

MEDSTAT II: 'Water and Tourism' pilot study

2009 edition

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MEDSTAT II started in January 2006 and seeks to:

- Harmonise statistical methods in Mediterranean partner countries in line with European and international conventions and standards.
- Improve the comparability of data between the partner countries and with those from EU Member States and EFTA countries.
- Enhance the quality of services offered to users by the National Statistical Institutes and their partner organisations involved in the production of statistics.

Special attention is paid to nine sectors: Trade in goods and services, National accounts, Social statistics, Energy, Agriculture (including Fisheries), Environment, Tourism, Transport and Migration.

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Introduction

The Mediterranean region is one of the world's top mass tourism destinations and tourist flows to this region are constantly increasing (4% of the world total in 1990 and 6% in 2005). The tourism trade benefits from the quality and variety of the region's natural heritage and landscapes. But its rapid development following the rise in the standard of living and increase in leisure time is taking a toll on the environment.

Tourism activities have two types of environmental impacts: those linked to tourist movements and those linked to the stay away from home. These impacts are greatly accentuated by their seasonal concentration (summer and school holidays) and spatial concentration (coast, mountains, individual towns and several major sites).

Tourist movements contribute to greenhouse gas emissions. These emissions reflect the growth of tourist mobility, with more frequent departures and shorter stays at more distant destinations. The tourism transport intensity (number of km travelled per night stayed) is increasing and the means of transport used is evolving more towards cars and aeroplanes.

Impacts related to the stay are linked to the use of tourism and leisure facilities (marinas, golf courses, etc.) and the building of tourist accommodation (second homes, hotels, campsites, etc.). Apart from the sprawl and artificialisation of landscapes, the high population density at holiday sites puts pressure on the water resources and natural environments.

Water resources in Mediterranean partner countries are limited and unequally distributed in terms of space and time, thus exacerbating the pressures. The population of partner countries 'poor in water', i.e. with less than 1000m³/person/year of renewable resources continues to increase. The demand for water, both renewable and unconventional (desalination, re-use of purified water, etc.) doubled in the second half of the 20th century¹.

Distribution of this resource among the various users is unequal, with the agriculture sector being the number one water consumer. With pressure on water resources continually increasing, distribution among users is becoming a cause for concern.

Consumption of water by the tourism sector is not well documented by statistics and at present it is difficult to assess the impact it has on water resources. The collection of data and the development of detailed statistics have become a necessity.

Are there any statistical data on this subject? What kind of data? How detailed is the information? Who produces it and how is it collected and made available?

These are the questions we have undertaken to explore in the 'water and tourism' pilot study conducted under the MEDSTAT II programme, environment and tourism section.

The study was ordered by the Environment Directorate-General of the European Commission and investigates, for four pilot countries (Israel, Jordan, Morocco and Tunisia), the use of water for tourism and the availability of statistical information on this subject. Its objectives are:

- to identify the relationship between tourism and the water management problem in the Mediterranean, by precisely defining the types of activity involved, their relationship with water (consumption, use) and thus the main challenges of this relationship;

¹ Source *Blue Plan*.

- to collect data on the use of water for tourism in the participating countries (Morocco, Tunisia, Israel, Jordan and Syria), in specific tourism sectors (hotels, golf courses, etc.), providing a breakdown per type of water resource (underground water, surface water and unconventional water);
- to make suggestions to improve the production, collection, dissemination and use of statistics on water and tourism.

An initial analysis of the situation, including an in-depth analysis of the situation in Tunisia, was carried out from October to December 2007 and the first results were presented at the 4th Conference of water managers in the Euro–Mediterranean countries and the countries of Southeast Europe in Bled in Slovenia on 10 and 11 December 2007².

The second phase (January to April 2008) of the pilot study is based on a series of fact-finding missions to the other pilot countries. These will assess the availability of information on water consumption in the tourism sector and collect data through contact and discussions with bodies in the tourism and environment field responsible for the management and use of water and tourism.

² See <http://www.semide.net/documents/meetings/fo1148169/4thWD-slovenia>

I. Water and tourism in the Mediterranean: the challenges

I.1 DEFINITIONS

International institutions³ define tourism as:

'all the activities carried out by people during their journeys and their stays in places outside their normal environment for a consecutive period not exceeding one year, for leisure, business and other reasons not linked to the exercise of a paid activity in the place visited.'

The United Nations produced the following breakdown of tourism in 1994⁴:

- domestic tourism, which involves a country's residents travelling within that same country;
- inbound tourism, which involves non-residents travelling in the country, and
- outbound tourism, which involves residents travelling in another country.

We can also break tourism down into categories that combine these three basic forms:

- internal tourism, combining domestic tourism and inbound tourism;
- national tourism, combining domestic tourism and outbound tourism and
- international tourism, combining outbound tourism and inbound tourism;

The international tourism category is the one that has been considered for this study.

Finally, international definitions also distinguish between overnight visitors and same-day visitors. The tourism field generally excludes same-day visitors, instead linking them to the leisure field.

Following these definitions, we can see that potentially there are a large number of activities linked to the tourism sector: they include accommodation, of course, but also catering, transport, leisure activities (visits to sites of interest, recreational facilities, shows, etc.), various types of shopping (souvenirs but also everyday shopping), services (postal, telephone, etc.).

The difficulty lies in assessing what part tourism plays in these activities, which are shared between tourism, leisure and everyday activities by households.

In any event, many of these activities have a significant impact on the environment. This is particularly true for transport, which is tourism's number one source of greenhouse gas emissions. But as regards water consumption, it is above all accommodation and leisure resources such as golf courses, swimming pools and other aquatic facilities that are concerned.

I.2 WATER AND TOURISM: THE CHALLENGES

The Mediterranean region is one of the world's top mass tourism destinations and the tourist flows to this region have increased from 4% of the world's total in 1990 to 6% in 2005. With the foreseeable growth in tourist flows in the region and the increase in the demand for water (above all for agriculture, but also for domestic use), management of the water resource is becoming a major challenge for Mediterranean countries and the tourism sector.

³ *Tourism Satellite Account: Recommended Methodological Framework, Commission of the European Communities, Organisation for Economic Co-operation and Development, United Nations and World Tourism Organisation, 2001*

⁴ *Recommendations on Tourism Statistics, United Nations and World Tourism Organisation, 1994*

1.2.1 Tourism as a consumer of water

In the Mediterranean basin, water consumption from tourism is relatively low compared to other sectors such as agriculture. According to existing estimates (Blue Plan⁵, estimates confirmed by field studies, see summary per country) water consumption associated with overnight hotel stays, which account for a large share of tourist traffic, is at most 4.5 % of water demand in Malta and Cyprus, and is around 2 % in major tourist destinations such as Greece and Tunisia. In countries with little tourism, it remains highly marginal: 0.1 % in Syria and 0.5 % in Israel for example.

The expected trend is for a rapid increase in such consumption, with the growth of tourist traffic (396 million international tourists expected in 2025 compared to 166 million in 1995), the increase in comfort requirements and the development of facilities to diversify tourism (swimming pools, golf courses, etc.).

The tourism sector poses some very specific problems in terms of water consumption:

- Seasonal concentration, the peaks coinciding with the period in which water resources are scarce (summer);
- A spatial concentration on the coast, on sites characterised by the scarcity of local water resources (islands), and often on sensitive natural sites.
- A tourist offer that is often based on facilities that consume an excessive amount of water, such as golf courses, swimming pools and aquatic centres;
- The above characteristics point to the need for additional infrastructure to transfer the water from the interior of the country, the increasingly frequent use of unconventional water sources (such as desalination in Malta, Balearic Islands and Djerba; re-use of treated waste water in Morocco, Tunisia, etc.) and the enlargement of water transporting systems and waste water treatment systems, due to the seasonal imbalance of tourist traffic. On the other hand, tourism could represent a rich source of income to improve the local populations' systems of water supply and sanitation (purification stations).
- Finally, we observe a frequent use of undeclared wells (not covered by official statistics), whether this is for watering gardens and green areas, golf course upkeep or other uses (cleaning of outbuildings, courtyards, etc.).

It therefore seems necessary to increase our knowledge of the impact tourism has on the management of water resources, to orientate tourism and environmental policies by means of arbitrage between sectors (agriculture, industry, use by households, hotel facilities, etc.), especially during droughts, or by developing differentiated rates or charges.

1.2.2 Water as a tourism resource

Tourism and the environment both have a keen interest in water. The water and tourism issue is not just a matter of the water consumption of overnight hotel stays and tourist facilities. Water is also an important tourism resource upon which the attractiveness of a destination may depend.

- Landscapes;
- Health and well-being tourism (balneotherapy, thalassotherapy, spas, etc.);
- Bathing in the sea or fresh water (rivers, lakes);
- Aquatic sports: canoeing, diving, windsurfing, sailing, etc.

⁵ *Dossier on tourism and sustainable development in the Mediterranean, MAP Technical Report Series #159, PNUE/PAM Athens 2005*

Water is not actually consumed here but tourism needs these water-based attractions (rivers, waterfalls, lakes, hot water springs, seaside, etc.), and can be affected when this attraction is reduced, for example owing to low water levels during the summer or to the poor quality of bathing water. In the high season, conflicts of use can also arise between the different sectors using the water resource, such as agriculture, hydro-electricity production and household consumption. It can then occur that tourist facilities are given priority in the supply of water, with agriculture and households having reduced access (water cuts, controlled volumes/rationing).

But tourism can offer a good reason for keeping water quality high in order to promote bathing or fishing. The organisations responsible for water management and local authorities are starting to take account of the impact water quality can have on tourism (see Text Box 1 below).

Text Box 1: The Blue Flag

The Blue Flag is a voluntary eco-label awarded to municipalities and marinas that have integrated the environment into their tourism management, one of the four main sets of criteria affecting water management.

This eco-label is applied in 36 countries — Europe, Morocco, South Africa, Canada, New Zealand and the Caribbean — and has become a mark of prestige in the fields of tourism, environment and sustainable development.

Such was the success of the Blue Flag that in France it was extended to internal waters in 2002 and the Foundation for Environmental Education (FEE⁶) is working to enlarge the scheme to include the rest of the world with the United Nations Environment Programme and the World Tourism Organisation.

Website: <http://www.blueflag.org/>

1.2.3 The Mediterranean region and climate change: a challenge for tourism

Considerations relating to water resources worldwide and in the Mediterranean regions in particular must be correlated with studies on the impacts of climate change.

According to IPCC⁷ forecasts, the Mediterranean region is particularly vulnerable to climate change, especially where water resources are concerned. A decrease in precipitation and greater inter-annual variability are considered very probable in the region.

The main risk identified, beyond the supply of drinking water, is a decrease in the availability of water in general (more droughts and worse floods). All these manifestations of climate change combine to exacerbate the Mediterranean's already acute fresh water problems: increased evaporation, depletion of resources, salination of coastal aquifers.

Thus, a reduction in the availability of water resources, especially in summer, is expected in several Mediterranean regions and may have a variety of impacts on the tourism sector related to access to drinking water, threats to aquatic activities such as lake tourism or river canoeing, changes in attractive natural and agricultural landscapes and an increase in forest fires, accompanied by increased risks to activities such as camping and trekking. Disputes are possible between local populations and the tourism sector over access to water (for example: problems of golf courses, aquatic parks, etc.). The pressure climate change exerts on attractive ecosystems will endanger related activities (diving, etc.). Among such adverse effects, the increase in water

⁶ Foundation for Environmental Education (FEE) is a non-profit, non-governmental organisation, promoting sustainable development through environmental education.

⁷ Intergovernmental Panel on Climate Change.

temperature could lead to an increased presence of jellyfish. Finally, the forecast rise in sea level, associated with other natural or manmade phenomena, will threaten a number of coastal tourism resources and beach infrastructures⁸.

I.3 THE STATISTICAL CHALLENGES

From a statistical point of view, the challenges have to do with the coverage and availability of information.

Currently, in all countries, statistical information on the nature, level and impact of tourism is based primarily on the international arrivals and bed-night figures and balance of payments data. This has been confirmed during missions to the participating countries.

Accordingly, tourism statistics are generally limited to the hotel and catering sector, well identified in national and international classifications. Although catering is problematic, the hotel business is essentially a tourism business. Existing surveys on this sector provide us with figures on tourism activities.

However, the tourism statistics available at present do not allow us to depict the economic phenomenon of tourism as a whole and do not permit more detailed study of all tourism activities:

- the existing statistical information does not cover the whole tourism sector and is focused on accommodation and tourist flows;
- the remainder of tourist activities (catering, leisure facilities and activities etc.), by their very nature more diffuse and not strictly touristic, are not currently covered by statistics;
- collection of more comprehensive information is currently difficult or even impossible due to the absence of any precise, documented identification of the tourism sector in national and international classifications.

This general observation applies to the entire study area. Statistical knowledge is even more limited when we attempt to relate tourism to water consumption.

At a time when environmental questions are proving increasingly significant, governments, local authorities and tourism companies do not have the statistical tools to assess and monitor the impact of tourism on water resources and more generally on the environment and natural resources. It is therefore necessary:

- for states and local authorities: to know what the water consumption of tourism is, its seasonal distribution and its breakdown in terms of the different water resources and the different sub-sectors of tourism (accommodation, facilities, activities, etc.) in order to define priorities for water saving or demand control programmes;
- for tourism companies: to have access to reference values (benchmarks) to enable them to compare their consumption with that of similar undertakings, to define their priority actions (water consumption of hotel rooms, gardens, support facilities, etc.), to keep track of their own performance and to implement appropriate management strategies.

⁸ *Regional study 'Tourism and climate change in the Mediterranean: challenges and perspectives', Blue Plan, workshop July 2008*

II. Statistical inventory

This section will round up the statistics situation in the countries taking part in the study on the basis of the preliminary study and field surveys.

The fact-finding missions — 4 days on site per country — were organised in collaboration with the (environment and tourism) statistical institutes of the participating countries. The missions were based on meetings with national and primarily institutional bodies only (no meetings in local offices).

This issue of the relationship between tourism and water being quite new and never before having been the subject of a study, we encountered several difficulties in preparing and executing the missions:

- Difficulty in identifying good interlocutors beforehand in order to schedule meetings before arriving onsite. Organising meetings onsite proved complicated in the institutional structures;
- Complexity of official structures (ministries and central agencies) responsible for water. The roles and missions of each structure are not always clear, even for the statistical institutes, which makes it difficult to identify appropriate interlocutors with whom to meet;
- Reluctance of certain structures to provide access to databases.

The points evidenced in the initial investigations based on a bibliographic analysis of the entire Mediterranean basin were confirmed in the fact-finding missions, although modifications were needed for some countries.

II.1 DIFFICULTY OF OBTAINING EXISTING STATISTICAL INFORMATION

The fact-finding missions confirmed the observation that the fact that a datum cannot be collected does not necessarily mean that it doesn't exist.

Indeed, although sometimes the information sought does exist, it is not always available in statistical form and accessible to external users. Where the datum exists, it is rarely collected regularly and continually, or in a centralised manner. The sources of the data are often missing and the collection method is not described.

Existing data is not always published or disseminated and is often restricted to internal (management) use by the body that produces them. Official bodies do not yet appear ready to provide easy access to the information sought.

II.2 'WATER AND TOURISM' STATISTICS NOT YET ASSEMBLED

The preliminary analysis, confirmed by the fact-finding missions, shows that there are currently no complete, reliable statistical data on the tourism sector's water consumption. Only Tunisia, because its economy is largely based on tourism and it has highly centralised water management, has drawn up statistics including the water consumption of the tourism sector.

All the countries covered by the study have introduced a specific water rate for tourism establishments (mainly hotels), enabling them to rationalise water demand by means of a graduated and segregated rates policy. Rates are applied per broad user category as a function of volumes consumed. In Tunisia, for example, the current rates system for drinking water is graduated according to use and water consumption band. The differentiation by use allows for three categories: domestic, public, trade and industry; tourism (hotel business); and standpipes. The highest rate is applied per m³ of water supplied to hotels.

In theory, water supply systems with differentiated rates like this should enable us to identify at least part of the tourism sector's water consumption. In practice, this datum is not always computerised, is rarely put in statistical form and appears never to be verified or recorded by state statistics departments.

According to the people we interviewed in the central water management authorities, local supply services do have this information, but it is not collected for statistical purposes or centralised.

This rates regime has only been implemented recently, which explains why the useful information that could be drawn from it has not yet been collected. Furthermore, this measure is only applied to graded hotels⁹, once again limiting coverage of the tourism sector to accommodation and more specifically to graded accommodation. For other activities (restaurants, golf courses, spas, etc.) information does not exist because it has not been separately identified, but has been grouped with 'domestic' consumption.

Finally, the structures of the databases used by water supply services and in particular the classification of large consumers (customers) are not always compatible with the economic activities classifications used by the national statistics institutes. This makes it difficult for statistics institutes to collect and assess these data.

The only data we were able to identify and collect during the fact-finding missions are set out below:

A - Total hotel water consumption

This information sometimes comes from economic audits (Morocco, Jordan). In these, reported consumption is estimated in monetary terms and not in terms of volume (Table 1). Water supply bodies (such as the Water Authority in Israel and the SONEDE in Tunisia) provide an estimate of water volumes consumed by hotels as a percentage of total consumption. In Jordan, the Department of Statistics (DOS) uses existing surveys to draw up estimates of the volumes of water consumed by hotels and restaurants (Table 2).

These figures are to be used with care, as neither the subject — tourism sector, hotel, etc.— nor the term 'consumption' are precisely defined by the producers of the data. It is thus difficult, for example, to assess whether the tourism sector as defined by the SONEDE in Tunisia is identical to that defined by the National Statistical Institute. Which hotels are taken into consideration in Jordan, Morocco and Israel (only graded hotels, club hotels included, etc.)? For water consumption, it is also difficult to assess whether this corresponds to total demand, i.e. to the supply of water by water distribution and supply services, including losses of water during transport (evaporation, leaks, theft) and direct water collection by users (self-supply).

A large number of hotel owners have their own wells, whose water production is not necessarily automatically recorded by water distribution bodies. For example, in Tunisia, 36% of hotels have wells. The user does not always know what volumes are pumped and they are not recorded by the Direction Générale des Ressources en Eau (DGRE study, 2000). Use of underground water is mainly reserved for toilets and gardens (water quality not guaranteed, unlike that of the public network). However, for certain hotels with an inverse osmosis station (desalination of salt water), underground water consumption can exceed 60% of the hotel's water needs.

⁹ A graded hotel is a hotel that has been registered with the local authorities in the place where it is located and that conforms to the standards of one of the grading categories defined in the country.

Table 1: Jordan: Annual water expenditure of hotels, campsites and other short-stay accommodation (thousands of JD)

Year	Total annual expenditure
2000	2 680.1
2001	2 322.1
2002	2 237.8
2003	2 299.8
2004	2 813.8
2005	3 664.1

Source: DOS

Table 2: Jordan: Estimate of the water consumption of hotels and restaurants from 2001 to 2006

Year	Total supply (million m ³ /year)	Water supplied to hotels and restaurants (million m ³ /year)	Volume of waste water produced (million m ³ /year)	Share of hotels and restaurants in the total supply (%)
2001	774	2.6	1.3	0.3
2002	810	2.7	1.3	0.3
2003	811	2.7	1.3	0.3
2004	866	3.0	1.7	0.4
2005	941	4.0	2.1	0.4
2006	925	4.3	2.4	0.4

Source: DOS calculation

Table 3: Estimates of the volumes of water consumed in certain Mediterranean countries

	2000	2001	2002	2003	2004	2005	2006
Estimate of water consumption (million m ³ /year)							
Jordan (hotels and restaurants)	:	2.6	2.7	2.7	3.0	4.0	4.3
Israel (hotels)	:	:	:	:	:	:	12.0
Tunisia (hotels)	17.7	18.0	16.1	15.1	17.5	:	:
Occupied Palestinian territory (hotels)	:	:	:	:	:	:	2.2
Share of total water consumption (%)							
Jordan (hotels and restaurants)	:	0.3	0.3	0.3	0.4	0.4	0.4
Israel (hotels)	:	:	:	:	:	:	0.5
Tunisia (hotels)	:	:	:	:	:	:	1.0

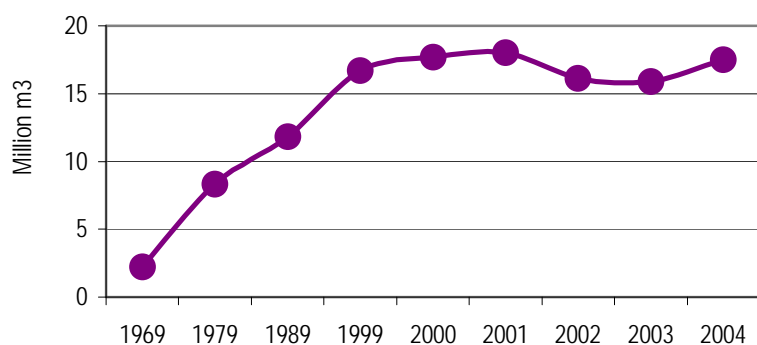
Sources: DOS, Israel Water Authority, SONEDE, PCBS

Table 4: Morocco: Turnover and water consumption of hotels and restaurants in 2004

Category (hotels and restaurants)	Turnover (000 dirham)	Water consumption (000 dirham)	% of turnover
Hotels	9 254 668	143 139	1.55
Other accommodation	78 353	436	0.56
Restaurants	1 928 652	34 136	1.77
Cafés	702 103	12 926	1.84
Total	11 963 775	190 637	1.59

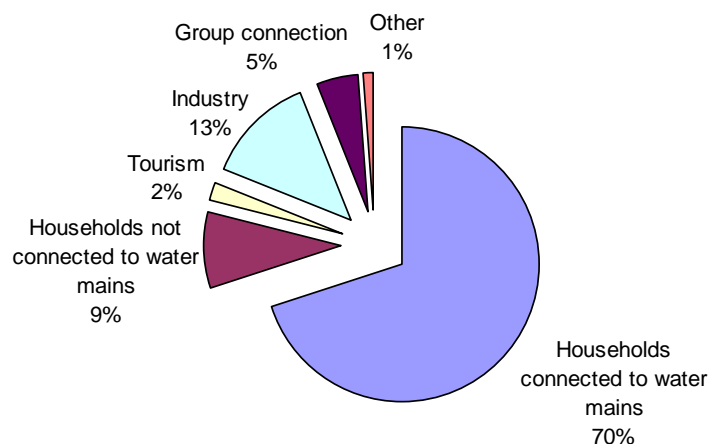
Source: HCP, structural survey carried out in services in 2005/2006 for 2004

Figure 1: Water consumption of hotels in Tunisia (million m³/year)



Source: SONEDE

Figure 2: Volume of water consumed by type of use in 2006 in Tunisia (in %)



Source: SONEDE

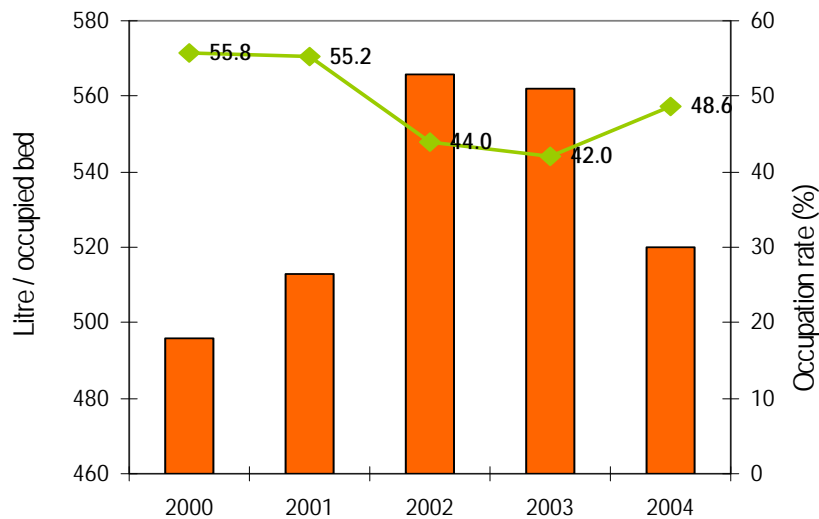
Tunisia has conducted an interesting study on water consumption in hotels in connection with the occupation rate. It shows that consumption depends on two components:

- A fixed quantity corresponding to the watering of gardens and cleaning, which does not depend on occupation;
- A variable quantity directly linked to the occupation rate.

In Tunisia, the average consumption per bed-night was estimated at 466 l/bed-night in 2002. We stress that this consumption is that recorded by SONEDE, the main drinking water supplier in Tunisia, and does not include the private tapping of water from groundwater or desalination. Furthermore, specific consumption in seaside areas is estimated to be 34% greater than the national average specific consumption.

The tourism sector in Tunisia is supplied 67% by SONEDE and 33% by direct tapping.

Figure 3: Water consumption and occupation rate of hotels in Tunisia



Source: SONEDE

B - Hotel water consumption ratios

For tourism companies, the development of environmental management programmes, such as those introduced by the European Union, have produced a set of reference values on the unit consumption of accommodation (benchmarks), which are generally not public (hotel chain management data) and not specific to the climate or to the Mediterranean tourism product. Knowledge of the unit consumption of facilities (golf courses, spas, etc.) is still highly underdeveloped in the European Union and in other Mediterranean countries. This information does exist in Morocco. Israel studied the possibility of determining these ratios but has decided not to go ahead, as their calculations were unacceptable because the influencing factors were too numerous (degree of comfort, type of clientele, geographical area, services available, etc.).

Table 5: Morocco: Water consumption standards by accommodation

Water consumption standards in Morocco (litre/bed-night)	
Luxury 5-star hotel	600
5-star hotel	500
4-star hotel	400
3-star hotel	300
Ryad, equivalent to 5-star	500
Villa	300
Holiday village, equivalent to 4-star	350
Aparthotel	250
Apartment	180

Source: ONEP, Department of Strategy and Development

Looking at the standards proposed by Morocco, we observe that they are the same as those calculated for Germany, for example (*Mutschmann et al. 2002*):

Table 6: Water consumption standards in Germany (litre/bed-night)

Luxury hotel	600
Hotel	375
Simple hotel	150

On the other hand, in the basin as a whole, the Blue Plan estimates the average consumption of hotels at 250 l/bed-night, which appears to be an underestimate in view of the ratios established in Morocco and Germany.

It is also useful to compare these ratios to those established for domestic water use:

- In Germany (*Mutschmann et al. 2002*), the average consumption of households is evaluated at 130 l/person/day (47 m³/year)
- In France, it is evaluated at 150 l/person/day
- in Australia (according to national water records), it stands at 282 l/person/day (103 m³/year)

Water consumption by hotels is far higher than household consumption, due largely to the collective consumption of water in hotels (watering of gardens that must be kept attractive, daily cleaning of rooms, filling of swimming pools, kitchen and above all, doing the laundry). Furthermore, holidaymakers have a 'pleasure' approach to the shower or bath and generally use more water than they would normally.

The distribution of water consumption points in a hotel — and their respective figures — is little known and depends largely on hotel practices.

Tunisian¹⁰ and Israeli¹¹ studies have focused more specifically on the distribution of major water consumption points in hotels. In the Tunisian study, the watering, swimming pool, hot water production and losses are the most important items (22, 13, 13 and 17% of total consumption in 2003).

¹⁰ *How to reduce water consumption in the tourism sector in Tunisia: approach and strategy*, R. Lahache Gafrej in the Workshop: Management of water demand in the Mediterranean, progress and policies, Zaragoza, March 2007.

¹¹ *Water conservation in Hotels*, translated from Yeheskel Cohen, Ministry of National Infrastructures, Israel Water Commission, Division for the promotion of water saving.

According to these studies, whatever the size and characteristics of the hotel, water consumption is divided into at least six categories: room, kitchen, laundry, air conditioning (cooling tower), swimming pools and gardens. Losses, linked to the network and to facilities, are generally considered according to the category in question and not as a category of their own.

C - Rates of water consumption of tourism activities, such as golf courses

A few water consumption rates for golf courses are available (Table 7). In Morocco and Tunisia, golf courses are mainly irrigated with treated wastewater.

Table 7: Estimate of the water consumption of golf courses

Water consumption standards in Morocco (m³/day)	
18-hole course	3 500

Irrigation of golf courses in Tunisia, 2006			
Course	Surface area (ha)	Irrigable surface area (ha)	Volume of water reused (m ³ /day)
Carthage	30	18	600
Yasmine Hammamet	80	45	1 800
Citrus Hammamet	172	90	2 700
El Kantaoui – Sousse	132	110	3 456
Flamingo Monastir	80	60	1 900
Palm Links Monastir	80	50	2 200
Jerba	92	44	1 500
Tabarka	110	45	1 500
Tozeur	150	75	:

Furthermore, in Tunisia SONEDE estimates that watering of hotel gardens and green areas accounts for 22 % of their total water consumption.

Few studies are available on this subject. The Jordan Hotels Association (JHA) has indicated that it is preparing a study on the impact of increasing energy costs on the tourism sector, including a part on water management.

Beyond a direct statistical approach, such studies, while still a rarity, could enable us in future to understand and qualify the water consumption of tourism and to build up statistics on the subject.

II.2.1 Tourism statistics: much tourism consumption in the informal sector eludes statistics

A great deal of tourism consumption in the informal sector eludes statistics, given the significant share of ungraded or informal accommodation, especially for domestic tourism.

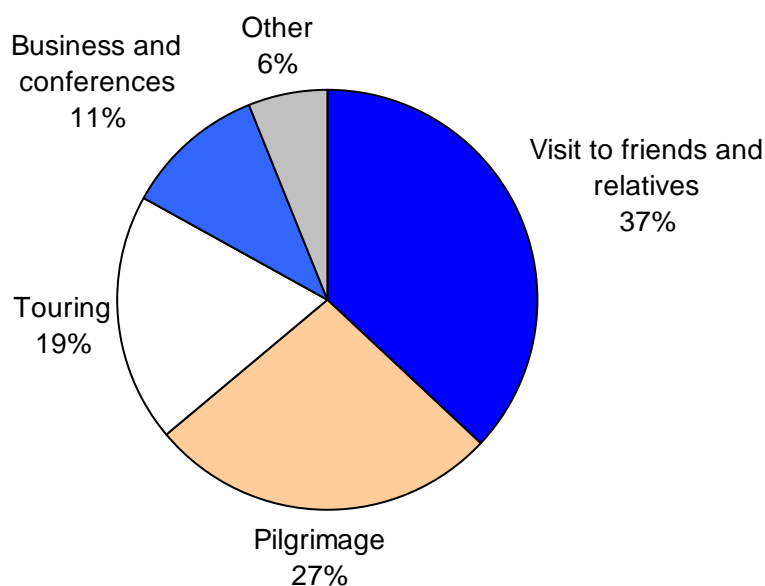
Entire sections of the tourism industry elude statistical observation.

The hotel business is generally constituted by a share of graded establishments, which are known and recorded, and also a share of ungraded establishments, recorded little or not at all by tourism authorities. For this ungraded hotel sector, data are sparse or non-existent.

There is no statistical coverage of non-market tourist accommodation (staying with family or friends) either. But this is also often the case with rented apartments or villas, rural bed and breakfast tourism and campsites.

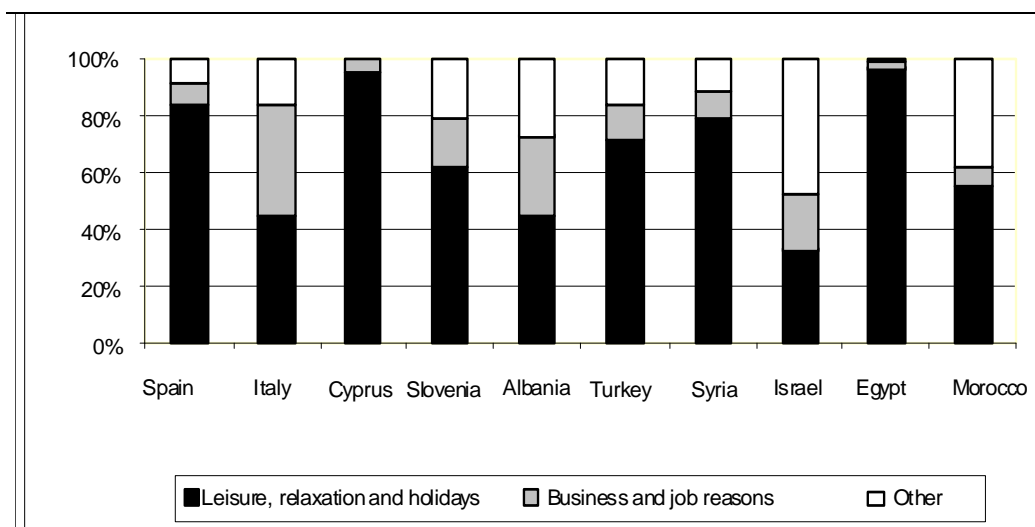
Also, the characteristics of the tourism sector vary from country to country: tourism in Tunisia is mainly hotel and club tourism, which, via graded accommodation, gives quite a complete picture of the tourism sector. On the other hand, in Israel tourism is often based in the informal/non-market sector with the majority of tourists staying with family or friends.

Figure 4: Tourism in Israel by visit purpose in 2006



Source: Israeli Central Bureau of Statistics

Figure 5: International arrivals by reason for visit in 2001 to certain countries of the Mediterranean basin



Source: WTO

II.2.2 The tourism sector is poorly identified

As we have already mentioned, tourism is rarely — if ever — identified as such in statistics on countries' water demand. The fact that it is dispersed throughout the various branches of the economy makes it difficult to get an overall picture.

This dispersion also depends on national situations. As we have seen in Tunisia and Morocco, the graded hotel sector provides a good basis for characterising the tourism industry. On the other hand, this is not the case in other countries where informal/non-market accommodation (rented apartments, bed and breakfast accommodation) is more widespread.

In all countries, tourism facilities and activities are not generally covered by statistics because they are not identified as such in the national classifications. Statistics on tourism do not cover these facilities (swimming pools, golf courses, spas, etc.) although they are potentially very significant water consumers.

For accommodation, even graded accommodation, statistics do not cover specific facilities such as swimming pools and spas. It is therefore not possible to quantify these facilities.

Facilities not directly attached to hotels are also unknown insofar as they are not identified as tourism activities in their own right but as facilities with a combined leisure and tourism purpose.

Only golf courses are sometimes identified by tourism authorities. This is the case in Tunisia. In Morocco they are not considered to be tourism facilities and do not appear under this heading. In Israel and Jordan, they are currently very little developed (Table 8).

Table 8: Number of golf courses

Tunisia	9 golf centres (11 courses)
Morocco	17 golf centres (19 courses)
Israel	2 golf centres (2 courses)
Jordan	1 golf centre (1 course)

Source: Authors

II.2.3 A wealth of tourism statistics yet to be developed

Although the economic importance of tourism varies in the four countries studied, all of them have drawn up statistics covering the tourism sector. However, this information is as yet not used to better comprehend the impact this activity has on the environment.

These tourism statistics provide useful historical depth and above all the data are readily available (regularly disseminated on the authorities' websites). The information available in all the countries covers:

- The number of arrivals, per nationality;
- The number of bed-nights;
- The number of graded establishments and the number of beds, per accommodation type and level of comfort;
- The occupation rate.

The data¹², available for graded hotels at least, are considered sufficiently complete and reliable by the authorities concerned.

II.3 STATISTICAL INFORMATION ON WATER IS LARGELY UNAVAILABLE

In all the countries studied, water management is considered a national priority. The scarcity of the resource in the Mediterranean region, especially in some of the countries studied (Jordan and Israel), makes focused, specific management by the public authorities a necessity. Therefore data on water resources and quality management are collected in a detailed manner (with daily monitoring of production infrastructures, for example, and water quality measuring networks). These detailed data are not always made public and are mostly used internally by the national and local structures directly responsible for water management. The published data mainly concern the quality of the water supplied.

While Tunisia has a highly centralised organisation to manage its water resources, other countries work with private or public corporations and franchisees. We only met with national authorities during the missions and it was therefore not possible to check the information available at decentralised services and private structures. In Morocco and Jordan in particular, we were able to collect very little data.

In any case, a large share of water consumption eludes statistics given the widespread use of private wells. In all the countries, water is supplied by means of the public network along with public or private wells. According to the literature and the persons interviewed, there appear to be a significant number of informal wells (for agriculture, household use and also by the tourism sector) that are not covered by the official statistics. This especially applies in Morocco and Tunisia, while in Israel and Jordan all private wells must by law be fitted with a meter, thus reducing the proportion of illegal wells.

¹² These statistics are regularly exchanged between Mediterranean partner countries and Eurostat as part of the MEDSTAT II programme.

III. Summary per country

Here we present brief summaries of the missions to the participating countries.

III.1 ISRAEL

III.1.1 The country's characteristics

In Israel, tourism activity is closely correlated with the country's geopolitical situation. For this reason it is not appropriate to compare sets of statistics covering several years, as the movements are highly affected by political events and are therefore not linear. Over one year, seasonal peaks do exist but are less marked than in the other countries insofar as different forms of tourism (religious tourism, family reunions, organised trips, etc.) take place all year round.

According to statistics available on accommodation (publications of the Central Statistics Bureau), the total capacity of tourist accommodation in 2006 was 170 000 beds. Hotels ('tourist hotels' recommended by the Ministry of Tourism) account for 80% of bed-nights and rural tourism (kibbutzim and moshavim) account for 9% of bed-nights.

The water question is crucial in Israel, where water resources are particularly scarce. The massive use of surface water pumped from the Sea of Galilee has considerable environmental and social impacts, such as drying up of the Jordan and the Dead Sea, and tensions with neighbouring Jordan, which also depends on this resource.

III.1.2 The situation from a statistical point of view

Statistics are available on both international and domestic tourism, but they mainly cover hotels and rural tourism. Little is known about other types of accommodation, linked for example to religious congregations. And insofar as 37% of tourists are visiting family and friends, the non-market accommodation quota is high even if there is no figure available to confirm this. However, the water consumption of these tourists, although it contributes to the increase in the total demand for water, is far lower than that of hotel tourists.

Tapping of water is closely monitored, including private wells. Two-thirds of production and distribution are managed by a public company. The remaining third is managed at a regional level based on private wells and supply to cooperatives and communes.

Data on water resources (resources, consumption and quality) do exist but not with the level of detail we are seeking. The work currently in progress to introduce water accounts is moving towards greater unbundling of activities, in particular of the tourism sector. On this subject, a proposal has been made by the MED countries to adapt the standard water account tables.

Differentiated water rates for tourism establishments do provide us with a way of approaching the 'water and tourism' problem, but currently only a total water consumption figure is available for the hotel business. The water authority has conducted a study to determine standards of consumption per bed-night, but abandoned it, concluding that it was impossible due to the high number of influencing factors (level of comfort, type of clientele, geographical area, services available, etc.).

III.2 JORDAN

III.2.1 Characteristics of the country

According to the statistics available on accommodation (Ministry of Tourism and Antiquities), the total capacity of tourist accommodation in 2006 was 43 000 beds in fewer than 500 establishments. Graded hotels account for around two-thirds of available beds. Tourists from neighbouring Arab countries and non-resident Jordanians account for two-thirds of tourists, staying in their own apartments (second home) or with family (non-market accommodation).

Water resources are a major challenge in Jordan, which is one of the world's 10 countries with the most meagre water resources.

In Jordan tourist traffic is an important factor, putting increasingly critical pressure on water resources. From the economic point of view, Jordan favours increased tourism, but this poses a real problem in terms of natural resource management. Jordan is experiencing a chronic water deficit, which is extreme this year. The increase in demand for water, partly linked directly to tourism, calls for costly investment decisions (additional desalination units, which are high energy consumers) and consumption control policies that are difficult to implement.

III.2.2 The situation from a statistical point of view

The large proportion of non-market tourism accommodation complicates the production of tourism statistics. However, an in-depth study on international tourism was conducted in 2006-2007 to examine tourist behaviour. Tourist water consumption was not included in this survey, but its results (characteristics of tourism, purpose of visits, etc.) are very useful for working out consumption ratios. Far less is known about domestic tourism, but a similar survey is planned for 2008-2009.

Water tapping and supply are managed at a regional level by public or private companies. Water is supplied either via a public network or from private wells, privately or by companies transporting and supplying from reservoirs. In all cases, tapped volumes are strictly monitored and the data is centralised by the Ministry of Water and Irrigation. However, we were not able to gain access to or collect this data during the fact-finding mission.

There is a differentiated rate for hotels. It is mainly applied in cities by the services responsible for zones in which graded tourist establishments are concentrated. In rural areas, this rate is difficult to apply, given the informal nature of tourism business there.

The information from these differentiated rates is a useful source of data, but is still problematic, because it is not centralised and because different grading systems and degrees of aggregation of the information are applied in different areas. The only figures available are those from the authorities' surveys, which give monetary values and not the volumes consumed.

Having now been alerted to the 'water and tourism' challenges, the Department of Statistics (DOS) has decided to concentrate more specifically on this issue and plans to carry out a pilot survey of hotel establishments (see Part IV Recommendations).

III.3 MOROCCO

III.3.1 Characteristics of the country

According to the statistics available on accommodation (Ministry of Tourism), the total accommodation capacity in 2006 was 133 320 beds in 1 354 establishments.

Graded hotels account for 74% of the tourist accommodation capacity and 92% if we add the holiday villages and tourist residences equated with this category. Tourism is highly concentrated in Marrakech and around Agadir.

Water is distributed by private companies and local authorities (franchises and corporations) in the main conurbations (i.e. for the main tourism zones) and by the national ONEP agency in rural areas.

III.3.2 The situation from a statistical point of view

Monthly surveys are carried out in graded establishments and are a good basis for acquiring knowledge of tourism activity.

Detailed statistics on water resources do exist (level, availability, quality, etc.) but they are not made available on a regular basis. Furthermore, the level of detail (in particular, per type of economic activity) does not meet the requirements of a tourism approach, since the tourism sector is not separately identified.

Morocco has also developed a variable rate (per band). This rate, especially in rural areas where districts are responsible for the supply of drinking water, can take various forms: volumetric or flat-rate, or even free for 5 % of rural districts. The Local Authorities Directorate-General conducts surveys of rural communities with questionnaires on water consumption. As we did not meet with this service, we could not obtain the data collected in these surveys.

The only figures available are those from the authorities' surveys, which give monetary values and not the volumes consumed.

III.4 TUNISIA

III.4.1 Characteristics of the country

Water and tourism are high priorities for Tunisia. A hotels modernisation plan was drawn up in 2002 and concentrates particularly on water and energy management systems. Regular audits are now mandatory for hotels, with a technical diagnosis of their installations. A consumption objective of 300 litres per day and per occupied bed has been set.

According to the statistics available on accommodation (Ministry of Tourism), total accommodation capacity in 2006 was 230 000 beds at 825 establishments (the highest in the region). Graded hotels account for 90 % this capacity, rising to 94.5 % with holiday villages.

Water management in Tunisia is centralised at the Office National de l'Assainissement (ONAS) and the Société Nationale d'Exploitation et de Distribution de l'Eau (SONEDE). The water supplied by SONEDE is the primary resource of accommodation units, but hotels are also supplied from other sources such as wells and desalination units (salt water or sea water), which are not always 'identifiable'. A total of 1436 hotels and similar establishments subscribed to the SONEDE in 1999.

III.4.2 The situation from a statistical point of view

The graded hotel sector is considered in Tunisia to be a good basis for observing tourist activity as it represents practically the only tourism product the country has.

Since the creation of the SONEDE in 1968, Tunisia has applied rates differentiated according to consumption use type. The current rates system for drinking water is graduated according to use and water consumption band. The differentiation by use allows for three categories: domestic, public, trade and industry; tourism (hotel industry); and standpipes. Thus, the 5 consumption bands each have their own rate. The tourism sector has the highest rate. This differentiated rate for hotels has made observation of the water consumption of the tourism sector today a lot easier. Tunisia has striven for many years to reconcile the economic growth of the tourism sector with management of a scarce resource.

However, a share of consumption remains beyond the scope of statistical observation due to autonomous, undeclared sources such as private wells, which are difficult to evaluate.

IV. Recommendations

As this study illustrates, the subject has very little statistical coverage, due to the newness of the approach and also due to the absence of organised collection and difficulties with methodologies and definitions. Specifically, these methodological difficulties do not allow us to systematically determine tourist activities, or their impacts on the environment and natural resources including water.

Apart from technical and organisational recommendations to cover this 'water and tourism' issue, in-depth analysis and discussion of the tourism sector itself is also desirable, to better define the scope of tourist activities (whether or not to include leisure activities), taking into account their impacts on the environment (golf courses, swimming pools, spas, etc.) and to tackle the question of the informal and non-market sector.

IV.1 TECHNICAL RECOMMENDATIONS

IV.1.1 Define the field of study

In order to produce statistics on 'water and tourism' interactions it will be necessary to define the field of study and, in particular, the scope of the tourist sector and its delimitation in the country. This discussion goes far beyond the context of a 'water and tourism' or even a 'tourism and environment' study. In particular, it poses the question of differentiation between tourism and leisure. On the one hand it is difficult to distinguish between international tourists, local residents and domestic tourists, and to clearly identify the many companies that have a combined tourism and leisure, or even a private tourism activity.

Tourist accommodation

As we have observed throughout the study, the initial approach involves concentrating on tourist accommodation, which is the main element of the holiday stay and can easily be distinguished both in national classifications and operationally.

The examples studied show however that this approach is often partial due to the treatment of types of accommodation and their administrative identification. This approach thus requires the existing classifications to be developed to take account of the different types of accommodation (graded and ungraded) and their potential impact on the environment. The categories generally identified include hotels (as a function of the number of stars), holiday villages, tourist residences, apartment/villa rentals, campsites and guesthouses.

For 'graded' establishments, company registers are the main source of identification. Registers must therefore be regularly updated to take account of the different types of accommodation and allow clear identification of the tourism activity involved. The development of registers and administrative declarations also makes it possible to identify these establishments' activities and facilities. This requires a coordinated information system to share and use the data (see below).

Where such information systems do not exist, ad hoc surveys can be carried out regularly (every five years) to identify hotel establishments' activities and facilities and to monitor environmental issues (water, waste, energy).

The informal and non-market sector

As we have already seen, the share of the informal and non-market sector can be significant in certain countries (tourists staying with family or friends, undeclared rental of apartments or villas, rural tourism involving bed and breakfast or other small-scale accommodation). Although the informal sector's share does not appear significant compared to total water consumption, this sector shares in the tourism sector's overall responsibility with regard to management of the resource. This dimension is still difficult to deal with.

Depending on the country, the share of informal tourism is not the same and the way of processing it can vary:

- In Tunisia, the tourist product is mostly hotel-based and the informal and non-market share of tourism is minor. It would appear useful to concentrate on hotels and similar establishments only (clubs, holiday villages) in order to obtain a relatively precise view of the impact of tourism.
- This also appears to be the case in Morocco, where rural tourism is still quite insignificant at national level. Formalisation of these other types of tourism can be envisaged in the longer term. On the other hand, the local impact of these developing forms of tourism on the water resource may be significant. Local action, including raising owner and tourist awareness and technical checks on installations, must be carried out by local authorities and/or the associations present on the ground.

Where non-market accommodation has a large share in tourism activity (as in Israel, for example), we can make two hypotheses:

- Either the use of this water by these tourists is treated as domestic use and is therefore not recorded for tourism;
- Or a study is carried out to evaluate the surplus consumption of a household accommodating tourists in the house and this ratio is allocated to the tourism statistics (see section on models).

Regular studies and use of models seem to be the right tools for monitoring this sector.

A wider view of tourism

Apart from accommodation, certain tourism activities and, more widely, leisure activities can have a significant impact on water resources through high levels of consumption. This is the case for golf courses, swimming pools and aquatic centres, well-being centres, etc.

It would be simplistic to omit these activities when tackling water and tourism. Currently, national classifications do not permit identification of these activities or their attachment to the tourism sector.

Should these activities be included in the tourism sector? A change of classifications in this direction appears difficult to achieve and, in any case, raises the much wider question of the place tourism has in national economies.

Initially, an inventory of establishments that offer these activities to tourists could be compiled on the basis of ad hoc studies or administrative declarations. This would indicate:

- the number of establishments concerned (if this is very high, a change of national classifications would be justified. If it is low, an observation system based on field surveys can be set up);
- the characteristics of their use of water resources (consumption, source of the water consumed, release of pollutants, types of use, etc.)
- the proportion of tourism-related traffic;
- whether it is appropriate to treat this sector as a tourist activity in its own right.

IV.1.2 Identify the variables/indicators to be developed, collected and disseminated

Monitoring of the 'tourism and environment' and more specifically the 'tourism and water' issue calls for new indicators to be defined.

The fields of investigation cover:

The characteristics of the tourism sector

- hotels and other types of accommodation: campsites, rentals, ungraded hotels, specific forms of rural accommodation, non-market accommodation (with family or friends, second homes);
- informal accommodation (bed and breakfast, rental of apartments, villas);
- identification of water-consuming tourist activities and facilities: swimming pools, golf courses, amusement parks, well-being centres;

The characteristics of the water sector

- water consumption of tourism establishments (monthly/seasonal);
- type of water resources used;
- identification of consumption points;
- volumes of water treated and re-used;
- identification of informal uses of water; inventory of private wells and of tapped volumes;
- identification of the measures taken by tourism establishments to save water (detection of leaks, investment in technical equipment (automatic or drop-by-drop watering system, recycling of swimming pool water, installation of water saving equipment, renovation and adaptation of the water system, etc.), organisational measures, raising of staff awareness and staff training, raising of customer awareness),
- total expenditure (current investment and expenditure) for better management of water/water saving policy;
- total subsidies paid and benefits granted for the purchase of water-saving equipment, autonomous purifying systems, etc.

We propose the following indicators:

- Average monthly consumption of water per bed-night and per type of accommodation;
- Distribution of hotels' water consumption points;
- Percentage loss in total consumption (hotels);
- Hotels' use of waste water as a percentage of total water consumption;
- Annual consumption per hectare for irrigation of a golf course;
- Annual consumption of a swimming pool, per m³ of swimming pool;
- Annual consumption of an aquatic park, per visitor;
- Percentage of tourist accommodations with a swimming pool;
- Percentage of tourist accommodations with a well-being centre (e.g. spas);

- Ratio of bed-nights in market accommodation/bed-nights in non-market accommodation
- Percentage of bed-nights in graded accommodation (for which information is available on water consumption);
- Surplus consumption of a household accommodating tourists (expressed as volume per day per visitor);
- Percentage of hotels that have adopted water saving policies.

Work on this subject has been done in France by the Institut français de l'environnement (*Ifen*): *Tourisme, environnement, territoires: les indicateurs Ifen, 2002*; and *Données essentielles — Nouveau sujet « Tourisme et environnement » Ifen, October 2008*).

IV.1.3 Collect data

On data collection, we offer the following recommendations to improve the statistical coverage:

Use existing sources of information

A more thorough use of existing information sources:

- Use of administrative records: customer declarations, commercial use authorisations, water monitoring and management, recording of taxes, etc.)
- Records of water supply companies: recording of the volumes of water supplied, follow-up data on supply management, etc.
- Academic sources (studies, definition of coefficients, etc.)

It is therefore necessary to improve the circulation of information and to develop information systems to permit regular, formalised collection of the information (see organisational recommendations).

Add questions to existing surveys

The existing surveys that could be expanded are the economic surveys of companies providing environmental services (water production and distribution, management of wastewater and waste), and surveys of tourism and hotel companies (with monthly or annual follow-ups). Data collected on hotels is often limited to the number of rooms and beds, to bed-nights and to the occupation rate.

Surveys could also ask questions on water consumption.

For the monthly hotel figures, the existing questionnaires are simple and quick and could easily add new questions on the use and consumption of water without becoming too time-consuming and being rejected by respondents. Annual surveys of hoteliers or authorities' wider surveys on environmental companies could have a more detailed environment module covering not just water but also other environmental issues such as consumption of energy, chemical products, waste management, etc.

Additional questions could cover: water consumption (annual and monthly), based on establishments' meters; leaks; re-use of waste water, complete information on water-consuming services and facilities present in the establishment (swimming pool, spa, restaurant, laundry, characteristics of air-conditioning towers, desalination units, etc.), the existence of water-saving measures implemented by hotels such as technical equipment, organisational measures, raising of staff awareness and staff training, raising of customer awareness.

Create specific questionnaires on subjects not covered

The drawing up of specific surveys remains a possibility, but this solution can be costly. Designing, holding and processing surveys are a significant undertaking for national statistics institutes and ministries. The persons we met on the fact-finding missions were quite non-committal about this possibility.

Holding certain ad hoc surveys could be justified, especially to cover the informal sector/non-market sector of tourist activity (particularly in Israel and Jordan, or for rural tourism in Morocco) and also the self-supply of water (informal water tapping/private wells).

Following on from the field study, Jordan and Jordan's Department of Statistics (DOS) decided to tackle this question more specifically and have started to develop a questionnaire for hotel establishments (see Annex C).

IV.1.4 Create Mediterranean benchmarks (hotels, golf courses, etc.)

A benchmark involves comparing an individual situation (an establishment, a country, etc.) to a set of situations (a group of establishments, the Mediterranean basin, Europe, etc.). Using a benchmark enables us, with the caution required for each individual situation, to evaluate progress margins and the impact of any measures applied on this progress.

At national level, Tunisia, for example, has developed a measurement of the average water consumption of hotels, which could constitute a national benchmark.

The study carried out by Israel has, on the other hand, evidenced the difficulty of defining this ratio, considering the variety of parameters to be taken into account in the particular situation of the Israeli tourism economy.

From a regional point of view, the Mediterranean basin, although made up of heterogeneous countries and regions, is nevertheless faced with common challenges linked to a scarce water resource threatened by climate changes and a tourism economy making increasing demands, which could justify an approach of this scale to water demand issues in the tourism sector.

However, the work carried out in this pilot study shows how difficult it is to develop benchmarks for the region, given the diversity of situations encountered and the still poor knowledge of national practices from a water consumption point of view.

Work on related values (the possible changes of a value in response to a given action) could also be worth exploring, particularly with regard to the rational use of water and the estimation of potential water savings.

At the European level, environmental reporting and hotel performance evaluation tools do exist: Tourbench (LIFE project, www.tourbench.net), ITP Benchmark Hotel (www.Benchmarkhotel.com), Green Globe 21 (Online Environmental Assessment of Buildings), Heat Online, etc. These tools could form a useful short-term work basis, to subsequently be fine-tuned to adapt to the Mediterranean context.

IV.1.5 Develop a model of the tourism sector's water demand on the basis of tourism statistics and consumption ratios

We have already seen that statistics on the subject of 'water and tourism' currently barely exist and that the development of statistical documentation is complex, costly and long-term.

The development of models on the water demand of tourism activities is another possibility. The model has the advantage that it does not require the obtaining of precise statistics on water consumption, but rather uses existing information (ratios, ad hoc study results, tourism statistics) to estimate a consumption model.

The development of models goes beyond the normal activities of statistics institutes, although they do use statistics; but they can be a useful short-term tool for use in decision-making, defining tourism policies and strategies, and assessing the impact of future tourism investment projects.

IV.2 INSTITUTIONAL RECOMMENDATIONS

The above analysis has evidenced the shortcomings in access to and circulation of information. Therefore, in addition to the technical recommendations, in order to develop statistics covering the 'water and tourism' issue we also need to work on institutional aspects and the information systems to be set up.

IV.2.1 Set up a national working group on the subject

Setting up a national working group on the subject of 'water and tourism' and more generally 'environment and tourism' would be a starting point. Countries that have started to take steps towards introducing water accounts have on occasion set up working groups or inter-institutional committees that can prove to be a useful basis for discussing and considering the tourism issue.

The objectives of such working groups are:

- to bring together players in the water sector and the tourism sector;
- to raise the awareness of tourism players on the water issue;
- to improve the institutional cooperation between water authorities and tourism authorities with a view to collecting existing information;
- to define a common work programme;
- to define follow-up indicators;
- to organise data collection (making use of existing surveys, developing new surveys, using registers, pilot studies, etc.);
- to discuss changes required by law: classification of hotels, criteria for granting subsidies, rules for the re-use of wastewater, differentiated rates for tourism establishments, etc.
- to make best use of the information and data collected to draw up sector policies that take into account management of water resources.

IV.2.2 Raise player awareness

The fact-finding missions have demonstrated the lack of awareness of the various players interviewed about the challenge that the 'water and tourism' relationship can represent. This lack of interest does not make it easier to access information and develop indicators on this subject.

Beyond the purely statistical aspect, the value of a more rational management of the resource and the water-saving opportunities deriving from this can prove useful tools for raising awareness.

Thus, we need to encourage the authorities in charge of tourism and local authorities to take the water issue into account when defining tourism policies and strategies.

Awareness must also be raised among water producers and suppliers on the need to develop more detailed monitoring and to provide swifter access to this data.

For tourism companies and operators, improved monitoring of water consumption levels represents significant economic savings. National moves in this direction already exist, in particular on potential water savings in hotels. However, these moves do not necessarily lead to a coordinated and centralised monitoring system.

IV.2.3 Developing information systems

Setting up information systems is the key to collecting and sharing data. Currently, information circulates in extremely heterogeneous forms, often on paper and with no precise procedures. This is a source of error and does not allow the information to be regularly updated or the figures to be directly put into use.

Information systems on water are under construction in some partner countries. With these systems in development, we must now ensure that the tourism dimension is taken into account when setting up the national information system.

Coordinating work must be done (via the national working group, but also via the existing departments responsible for the management of water demand) to seize the opportunity to implement these systems and introduce flows of information about tourism.

Conclusion

The study on 'water and tourism' raises wider questions about the recognition of tourism activities in national economies. Detailed statistical observation of the interactions between these activities and water consumption appears difficult to achieve in the short term.

In any case, although water resources are a central concern in the Mediterranean zone, water is still only one component among the many other environmental impacts of tourism activities (energy consumption, consumption of space, artificialisation of landscapes, production of waste, noise pollution, etc.).

It would be simplistic to deal with only one aspect of this interaction. If efforts are made to develop classifications, create or modify surveys, mobilise efforts and financing, the upstream discussion must cover all environmental aspects, even if the operational implementation focuses only on the water question, because it is the most worrying.

Furthermore, although tourism is a priority sector in many Mediterranean countries, it has a very small impact compared to agriculture and industry. It is not an environmental control priority in the countries in question.

Finally, we need to evaluate the cost/benefit of an in-depth study on the statistical observation of the 'water and tourism' issue. The priorities appear to be:

- to raise awareness among the sector's economic and institutional players;
- to draw up environmental impact studies for significant tourism investment projects (resorts, hotel complexes, etc.);
- local control of small projects (local impact study, raising population's awareness);
- the gradual introduction of environmental criteria into the regular and spot surveys carried out on the tourism industry.

ANNEXES

A. ABBREVIATIONS AND SYMBOLS

DOS: Department of Statistics, Jordan

PCBS: Palestinian Central Bureau of Statistics

HCP: Haut Commissariat au Plan, Morocco

WTO: World Tourism Organisation

ONEP: Office National de l'Eau Potable, Morocco

SONEDE: Société Nationale d'Exploitation et de Distribution de l'Eau, Tunisia

Mm³: million m³

JD: Jordanian Dinars

: Data not available

B. STATISTICS COLLECTED

This appendix lists the data we were able to identify on the missions to the 4 participating countries.

Israel

Electronic versions:

Statistics on tourism on the website of the Central Bureau of Statistics: www.cbs.gov.il
(http://www.cbs.gov.il/reader/?MIval=cw_usr_view_SHTML&ID=432)

Tourism Account on the website of the Central Bureau of Statistics:
http://www.cbs.gov.il/www/publications/tourism_account01/tourism_account_e.htm

Statistics on water production and consumption on the website of the Central Bureau of Statistics:
www.cbs.gov.il (http://www.cbs.gov.il/reader/?MIval=cw_usr_view_SHTML&ID=500)

Report of the Water Authority on water conservation in hotels

Paper versions:

Leaflets: Tourism in Israel 2006; Hotels in Israel 2006

Statistical report Tourism to Israel 2006, Central Bureau of Statistics

Questionnaires for Guests and bed-nights survey, Revenue and employees survey for hotels,
Central Bureau of Statistics

Water account structure, Central Bureau of Statistics

Israel in figures 2007, Central Bureau of Statistics

Presentation 'Israeli Experience in Water Sector Saving in the Municipal Sector', Water Authority

Jordan

Electronic versions:

MoTA statistics for 2006 (Excel)

Results of the Arrival-departure Survey 2006-07 (Excel)

DOS statistics on www.dos.gov.jo

Work documents about Green-TAS project: www.just.edu.jo/green_tas

Paper versions:

Promotion documents from Visit Jordan

Leaflet about Green-TAS project (in Arabic)

List of all tourist establishment members of JHA (Jordan Hotels Association) with contact details

CD-Rom available

Jordan's Water Sector (Ministry of Water and Irrigation)

Morocco

Electronic versions:

Annuaire Statistique du Maroc 2006, avec une mise à jour 2007 sur le secteur du Tourisme — Haut Commissariat au Plan, Direction de la Statistique

Paper versions:

Le Maroc en Chiffres 2006 — Haut Commissariat au Plan, Direction de la Statistique

Statistiques d'exploitation de l'eau potable 2005 — ONEP, Direction Planification et Stratégie

Formulaire d'enquête de structure sur les services, exercice 2006 — Haut Commissariat au Plan, Direction de la Statistique

Formulaire d'enquête annuelle des entreprises dans les services, exercice 2005 — Haut Commissariat au Plan, Direction de la Statistique

Compte satellite du tourisme (années 1998, 2001, 2003) — Haut Commissariat au Plan

Tunisia

Rapport statistique annuel, SONEDE;

Consommation annuelle par type (dont tourisme) (million m³)

Volume consommé par lit occupé (litre / jour / lit)

Volume consommé par lit disponible (litre / jour / lit)

Consommation par zone touristique selon la définition de l'ONTT (Consommation semestrielle par type (dont tourisme) et par niveau géographique)

C. EXAMPLE OF SPECIFIC QUESTIONNAIRE PROPOSED BY JORDAN



**Serial Economical Surveys
ENVIRONMENTAL SURVEY
FOR HOTELS 2007**

First: Identification Informations for the Hotel		
1-	Sector	
2-	Isic	
3-	Category	
4-	Serial No.	
5-	Governorate	
6-	Region	
7-	Hotel Name:.....	
8-	Address:..... P.O.Box:(), Tel:(), Fax: ()	

Secondary: General Informations			
1-	Hotel Class(*)	(.....) Star	
2-	No. of Visitors and Habitants(**)	
3-	No. of Rooms at the Hotel(***)		
4-	There are the Following Services:		
	4.1-	Swimming Pools
	4.2-	Sport and Massage Rooms
	4.3-	Restaurant
	4.4-	Physical Medication Rooms
	4.5-	Rooms for Special Occasions and Meetings

(*)	From (1-5)
(**)	Not Include the Visitors just the habitant at least for one night and by knowing the No. of the participants in the sports room and swimming pools and No. of the occasions and meetings happened in the year from the register book in the hotel.
(***)	Most Habitants fill the shower pool in the room for take shower so we suppose that shower daily and by know the size of the pool.

3rd - Water

301	302		303	304	305
Serial No.	Water Source	xx	Water Value (JD)	Water Quantity (M ³)	Sewage Water (M ³)
1-	Public Network				
2-	Tank				
3-	Well				
4-	Distilled Water				
5-	Other				
Total					

306- Quantity of Used Water by Type of Use

Quantity of Used water	Type of Use Water					
	1	2	3	4	5	6
.....	Kitchen	Drinking	Swimming Pool	Rooms	Irrigation	Other

307- Treatment of Sewage Water

Total of Sewage water	1	2	3
	Total Treatment	Partial Treatment	Not Treatment
.....

308- Disposing of Sewage Water

Total Sewage Water	Methods of Disposing Sewage Water						
	1				2	3	4
	Recycle				Sewage Network	Cesspool	Other
.....	1	2	3	4
	Swimming Pool	Sell	Irrigation	Other			

4th - The Power

401	402		403		404	405
Serial No.	Type		Unit		Value (JD)	Quantity
		xx		xx		
1	Electricity		KW			
2	Diesel		Liter			
3	Fuel		Ton			
4	Gas		No.			
5	Gasoline		Liter			
6	Super Gasoline		Liter			
7	Kerosine		Liter			
8	Coal		Ton			
9	Other					

5th - The Solid Waste Produced by Hotel During 2007:

501	502		503	504					
Waste Type	Unit	xx	Quantity	Method of Disposing of Wastes					
				% from the total Quantity					
				Municipality Dump	Recycle	Store	Dipping	Burning	Sell
Food Residues									
Glass									
Plastics									
Paper									
Metallic									
Mattress									
Leather									
Sponge									
Fabrics									
Perfume & Detergent & pesticide cans									
Plastic Bag for Waste (Large size)									
Agricultural Waste									

European Commission

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