000 ha/year.

Definition:

This indicator informs us about the problems of the silting up of dams, the degradation of the catchment area and the mobilization rate of the water resources, problems which compromise the mobilization and the stock management of water resources. This indicator is calculated as the volume of the mud (solid contributions)"M" compared to the initial total reserve capacity of dams "C":

Unit:

Percentage

Objective and/or targeted values:

Methodological indications:

The capacities of the silting dams and the rate of silting of the dams reserves are evaluated after each year on the basis of bathymetric or different campaigns.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
YES	YES	-	-	-	-

References:

SEE (Maroc) Test marocain pour les indicateurs de développement, Janvier 2003

International data sources:

World Commission for dams : www.dams.org

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater et waste water 85
NON-SUSTAINABLE WATER PRODUCTION INDEX	WAT_C03	

Strategic objective:

To preserve water resources

Rationale:

Some Mediterranean countries that are low in water exploit non renewable water stocks, thus irreversibly depriving the future generations of this possibility, as in any groundwater mining. Moreover, overexploitation of renewable water adds to the fossil groundwater withdrawals, bringing the indexes for non sustainable production to a high level.

Definition:

This indicator illustrates the importance of non renewable groundwater de-stocking (fossil water) to come up to water demand.

It corresponds to the proportion of the total annual water withdrawals (including losses during transport) deriving from fossil aquifer reserves and from the overexploitation of water tables, expressed as a percentage.

Formula: **100x (Pf + Ps)/P**

Pf: annual volumes withdrawn from aquifers with non-renewable resources (fossil water), in hm3/year on a specified date;
Ps: annual volumes coming from the overexploitation of water tables with renewable water resources in hm3/year (There is overexploitation when withdrawals exceed the average annual renewal or involve undesirable impact);
P: total annual volume of water withdrawals in hm3/year, at the same date.

Unit:

Percentage.

Objective and/or targeted values:

As the use of such non-sustainable reserves (non renewable resources and overexploitation) is not desirable, the objective to be reached is 0%.

Methodological indications:

This indicator can apply either to the only groundwater withdrawals, or to the whole water withdrawals .

geographical scope:

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	-	-	-	-

References:

Plan Bleu: MARGAT (J.), VALLEE (D.) – Water Resources and uses in the Mediterranean countries: figures and facts, 1999;

L'eau des méditerranéens : situation et perspectives, Jean Margat, PNUE, PAM, Plan Bleu, 2004;

A Sustainable Future for the MEDITERRANEAN: The Blue Plan's Environment and Development Outlook, 2005;

Les indicateurs de l'économies de l'eau : Ressources et utilisations, PAM/Plan Bleu, mai 1996.

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ECONOMIC ACTIVITIES AND SUSTAINABILITY agriculture
SURFACE EQUIPPED WITH IRRIGATION MODERN SYSTEMS	WAT_C04	

Strategic objective:

To stabilize water demand through the reduction of water losses and wasteful use of water (reduction in demand in the north and controlled increases in the south and the east) and to increase the added value per cubic metre of water used.

Rationale:

In agriculture, the irrigation systems (water transport, watering modes) do not always have desired efficiency. A part of water is not directly useful for the production for which it has been mobilized, even if the fraction of water which one describes as "losses" can have other utilities (use downstream, scrubbing of surplus salts, etc). It is thus important to set up modern irrigation systems, making it possible to satisfy the various uses and to make savings in water.

Definition:

This indicator is defined as the proportion of the irrigated areas which is equipped with modern irrigation systems.

Unit:

Percentage

Objective and/or targeted values:

To maintain the physical use efficiency high to 80%.

Methodological indications:

The modern irrigation systems correspond to the new techniques introduced into the agricultural sector: they include improved surface irrigation, sprinkler irrigation and localised irrigation. These modes of irrigation allow water savings in the irrigation perimeters, an increase in the efficiency of the irrigation to the plot of land and an increase in the crop output (market-gardening and arboriculture) with a possibility of generating important additional benefits for the farm.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
YES	YES	-	-	-	-

References:

Louati : rapport national de la Tunisie sur l'eau et le développement durable DG/GRHA-MARH_2004

International data sources:

FAO
CIEHAM-IAM

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Natural and technological risks
HUMAN AND ECONOMIC IMPACTS OF FLOODS	WAT_C05	

Strategic objective:

To decrease the vulnerability to the risks of floods and drought.

Rationale:

“Floods are the most common natural disasters in terms of economic losses and compensated disasters" (UNECE) and " an increase in the frequency of floods, droughts and other extreme events, due to the climatic change, is a considerable threat for national economies and sustainable development ” (UICN).

Definition:

This indicator is defined by human impact (number of deaths) and by the annual cost of floods expressed as a percentage of the gross domestic product (GDP).

Unit:

Numbers and Percentage.

Objective and/or targeted values:

Methodological indications:

The damage due to floods is divided into three main categories:

- Damage in the public area: cost of initial emergency aid, then cost of rebuilding of the public infrastructures (roadway networks, bridges, river management, local buildings, drinking water supply and sanitation networks,, etc.);
- Damage to the private sector (agriculture, craft industry, trade, industries, dwellings, and so on);
- Damage to the large semi-public companies.

The economic cost of floods must take into account both the material damage that took place at the moment when floods occurred and estimations in terms of slowing down of economic activity.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	YES	-	-	-

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Biological diversity, ecosystems 95
WETLANDS AREAS	WAT_C06	

Strategic objective:

To promote the integrated management of catchment area, including surface water and groundwater as well as eco-systems and to foster depollution objectives (to preserve water resources).

Rationale:

The wetlands constitute economic, scientific and entertaining resources of great value. They are subjected to many threats and their degradation leads to increasing risks of floods or droughts, and to a deterioration of the natural environment.

Definition:

This indicator measures the total area of wetlands in the country.

Unit:

Square kilometres or hectares.

Objective and/or targeted values:

According to the national objective

Methodological indications:

The wetlands correspond to level 4 of the standard statistical classification of the EEC-UNO on land use:

They include:

4.1 Paludous zones

Intermediate Zones between the solid state (ground closes) and the liquid state (water) to which the low peat bogs and the high peat bogs belong. According to their level, these zones can be flooded with more or less regular intervals. When they are not flooded, the soil is wet and spongy and the vegetation is made up mainly of mosses and other broken up vegetable matter.

4.2 Wet tundra

Non-wooded easily flooded grounds, of Arctic climate and vegetation, temporarily flooded
.

4.3 Other wetlands, n.d.a.,

Grounds of division 4 which are not included in the categories 4.1 or 4.2

Wetland area includes the area of national sites classified in the list of internationally significant wetlands in the RAMSAR Convention. The list of RAMSAR sites is updated every two years and can be obtained from the Convention secretariat (ramsar.org).

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	YES	-	-	-

References:

Eurostat/OECD Questionnaire
MedWet: Mediterranean Wetlands Initiative

International data sources:

Ramsar (ramsar.org)

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Biological diversity, ecosystems
WATER REQUIREMENTS FOR THE ECOSYSTEMS	WAT_C07	

Strategic objective:

To promote the integrated management of catchment area, including surface and, groundwater as well as eco-systems and to foster depollution objectives (to preserve water resources).

Rationale:

As one approaches the limits necessary for the maintenance of natural ecosystems, the existence of an "environmental request" (which includes water requirements to ensure the functioning of these ecosystems) is increasingly accepted.

Definition:

It is the ratio between the water "demand" for the functioning of ecosystems and the total water demand. Water requirement for the ecosystems is defined as the biological minimal flow or volume which permanently guarantees the life, the movement and the reproduction of animal or plant species which populate water, in particular rivers (excluding stagnant waters).

Unit:

Percentage

Objective and/or targeted values:

To maintain the reserved flow at the following levels:
1/10 of the average annual flow for all new installations;
1/40 for existing installations.
Or to be defined by the local authorities

Methodological indications:

To evaluate these requirements, the collection of environment quality elements concerned at different seasons is necessary. These elements can be of different kinds:

- Biological : watery flora (phytoplankton, etc), macro-invertebrates, fish ;
- Hydro-morphological (continuity, hydrology, morphology) ;
- Physicochemical (cf general water quality index).

The water requirements for ecosystems are very variable according to the aquatic environment concerned. It is thus necessary to be in a position to describe, even summarily, and to follow the evolution of the ecosystems concerned so as to be able to evaluate their requirements. It is to be stressed that these requirements are variable in time. Work was thus undertaken to model the hydraulic river comfort (in particular by the CEMAGREF in France), and was widened with several types of habitats.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
YES	YES	-	-	-	-

References:

CEMAGREF

International data sources:

Precaution for use:

In order to apprehend water demand for the ecosystem requirements, a lot of methodological work is still necessary, and observation and measurements networks must be developed. To begin with, it could be indicated if for rivers there is a reserved mode for the ecosystem requirements as well as the value of the latter.

Methodological appendix:

It is stressed that the constraints of reserved flow do not necessarily apply to the totality of a territory but only to the basins upstream of wetlands to preserve perennial water.

One could also point out that these ecosystem water requirements are connected with the human requests for water use in situ which are not taken into account in the total requests (the latter taking into account only ex-situ uses).
This would lead to extending the ecosystem concept to human activities in an aquatic environment (swimming and water sports, fishing, sailing, and so on).

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater et waste water 87
GENERAL WATER QUALITY INDEX	WAT_C08	

Strategic objective:

To promote the integrated management of catchment area, including surface and groundwater as well as eco-systems and to foster depollution objectives (to preserve water resources).

Rationale:

The deterioration of water quality is becoming a major concern in many countries. The surface water very frequently has high biochemical dissolved oxygen demands (BOD), strong phosphate contents, nitrates and heavy metals, and bacteriological local pollution is frequent. Groundwater is the most vulnerable, because its pollution is much more slowly reversible. Natural lakes and dam reserves are also threatened by eutrophizing, activated by the climate.

Definition:

An index of general water quality is defined according to the Quality Evaluation System (QES) for water, founded by the International Commission for Protection of the Moselle and the Saar in 1999. It relates to fresh surface and underground water.
It is built using the measurements of concentration of the pollutants (organic, nutritive, heavy metals, etc.), Confronted with limits in the classes, particularly ones established on the basis of a recommendation from the World Health Organization (WHO).

Unit:

Without unit (0 - 100)

Objective and/or targeted values:

To reach good condition[1] by 2015

Methodological indications:

The general principle of the QES is to evaluate water according to its physicochemical composition or according to the aptitude of water for different uses and for watery life. The measured concentrations are confronted with limits of classes, in particular established on the basis of recommendations of the World Health Organization (WHO) and converted into quality indexes. These indexes make it possible to judge water quality for a parameter, a deterioration (by retaining the weakest index obtained for all the deterioration parameters), or a group of deterioration (by retaining the weakest index obtained for the whole considered deterioration).
Each quality grade corresponds to a section of 20 % of index. The passage from one class to another takes place by the means of the thresholds defined below. Thus, we obtain the following distribution:

[1] the objective of good condition of aquatic environments by 2015 will have to correspond to a realistic quality and to allow for the largest range of uses, involving especially :

- The taking into account of the data concerning the economy and regional planning in order to lay down relevant objectives;
- the principle of non-deterioration of the resources;
- specific strategies such as for example the control of toxic pollution, the safeguarding of groundwater.

Index %	Colour	Quality and Aptitude
80 – 100	Blue	Very good
60 – 80	Green	Good
40 – 60	Yellow	Passable
20 – 40	Orange	Bad
0 – 20	Red	Very bad

The "general quality" index suggested here for a river, or an aquifer, does not refer to any particular use ; it integrates several criteria which describe an aquatic environment in overall terms ; all these criteria (organic and oxidable matters, suspended solids, salinity, nitrates, phosphorus, chlorophyll, metals) are integrated in a summary form of the quality grid defined at the national level. In this way, each sample taken and analysed in the field can, in accordance with the most downgrading criterion during analysis, be assigned to a quality class in relation to that grid. When there is an adequately large number of samples (over space and time), values can be interpolated, and water resources mapped each year in accordance with the various grids (by linear sections of river or by areas of homogeneous quality in water tables). If this data is available, statistics on changes in quality classes can be drawn up (e.g. what length of a watercourse went from one class to another, in any given period), even if these statistics may be difficult to apply to the volumes of water involved.

In this way, the suggested approach will initially consist in the setting up measuring stations at national level on representative sites (3 rivers and 3 water tables) and in presenting the measurement result time series, criterion by criterion, as an annual average. One can focus on a few criteria: Biochemical Oxygen Demand (BOD) or salinity for water tables.

PARAMETERS	Unit	PARAMETERS	Unit
Flow	m^3/s	Chlorophyll a (summer)	mg/l
Temperature	°C	Faecal coliforms	n/100 ml
Acidity	pH	Heavy metals	
Dissolved Oxygen	mg O_2/l	Total Arsenic	mg As/l
Oxygen Saturation	%	Total Cadmium	mg Cd/l
BOD (20°C,5 days)	mg O_2/l	Total Chrome	mg Cr/l
COD ($K_2Cr_2O_7$)	mg O_2/l	Total Copper	mg Cu/l
Suspended solid	mg/l	Total Lead	mg Pb/l
Dissolved solid	mg/l	Total Mercury	mg Hg/l
Total nitrogen	mg N/l	Total Nickel	mg Ni/l
Nitrates (NO_3)	mg N/l	Total Zinc	mg Zn/l
Ammonium (NH_4)	mg N/l	Cyanides	mg CN/l
Total phosphorus	mg P/l	Organic-chlorinated pesticides	mg/l
Ortho phosphate	mg P/l		

If this approach is interesting for any given measuring station, but with the limitation of presenting merely annual averages, it does not give any data on the overall health status of the aquatic environment since this depends on the selection by the stations.

geographical scope:

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	-	-	-	-

References:

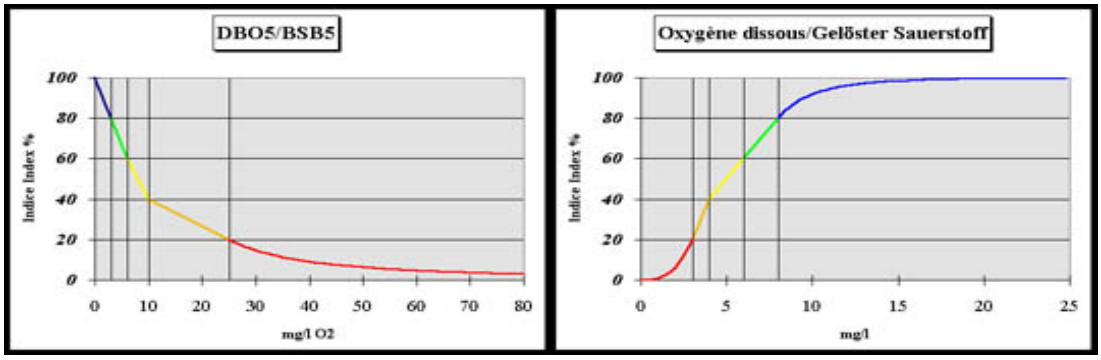
International data sources:

Precaution for use

To incorporate the values in space: quality varies very strongly according to the point of sampling:: upstream or downstream from a discharge, before or after dilution by junction.

Methodological appendix

Example of the construction of the relations “measured values//indexes” for two parameters:



The relations thus defined allow the conversion of the whole results of the various parameters (expressed in various units) measurements, into a set of indicators expressed as a percentage of the same interval (0%-100%). The second stage of the treatment consists in extracting a single value from deterioration index for a given withdrawal. This value is the index value of the lowest parameter quality among all those obtained for the considered withdrawal.

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater et waste water
EMISSIONS OF ORGANIC WATER POLLUTANTS	WAT_C09	

Strategic objective:

To promote the integrated management of catchment area, including surface water and groundwater as well as eco-systems and to foster de-pollution objectives (to preserve water resources).

Rationale:

The emissions of organic pollution by industrial activities are the principal causes of water quality deterioration.

In the northern Mediterranean countries, industrial waste has stabilized somewhat in the volumes of biochemical dissolved oxygen demand per year (BOD), and has even slightly decreased over the last 20 years, but it is in strong growth in the eastern and southern Mediterranean countries.

Definition:

Biochemical Oxygen Demand during 5 days (BOD_5) measured in industrial wastewaters multiplied by the average annual flow of the industrial wastewater discharges.
The BOD is the quantity of oxygen necessary for the destruction or the degradation of the organic matter in water, with the assistance of micro-organisms which develop, in conditions dependent on the environment.

Unit:

kg of BOD_5

Objective and/or targeted values:

To reduce pollutants from industrial sources, such as the reduction of BOD_5 by 50 %

Methodological indications:

Several processes make it possible to measure BOD_5:

The dilution method indicates the biochemical demand for the oxygen value from the difference between 2 oxygen quantity measurements realized before and after an incubation time of 5 days. This method is currently the officially recognized process.

In this method of dilution, widespread throughout the world, pressure in the measurement bottle falls after a number n of days, because of consumed oxygen. The prescribed measurement in the auto-control regulations for the treatment plant managers calculates the biochemical oxygen demand value (BOD_5), from the difference in measured pressure.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
YES	YES	YES	YES	-	-

References:

International data sources:

- World Bank, World Development Indicators 2005

Precaution for use:

Methodological appendix:

The biochemical transformations of the organic matter are carried out in two stages:

- the first stage being referred to the carbon compounds begins immediately and is completed with 20°C at the end of approximately 20 days ;
- the second stage being reported to the nitrogen compounds starts only at the end of ten days and extends over a very long period.

This satisfaction of the biochemical need thus continues during a rather long time and moreover, presents variations with the temperature. It was agreed to evaluate the biochemical oxygen demand during 5 days at 20°C, which one indicates by initials BOD_5. The result is expressed in oxygen mg/l consumed during these 5 days.

The determination of the biochemical demand for oxygen (BDO_5) is carried out in accordance with standard AFNOR T 90-103.

Another indicator of the organic pollution is the chemical oxygen demand (COD) which is measured by oxidation by a powerful chemical agent (potassium Dichromate). The quantity of oxidable matter (**OM**) is calculated by the formula: **$OM = (2 \times BOD_5 + COD)/3$**

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater et waste water 88
SHARE OF COLLECTED AND TREATED WASTEWATER BY THE PUBLIC SEWERAGE SYSTEM	WAT_C10	

Strategic objective:

To promote the integrated management of catchment area, including surface and groundwater, as well as eco-systems and to foster de-pollution objectives (to preserve water resources).

Rationale:

Considering the estimated increase in pollutant flows in the Mediterranean from 2025, combined with the current insufficiency of financial means allocated to their current treatment, the extent of the margins of progress remaining to be achieved in the sanitation of wastewaters can be evaluated. Indeed, as regards domestic wastewater, approximately 60 % of urban water is rejected without preliminary treatment into the Mediterranean sea.

Definition:

This is the proportion of wastewater produced that has been subjected both to collection from a collective network (from households, local authorities or industries) and has been adequately treated to allow its discharge into the environment without impact on human health or on the ecosystems, in reference to one specified year.

Unit:

Percentage.

Objective and/or targeted values:

According to the national objective

Methodological indications:

The indicator is calculated by the ratio of the volume of the treated wastewater to the total volume of produced wastewater:

(S2+I6)/(H1+I3)

S2: Wastewater connected to the public network and connected to the treatment plants (UWWTP)
I6: Industrial wastewater produced and connected directly to a UWWTP
(S2+I6): the volume of treated wastewater is the volume of water collected that is conveyed to other sites where it is treated (excluding treatment on industrial sites).
H1: Total of the wastewater produced by the domestic sector
I3: Produced industrial wastewater

The total volume of produced wastewater is equal to the volume produced by the domestic sector (H1) to which the volume (I3) produced by industries and not directly treated on site is added.
It is also possible to calculate it by multiplying the proportion of produced wastewater which is collected by the public networks (H2+I5)/(H1+I3) by the proportion of this wastewater collected by the public network which is connected to a treatment plant (S2+I6)/(H2+I5).

See the diagram in the methodological appendix

geographical scope:

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	-	-	-	-

References:

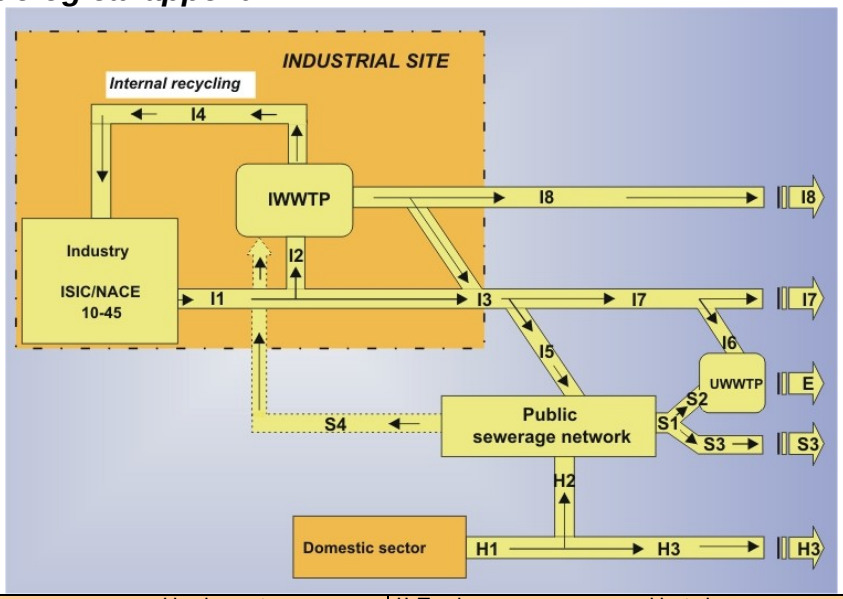
Eurostat/OECD Questionnaire

International data sources:

Precaution for use:

Information on the rate of collection and treatment of wastewater is very disparate and difficult to compare. The notion of treatment covers a wide range of processes that allow greater or lesser sanitation (mechanical, biological, biochemical and physicochemical).
Strictly speaking, the indicator should be weighted by the yield Ri for the various treatment plants i, in order to measure the actual percentage of domestic waste water (and industrial waste water connected to the domestic network) that has been subjected to adequate treatment to allow discharge into the environment without resulting in any environmental impact.

Methodological appendix:



H1 Total wastewater generated by domestic sector Total wastewater generated by domestic sector connected to public sewerage and discharged. H3 Total wastewater generated by domestic sector of which: not connected to public sewerage. S1 Total wastewater connected to public sewerage. S2 Total wastewater connected to public sewerage of which: connected to UWWTP. S3 Total wastewater connected to public sewerage of which: discharged without treatment. S4 Total wastewater connected to public sewerage of which: connected to IWWTP.	I1 Total wastewater generated by industry. I2 Total wastewater generated by industry connected to IWWP. I3 Industrially generated wastewater. I4 Internal recycling of wastewater. I5 Industrially generated water connected to public sewerage. I6 Industrially generated wastewater directly connected to UWWTP. I7 Industrially generated wastewater discharged without any treatment. I8 Total wastewater generated by industry connected to IWWTP discharged after treatment in IWWTP. E Discharges (effluents) of UWWTP.

Source: Eurostat/OECD Questionnaire

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater and waste water 91
SHARE OF INDUSTRIAL WASTEWATER TREATED ON SITE	WAT_C11	

Strategic objective:

To promote the integrated management of catchment area, including surface water and groundwater as well as eco-systems and to foster de-pollution objectives (to preserve the water resources).

Rationale:

Industrial wastewater still constitutes a very important polluting load (in concentration and in kind of products, and is increasingly complex). This industrial waste must be treated on site because of the complexity of the products it contains.
According to the existing inventories, less than half of the industrial liquid discharges in the Mediterranean countries are subjected to treatment and less than one third are treated before being discharged into the sea or rivers.

Definition:

This is the proportion of wastewater produced by industry and receiving autonomous treatment that is adequate to allow it to be discharged into the environment without impact on human health or ecosystems.

Unit:

Percentage.

Objective and/or targeted values:

According to the national objective

Methodological indications:

For the definition of the proportion of treated industrial water, this will be restricted to the volumes treated by direct connection to autonomous treatment plants, on site (excluding the volumes of industrial waste water flowing through collective networks, described in indicator WAT_C10).
The indicator then represents the ratio: I2/I1
(I1): total volume of wastewater produced by industry.
(I2): volume of industrial wastewater treated by non-public treatment plants (IWWTP).

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	YES	-	-	-

References:

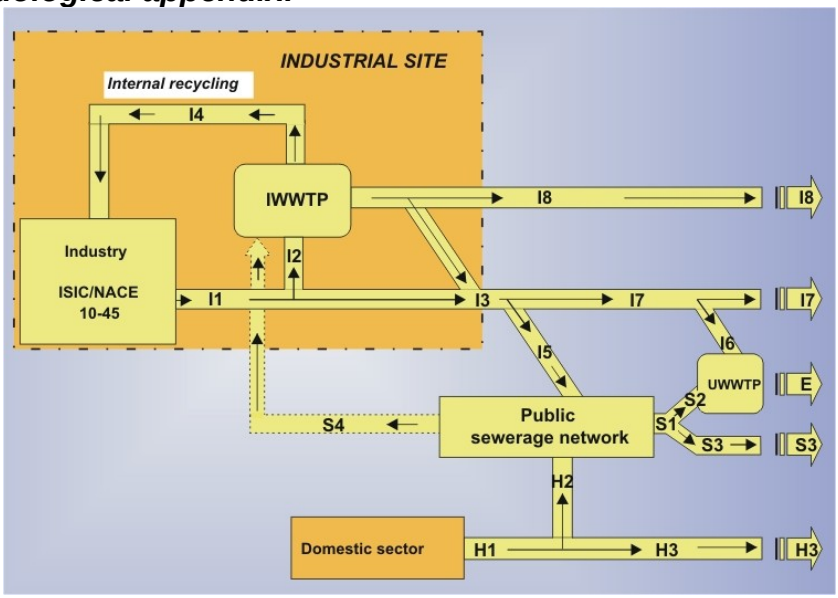
Eurostat/OECD Questionnaire

International data sources:

Precaution for use:

The notion of treatment covers a wide range of processes that allow greater or lesser sanitation (mechanical, biological, biochemical and physicochemical).
Strictly speaking, the indicator should be weighted by the yield Ri for the various treatment plants i, in order to measure the actual percentage of domestic waste water (and industrial waste water connected to the domestic network) that has been subjected to adequate treatment to allow discharge into the environment without resulting in any environmental impact.

Methodological appendix:



H1 Total wastewater generated by domestic sector	I1 Total wastewater generated by industry.
H2 Total wastewater generated by domestic sector connected to public sewerage and discharged.	I2 Total wastewater generated by industry connected to IWWP.
H3 Total wastewater generated by domestic sector not connected to public sewerage.	I3 Industrial wastewater generated.
S1 Total wastewater connected to public sewerage.	I4 Internal recycling of wastewater.
S2 Total wastewater connected to public sewerage of which: connected to UWWTP.	I5 Industrial wastewater generated connected to public sewerage.
S3 Total wastewater connected to public sewerage of which: discharged without treatment.	I6 Industrial wastewater generated directly connected to UWWTP.
S4 Total wastewater connected to public sewerage of which: connected to IWWTP.	I7 Industrial wastewater generated discharged without any treatment.
	I8 Total wastewater generated by industry connected to IWWTP discharged after treatment in IWWTP.
	E Discharges (effluents) of UWWTP.

Source: Eurostat/OECD Questionnaire

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater and waste water
WATER COST RECOVERY RATE (TOTAL AND BY SECTOR)	WAT_C12	

Strategic objective:

To implement appropriate fiscal and pricing systems as well as measures intended to encourage investments necessary for water demand management ; and to develop financial mechanisms in order to internalize external costs and anticipate the expected benefits from water-saving measures.

Rationale:

In the Mediterranean, among the range of the available economic instruments, the tariff system is the most employed, because of the need for recovering the service costs from the users. This is the case in all the countries. When there are other instruments (such as quotas or grants-in-aid), they are used together with the tariff system.

The current expected results of a tariff system cover the inciting aspects to reach a balanced resource management, while preserving objectives of intensification of the irrigated agriculture to meet national objectives for food security or balance in the equipments managers' budget.

Definition:

This indicator measures the water cost recovery rate (production, transport, distribution, exploitation and maintenance of the equipment), covered by the tariffs paid by users in the various sectors which profit from the service.

It can be calculated globally and by sector of use (agriculture, industry, local communities (including tourism)), but applies only to distributed and marketable water.

Unit:

Percentage

Objective and/or targeted values:

National objective

Methodological indications:

The water cost recovery rate generally includes:

- the recovery of production, transport and distribution costs,
- the recovery of public hydro-agricultural equipments costs as well as operating and maintenance costs for this equipment.

In addition, the country can specify the definitions used on a national scale.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	-	-	-	-

References:

- MCSD – Report of the « water demand management » workshop, Fréjus September 12 – 13, 1997 ;
- MCSD – Report of the « water demand management » workshop, Fiuggi October 3 – 5, 2002.

International data sources:

Precaution for use:

This indicator can apply only to the marketable water, distributed to connected users: major part of drinking water, but minor part of water used for irrigation. This part is null for the irrigation by groundwater as well as for water used by non connected industries.

In the case of non- marketable water, the cost is theoretically completely supported by the self-supplied users, except in the event of public assistance (e.g. preferential rate for electricity or remission of fuel tax for the farmers who pump water).

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ENVIRONMENT Freshwater et waste water
SHARE OF PUBLIC INVESTMENTS AND EXPENDITURE ALLOCATED TO WATER AND WATER DEMAND MANAGEMENT (WDM)	WAT_C13	

Strategic objective:

To promote the integrated management of catchment area, including surface water and groundwater as well as eco-systems and to foster de-pollution objectives (to preserve water resources).

Rationale:

Complementary to water supply policies (dams, pumping, long distance transfers , desalination, and so on), water demand management is a priority way to contribute to achieving two main objectives for sustainable development : evolution of the non-sustainable consumption and production modes on one hand, protection and sustainable management of natural resources for the purpose of economic and social development, on the other hand.

definition:

This indicator is defined by the amount of the public expenditure devoted to water, and the proportion allocated to water demand management (WDM).

The public expenditure devoted to water is the expenditure (state budget, self-financing or own resources from the sector) used to carry out actions such as : drinking water supply, hydro-agricultural equipments, sanitation, the fight against floods, basin planning, irrigation modernization, surface water mobilization.

WDM is defined by the whole set of measures aimed at reducing water losses and misuse and at increasing technical, social, economic, institutional and environmental efficiency in the various water uses.

Unit:

Millions of US$ and %

Objective and/or targeted values:

Methodological indications:

The public sector includes central and local administrations as well as local communities, so that public expenditure gathers both the expenditure of central and local administrations and the expenditure of local communities.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	-	-	-	-

References:

« A Sustainable Future for the MEDITERRANEAN : The Blue Plan's Environment & Development Outlook», Plan Bleu, 2005

International data sources:

Organisation for Economic Co-operation and Development (OECD)- Development Co-operation Directorate (DAC)

STRATEGY IMPROVING INTEGRATED WATER RESOURCE AND WATER DEMAND MANAGEMENT	TYPE : COMPLEMENTARY	MCDD ECHANGES AND COOPERATION IN THE MEDITERRANEAN Mediterranean cooperation in the fields of environment and sustainable development
PUBLIC DEVELOPMENT ASSISTANCE DEVOTED TO WATER AND PROPORTION OF THIS AID DEDICATED TO WDM PROGRAMS	WAT_C14	

Strategic objective:

To reinforce synergies with donors with the other executives of regional co-operation in order to support investments ; to promote active and interdependent cooperation for sustainable water management at local and national levels.

Rationale:

Among the existing means to finance water management, public development assistance (PDA) should be called to play a reinforced role to take into account the issues of long term and essential solidarity among users, territories and generations. The poor attraction of the sector for international private capital should be noted. Admittedly, the implementation of national intern mechanisms allowing the covering of investment and operating costs will eventually be the only guarantor for sustainable water management, but without international public assistance, many necessary investments will not take place.

Definition:

This indicator measures the amount of the public development assistance (received/given to the Mediterranean developing countries) devoted to water and the proportion of this assistance dedicated to water demand management (WDM) programs.

Unit:

Millions of US dollars and %

Objective and/or targeted values:

Methodological indications:

The considered PDA is the one devoted to actions such as drinking water supply, hydro-agricultural equipment, sanitation, the fight against floods, basin planning, irrigation modernization, surface water mobilization.
The WDM is defined by the whole measures aiming at reducing water losses and misuse and at increasing technical, social, economic, institutional and environmental efficiency in the various water uses.

Public development assistance received by the country includes:

- assistance / donations / grants-in-aid;
- subsidized loans (e.g. loans from the World Bank or the IMF).

It can come from multilateral or bilateral co-operation.

It can consist in direct financial transfers (food, equipment) or in fees paid to the experts based in the country (technical assistance). It would be appreciated if all these transfers could be converted into current equivalent USS.

Geographical scope

CATCHMENT AREA	NATIONAL LEVEL	MEDITERRANEAN COASTAL REGION (NUTS 3)	COASTAL STRIP	MEDITERRANEAN SPOT	MARINE AREAS
-	YES	-	-	-	-

References:

International data sources:

- Organisation for Economic Co-operation and Development (OECD)- Development Co-operation Directorate (DAC)
- multilateral donors (World Bank, African development Bank (AfDB), BERD, programs and agencies of the United Nations UNDP, international funds).

Precaution for use:

Private assistance (decentralized co-operation, NGO) is not included in this indicator because of the great difficulty to count it, but it can also be considerable.