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WATER THINK TANK

IN A FEW WORDS

The Water Think Tank Méditerranée (WTM) initiative was launched by the Prince Albert II of Monaco Foundation during the 5th World Water Forum in Istanbul in March 2009, in partnership with the United Nations Institute for Training and Research (UNITAR), the Plan Bleu, the International Office for Water and Veolia Environnement. This initiative follows on from a round table organized by the Prince Albert II of Monaco Foundation, UNITAR and Veolia Environnement, during the Zaragoza Water Expo in 2008, on the theme of integrated water resource management and the role of local authorities.

Urban development lies at the root of many challenges concerning water management throughout the countries of the Mediterranean region. Each local environment is distinguished by specific constraints, often accentuated by the effects of climate change: shortage, deterioration of the quality of natural resources, the state of access networks to water and sanitation services, conflicts of use... These complex problems require clear choices to ensure the sustainable development of the Mediterranean region. Such issues also affect the implementation of solidarity mechanisms in various forms and at various levels.

The Water Think Tank Méditerranée fosters dialogue in order to promote sustainable and integrated water resource management within the Mediterranean region. In order to carry out this task successfully, the WTM endeavours to take on board the views of all the public and private stakeholders involved in water management and implements tools for exchange and cooperation thanks to the production, capitalisation and sharing of knowledge.

Several initiatives concerning the water sector exist in the Mediterranean area, bringing into play mechanisms for political, financial, scientific and technical cooperation. The main aim of the Water Think Tank Méditerranée is to identify and promote governance mechanisms that will contribute towards efficient coordination between the various levels of management, especially that of the catchment areas and local authorities. This involves examining the conditions required to ensure the sustainability of drinking water and sanitation services in Mediterranean cities, based on concrete case studies to ensure equitable water access.

The project is based on a Research/Action process for the local players involved in territorial water governance. The research carried out by the Water Think Tank Méditerranée has led to the definition of the various types of conflict of use and an analysis of the solutions observed as far as water sharing is concerned. Following this work, the founding partners of the Water Think Tank Méditerranée organized a symposium to present and discuss the results of their research with all the stakeholders involved.

The main approaches of the Water Think Tank Méditerranée are included in this synthesis. The Water Think Tank Méditerranée is currently exploring more deeply the issue related to conflicts of use and water regulation at the Mediterranean metropolis scale.
Our civilisation was born on the shores of the Mediterranean. Against the backdrop of its steep mountains, arid landscapes and clear waters, philosophy and politics were invented and trade was developed several millennia ago. On these same shores today, however, there are growing signs of a terrible decline. Not of our civilisation, which still has many wonderful projects to offer the world, but of a system based on the senseless exploitation of nature and short-sighted management of its resources.

Water is perhaps the most vital of these resources. But as well as representing great potential for today’s citizens, it also symbolises great need. Around the Mediterranean in particular, the difficulties associated with its use are numerous, from the conflicts over the use of shared resources and the insufficiencies of water treatment systems to the problems of water supply and sanitation.

Which is why in 2009 I decided to launch, with UNITAR, Plan Bleu, the International Office for Water, Veolia Environnement and my Foundation, a frank and practical dialogue on the topic involving scientists, technicians and political leaders and strengthening cooperation between the disparate regions of the Mediterranean Basin.

By basing its work on a precise diagnosis of water-related problems, listening to local stakeholders and examining the reality of water use, this Water Think Tank has enabled us to make progress in understanding water governance as well as the geographical, technical, political, historical and symbolic factors associated with it.

In so doing, we have tackled the issue from every angle: locally, at catchment basin, stream and well level, and from a wider, regional and even continental perspective.

Without this understanding of the reality on the ground, appropriate progress in water resources management would not be possible. Similarly, unless we take a systemic view of a region as diverse as the Mediterranean, permanent solutions will elude us. There is a need for efficiency, but much more besides. There is a need for the two sides of the environmental battle to be united, so that it is no longer people versus the planet.

After three years’ work, I believe that this method has proved its effectiveness. I now hope to see its conclusions become a reality for those who must be the first to benefit: the populations living around the Mediterranean for whom in the 21st century water remains a crucial problem.
WATER MUST PAY FOR ITSELF!

The Mediterranean civilisation revolves around water and the sea. The most significant disputes in its history have often been over the use of fresh water, which has always been a scarce resource in this part of the world and is more so than ever today. Fresh water is likely to be scarcer still in the future because of the four major threats our planet faces: pressure from population increase, growing urbanisation, the impacts of global warming, and diminishing resources. Complicating matters further are the long-standing issue of poorly distributed water resources, and urban and industrial pollution.

However, solutions do exist. In the first place, there is healthy international awareness. The 1995 Barcelona Declaration, which demonstrated the political will for cooperation between Europe and the Maghreb, provided a framework within which institutions were subsequently set up combining expertise and political initiatives from both sides of the Mediterranean. But much remains to be done. Two approaches must take priority if solutions are to be found. The first is to improve water governance so that institutional processes based on proven methods of consultation, planning, centralisation and monitoring can be implemented. Managing the resource at hydrological basin level, which involves all local and regional stakeholders, is an example that has proved its value, particularly in France.

Secondly, once the countries have stronger permanent institutions in place, the following essential principle must be adhered to: water has to pay for itself. After all, wasted water is money down the drain! Technology will play a vital role in achieving this. Irrigation, which currently consumes 70% of the resource, could be more efficient. Better quality water distribution systems minimise leakage just as good industrial process design further reduces consumption. Wastewater and rainwater reuse, and the use of knowledge support tools and new information and communications technologies are other solutions that can help fulfil this principle. Research, as a matter of priority, must focus on improving the water–energy nexus, which will make the high production costs of desalination plants more bearable in the future. Finally, the pressing need to develop water industry training is a major challenge that remains to be addressed, to give network planners and managers, as well as operatives on the ground, the tools to implement all these solutions.

But how is all this to be paid for? The financial challenge is huge. Institutions do exist to meet requirements, but there has to be integrity and trust between all partners if the funds are to be used effectively. National development grants can only be awarded if the region in question has proven political and social stability and honours its commitments. Similarly, international financial institutions must forge reliable partnerships if they are to make coherent proposals. Decentralised cooperation between stakeholders, local government, local authorities and NGOs also opens up financing prospects which, although modest, offer a wealth of vital experience sharing opportunities. And last but not least, we can appeal to public generosity. When properly supervised, it can be a means of financing local projects that meet needs very closely. We have a duty to act efficiently and in the spirit of community.

Jacques Oudin
Honorary Senator for the Vendée
and Honorary Senior Councillor at the Court of Audit
Understanding
WATER, PEOPLE AND LAND

In the countries of the Mediterranean Basin, fresh water is as vital as it is scarce. In some areas this has always been the case. But with rapid population growth and the already apparent effects of climate change, the situation is becoming more complex throughout the Basin. Groundwater reserves are rapidly diminishing. This combination of galloping urbanisation and climatic uncertainty bringing both unprecedented droughts and sudden flooding is fuelling local conflicts over water use that could become more widespread in the future. There is an urgent need to defuse tensions and try to resolve the conflicts that have broken out.

This first section examines the historical roots of the conflicts in each country, and how they differ depending on whether they are in the eastern, northern or southern Mediterranean. Questioning the very nature of water conflicts can ease tensions through dialogue and drive the consultation process in a positive direction. A major government-run river harnessing project underway...

WATER IS ALSO A NATURAL ENVIRONMENT

Wetlands with their meandering, gently flowing watercourses are not merely places where unlimited amounts of the resource can be drawn for specific uses. They are also a living environment that must be protected from the ever increasing pressures from agriculture, industry and urban areas. When protected, these areas provide the community with numerous essential services: they protect against flooding, naturally purify wastewater and help preserve biodiversity – an array of unaccounted services guaranteeing the sustainability and preservation of the resource.

“Interestingly, the words ‘river’ and ‘rivalry’ share the same etymology”

HOCINE BENDJOUDI
Paris University VI (France)

The Mitidja plain near Algiers, originally marshland, was cleaned up and developed, notably after the Moors fled Spain following the fall of Granada in 1492. It became a rich farming region (citrus fruits, roses, cereals, vines) thanks to large-scale water management schemes (Hamiz and Bouroumi dams and irrigation zones). But its ability to continue functioning efficiently as farmland is seriously threatened by fierce competition for land and water resources due to the development of urban areas (both planned and uncontrolled) and industry and transport infrastructures (motorways, airport) – with natural areas dwindling as a result.

“We shouldn't be thinking anymore in terms of priorities in allocating water resources but rather in terms of compatibility and complementarity in their use”
in Anatolia (Turkey), designed to boost the economic development of the region, is stirring up a long-standing mix of local stakeholders; analysing the situation from a sociological point of view is proving to be helpful. Dwindling wetlands close to main arterial routes bringing industrial development and property projects are also potential sources of conflict. These large natural areas must be preserved so they ultimately produce wealth of a kind not always universally recognised because it is difficult to quantify in national economic indices.

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**EFFECTIVE MEDIATION:**
**THE PLAIN OF VALENCIA WATER TRIBUNAL (SPAIN)**

A thousand-year-old institution can serve as a model of people’s wisdom. A voluntary group of farmers, elected to represent various irrigated communities of the Valencia plains, pass judgment on their peers when they fail to abide by the established rulings. Those who monopolise the resource for their own benefit alone are fined. There is no appeal system because the fines are perceived as fair. And this system has been in place for a thousand years! This unusual tribunal sits once a week, always in the open air, outside Valencia cathedral. The elected body of eight judges has jurisdiction over the eight irrigation channels that water the Valencia plains. This system of arbitration is a fine balance between tradition, adaptation to the realities of the modern world and climate change.

“Spain is a European country with an African climate”

**RAMIRO MARTINEZ**
Mediterranean Network of Basin Organisations

It is important to define the concept of the catchment basin, to distinguish between ‘Mediterranean Basin’ and ‘Euro-Mediterranean Basin’. These regions do not follow the natural water cycle. And from a regulatory point of view, something that also sets them apart is the EU Water Framework Directive. It is applied equally to all 27 Member States, but does not take into account the disparities in availability of the resource depending on the latitudes at which the countries are located. There is no comparison between the plains of Alsace and those of Andalusia or southern Italy, and they make enlightening examples. A country may be governed by European law but its climate much less so! The Mediterranean Network of Basin Organisations (MENBO), which is part of the International Network INBO, promotes integrated water resources management at the same level where the natural hydrological cycle develops – namely at basin level – and in a region with similar hydro-climatic characteristics.
“Rivers are key to the sustainable development of a region”

THE CONSTRUCTIVE POTENTIAL OF CONFLICT

Water is too vital a resource to deprive others of it. It is a question of survival – and shared common sense. Without being blindly optimistic, it is important to acknowledge that ‘water wars’, although often predicted, have rarely taken place throughout history. This does not mean that conflicts do not exist – quite the opposite! One explanation for the infrequency of war is the fact that conflict has a certain constructive potential. The potential that instead of leading to a physical confrontation between the parties paves the way for dialogue by obliging the people involved to enter into a negotiation process.

BRIGITTE FOUILLAND
Paris Institute of Political Studies (France)

Conflict over water resource use is an expression of deep-seated disagreement. It is different to the notion of dispute, which more often than not can be resolved through negotiations between a handful of people. A conflict caused by one or other party suffering damage is another matter entirely, on a much bigger scale, so to speak. The scale of a conflict goes beyond the familiar, localised territory of a dispute to become regional in scale, expressing cultural differences in which the sense of inequality is heightened. More than a straightforward case of rivalry between local stakeholders involving a temporary disruption in the right to use the resource, conflict builds up over a longer period of time and sometimes crosses administrative borders. It is a historical process in which the stakeholders bring different mental perceptions and justifications to the table.

KEY FIGURES

21 countries bordering the Mediterranean

143 million coastal inhabitants

3 climate types

46 000 km of coastline, of which 41% on islands

75% prediction of the population in the Mediterranean region living in cities in 2011

156 million hectares of dry and arid land in the Mediterranean
Local communities in areas where water is scarce have always developed a collective awareness of the issues at stake, cooperating with one another and adapting to fluctuations in availability. Conversely, communities that have never been confronted with scarcity do not have the same awareness. A change in a region’s water balance, due to changes in resource use, the arrival of new stakeholders or the setting up of new management structures can destroy the balance established at local level. One fundamental question needs to be asked: to what extent must existing local institutions be taken into account when setting up a new system of organisation decided on by the authorities at the highest level of government?

How would you define a conflict of use?
Conflict is part of human nature. Learning to negotiate is part of our education as humans. Interestingly, the word ‘rivalry’ comes from the Latin rivalis, meaning someone who uses the same stream as another, and therefore has to compete with them over the use of the resource.

Can you give us an example of rivalry in relation to sharing water?
Conflict over the use of water resources is often hidden. For example, in my country, Turkey, the State has privatised almost two thousand hydroelectric power stations, each of which has a generating capacity of five to ten megawatts. This led to a great deal of opposition from NGOs about the environmental impact of such projects, despite reassurance from engineers. But when I read a paper on small hydro plants developments in Turkey, I was surprised; I realised that it was not so much the local communities living near the dams and from the areas flooded to make reservoirs that were opposed to it, but mainly the people who had been forced to leave their region at a young age to go and work in the city. Their emotional attachment to the place where they no longer lived but which they hoped to return to one day was a more significant cause of opposition to these radical changes in the landscape.

What conclusion do you draw from this?
That it is basically difficult to decide who is right. It is a complex problem and everyone involved is right! Appreciating these differences in the way the land is perceived by those who live there permanently and those who have left, for whom the situation is highly-charged emotionally, is an interesting approach towards understanding why conflicts arise. Seeking dialogue and trying to reconcile the opposing sides by calling in a mediator – in this case the author of this sociological study – can be a helpful exercise.

“In conflicts over the use of water resources, everyone involved can be right!”

AHMET METE SAATÇI
Department of Environmental Engineering, University of Marmara (Turkey)
**Water conflict**

According to its common meaning, conflict refers to open opposition between parties, usually involving violence. It is in this context that international water conflicts are most often analysed. It is, however, appropriate to acknowledge that conflict is also potentially constructive: not all conflicts are open, in other words it does not necessarily lead to a physical confrontation between the parties. Very often, it can pave the way for dialogue by obliging the people involved to enter into a negotiation process. In the Mediterranean Basin, conflicts over water use only rarely reach a state of open conflict. They are generally concentrated at local level and should be approached as a repeated, dynamic process closely linked to socio-economic, cultural and regional factors.

**Public good**

Public goods are goods that are non-rivalrous and non-excludable, not only between individuals but also between the populations of different countries. Water is a special case because its non-rivalry is questionable. It should therefore be considered rather an ‘impure’ public good, which means that its consumption by certain parties can have an effect on its quality and on the quantity available to other parties.

**Urbanisation rate**

This is the percentage of the population living in urban areas. The boundaries of a country’s urban areas are generally defined as part of a census and are normally based on the size of localities, the classification of areas into administrative centres or according to specific criteria such as population density or the type of economic activity residents are engaged in. The variations in national definitions make it difficult to draw international comparisons, although it is possible to compare rates for different time periods within the same country. This indicator shows the concentration of populations in cities. Indirectly, it describes lifestyles, the balance of populations in a given region and the attractiveness of cities.

**Mediterranean climate**

The Mediterranean climate is temperate (either ‘warm temperate’ or ‘subtropical’) characterised by warm, dry summers and mild, damp winters. Despite shared characteristics, several variants exist within this region.

**Water erosion**

A complex set of interdependent processes whereby the action of water causes soil particles to become detached and deposited elsewhere.

**Water stress**

A shortage of water of satisfactory quality to meet the needs of populations and the environment. Water stress involves a depletion of freshwater resources in terms of quantity (overuse of groundwater, dried up rivers, etc.) and quality (eutrophication, organic pollution, saline intrusion, etc.). Although there are already many populations living in regions subject to water stress, it is predicted that 2.8 billion people will be affected by 2025.

**Urban density**

The number of people living in a defined urbanised area. Urban density, like population, varies according to two criteria: densification (caused by more areas being defined as urbanised since the previous census) and expansion (resulting from the additional population in communities that change their status from rural to urban).
**GOOD GOVERNANCE**

Water governance, which comes within the sphere of public policymaking, is an attempt at organizing by involving stakeholders in the decision-making process. It cannot be defined without first understanding that it combines a wide variety of factors, not just human but also related to sophisticated abstract structures to do with the law of the land and often local customs too. Geographically, water governance has a nested structure, like a Russian doll. It is never fixed but is constantly adapting to new realities and challenges.

In the Mediterranean, the feeling that science and technology are advancing more quickly than our methods of governance is problematic. The integrated management of the resource as a means of establishing a cohesive view of its use is not yet widely implemented. Not everyone thinks in terms of quality as well as quantity yet. Economic planning at local and regional level and setting priorities for different uses of the resource are two challenges that have yet to be addressed.

**THE ESSENTIAL ROLE OF LOCAL STAKEHOLDERS**

In the Sohag Governorate in Egypt, the irrigation system had for a long time been founded on close cooperation within a farming community which managed the water collectively, both an irrigation channel (mesqa) and shared pumps (sakias). The arrival of motorised pumps, triggering the development of individual irrigation, broke this ‘hydro-social’ connection that had built up over time, making it difficult for the authorities to keep track of the amount of water individuals were using. With no controls in place, the water table dropped to dangerously low levels, which in turn made the whole irrigation system less efficient. This situation led the Egyptian government to draw up nationwide integrated management schemes designed to give power back to local stakeholders, the only ones able to verify on the ground that the resource is being fairly distributed.

“We now have models that enable us to measure deficiencies in governance”

**AZIZA AKHMOUTH**  
Organisation for Economic-Cooperation and Development

The OECD’s ‘Multi-level Governance’ model identifies seven governance deficiencies, or ‘gaps’, related to the inherent fragmentation of water policies. This ‘pragmatic’ diagnostic tool includes a number of indicators that identify gaps in terms of policy, information, capacity, accountability, financing, administration and objectives. In the latter case, the lack of similar objectives among multiple actors and of a political leadership capable of negotiating can cancel out potential actions – like in the United States, for example, where the Clean Water Act and the Clean Air Act have sometimes stalled in the sub-national implementation phase due to diametrically opposed objectives.
The concept of basin management in the Mediterranean, where rights and responsibilities need to be balanced, must be better understood. Local stakeholders remain essential in building sustainable and responsible governance. Management of the end of the artificial water cycle for example – the local wastewater recycling loop – must be entrusted to these local players as they can manage scarcity efficiently.

In this sense, the EU Water Framework Directive can be seen as a hotbed of ideas. By paying careful attention to its implementation in Europe, it can help to improve water governance in the Mediterranean Basin. But of course the articles that work for northern Europe do not necessarily work for Southern Europe. The same goes for the Mediterranean, between the Northern, Southern and Eastern shores. Why is this? Quite simply because water is an unevenly distributed resource and rainfall varies widely from one part of the region to another. And finally, the balance of rural and urban zones is not the same on the European Coast as it is on the shores of North Africa.

A LOCAL CONFLICT INVOLVING A COMPLEX MIX OF STAKEHOLDERS

A private company providing water services in the town of Alcúdia in Spain proposed to bore down into the water table. The proposal was immediately opposed by local environmentalists and farmers on the surrounding plain. The local residents formed a ‘civil platform’ to defend their interests. In the end the authorities decided to protect the water source by listing it as a ‘National Monument’.

“If people consider the decision-making process appropriate, they are much more likely to find the decision acceptable”

RAFIQ HUSSEINI
Union for the Mediterranean

A number of different models of governance exist in the Mediterranean – authoritarian, autocratic and democratic – each with its own set of problems. But being presented with water resource management decisions as faits accomplis is not enough – we need to know how these decisions are reached, by whom, why and according to which rules. When people are better informed, they are more likely to accept the decision, even if it later turns out not to have been the best one! Transparency in the decision-making process is needed; it remains the most reliable tool in preventing corruption.
EXAMPLE OF A COHESIVE APPROACH: THE TOULON BAY CONTRACT

The large volumes of stormwater runoff due to changing weather patterns on the French Riviera, which are also extremely polluted as a result of the increasing urbanisation of the coastal area (soil progressively becoming impervious, modification of watercourses) led the operators and authorities responsible to develop an integrated system of coastal wastewater management. This methodical tool, designed to increase the efficiency of governance mechanisms, models all the parameters involved (soil, sea, weather, operator interface, micropollutant levels), forming the basis for a master plan underpinning a proactive management scheme. Inherently adaptable, it can be used to draw up a “bay contract”, as was the case in Toulon, where there has since been a marked improvement in water quality off the beaches.

ANTONIO TROYA
International Union for the Conservation of Nature

From now on, governance must be guided by integrated water resources management and adopt an ecosystemic view, which is the only one that understands the many services water provides, cheaply, to riparian communities. Focusing as was too often the case in the past on the sole problem of flow rate, for example to satisfy agricultural needs exclusively, is a truncated view of reality. Awareness of the complexity of the natural water cycle – surface water, groundwater, fluvial and coastal water – within a geographical unit (the basin), guarantees sound administrative and regulatory control of the territory. This is a real factor in the appeasement of conflict.

“Governance must take into account the complete water cycle”

KEY FIGURES

750 yachting marinas

69 rivers flow into the Mediterranean

40% of water resources consumed by 7% of the world population

3% of the world’s fisheries

1/4 The water available per head of the Egyptian population is 1/4 of what it was 50 years ago

2006 Spring 2006: ACWUA (Arab Countries Water Utilities Association) established

1997 1st World Water Forum held in Marrakech

“We often know what is fair, but we sometimes lack the courage to put it into practice”
How would you say that conflict over water resource use and governance are linked?
The scarcity of water and the need to share it in a just way are the two main causes of conflict. It is therefore a requirement of good governance, whatever form it takes, to be able to anticipate and prevent conflict, while at the same time be ready to tackle it if necessary.

What realities are encompassed by the term ‘governance’?
The situations in which we all live represent different governance realities. The spaces where we act—whether local, subregional, regional, national or international—all coexist and overlap. Without eventually being aware of it, we participate as individuals and societies in these multiple and frequently incompatible realities. It is often difficult to fully grasp the notion of sustainable governance because we lack a coherent view and ability to reconcile all these realities.

But in what sense can it be called ‘sustainable’?
I would explain it like this: imagine a tetrahedron whose base is governance and ‘sustainability’ is determined by the three facets on top: society, environment and economy. Placing each problem to the right point within the tetrahedron in order to ensure the appropriate differentiated proportion of contribution from each facet according to the realities on the ground ensures the sustainability of governance.

What does ‘good governance’ mean?
We can define it as combining three different categories (another geometric model, if you like, interlocking with the previous one). The new three facets are: first, the institutions, regulations and control mechanisms; next, technology and science, which increase the carrying capacity of the system; and finally, education and training, both formal and informal. Good governance means to always find the right combination of the three in order to address current or emerging problems.

Three problems exist in relation to the profile, distribution and effective power of the various stakeholders involved in governance. First, the voluntary involvement of citizens requires time and skills. Not everyone can participate, especially the poorest, which can lead to a bias of representation. Next, as a result of that observation but relating to power sharing, consulting the stakeholders does not necessarily guarantee a fair result because personal interest generally takes precedence over the common good. Lastly, participation can be harnessed for political ends. It is not sufficient for the authorities to consult all water resource users democratically if sharing the benefits is not taken into account in the final decision.

“Having the ultimate respect for governance while bearing in mind that through it we must address in a balanced way specific issues is one of the fundamental principles of sustainable development”

MICHAEL SCOULOS
MIO-ECSDE and GWP-Med

debate

CAN PARTICIPATION AND POWER SHARING GUARANTEE GOOD GOVERNANCE?

Three problems exist in relation to the profile, distribution and effective power of the various stakeholders involved in governance. First, the voluntary involvement of citizens requires time and skills. Not everyone can participate, especially the poorest, which can lead to a bias of representation. Next, as a result of that observation but relating to power sharing, consulting the stakeholders does not necessarily guarantee a fair result because personal interest generally takes precedence over the common good. Lastly, participation can be harnessed for political ends. It is not sufficient for the authorities to consult all water resource users democratically if sharing the benefits is not taken into account in the final decision.
Governance

Governance is the act of governing involving multiple stakeholders. In a more general sense it encompasses all the measures, regulations and decision-making, informative and supervisory bodies required to run and control a region or country efficiently. Decisions are arrived at through a process of consultation.

Framing

Framing is the subjective process of including or excluding certain aspects of a problem according to the priorities and values of the players concerned.

Citizen participation

Citizen participation implies that all parties affected by a political decision can be involved in the decision-making process. Arnstein (1969) describes eight levels of citizen participation, broadly categorised as: non-participation, tokenism (a symbolic act that has no impact on implementation) and citizen power.

Hydrographic basin

An area that captures precipitation and surface/groundwater runoff and channels it into a watercourse. Hydrographic basins are separated by a line called a watershed.

Integrated Water Resources Management (IWRM)

A process that promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (Global Water Partnership, 2000).

Territorial intelligence

An emerging concept that aims to integrate the spatial dimension into the study of human phenomena using a range of disciplinary approaches. It refers to all knowledge that improves understanding of territorial structure and dynamics. It uses territorial information technologies for the benefit of communities to govern the equitable and sustainable development of their regions in accordance with the governance principles of participation, partnership and global approach.

Bay/river contracts

A bay-level environmental action programme intended to support the collective management of water and the natural aquatic environment.

Subsidiarity

The principle of subsidiarity holds that responsibility for an action should always be given to the nearest entity, capable of handling it effectively. This principle defines the appropriate level of public-sector action.
Innovating
During the 1950s and 60s, some 20 million people were drawing water directly from the Nile. Since then, despite rapid population growth (81 million inhabitants) and a rise in people living below the poverty line, water scarcity has been avoided. Drinking water treatment plants set up all along the Nile, sometimes with desalination technology, have solved both the problem of social dignity and that of economic efficiency. These facilities have also helped curb pollution, with an average flow of 20,000 to 30,000 cubic metres of drinking water delivered each day. Ending the transportation of water over distances of more than 200 kilometres, as was done in the past, has also led to energy savings.

Numerous Technological Solutions Exist

Technological solutions exist to identify, capture, transport, store, treat, distribute, purify and reuse water whenever possible. These solutions can be implemented at any point in the water cycle, from drawing the resource upstream to reusing industrial wastewater and rainwater downstream. They can even have an impact on the natural water cycle, for example when water is fed back into the water table under certain conditions to reduce pressure on the resource and so redress the balance of supply and demand. These solutions are also intended to make the entire system more efficient, by minimising loss and avoiding waste.

A wide range of technical tools are available. Databases and geographic information systems (knowledge support tools) help us determine the status of the resource in a given region (location, measurement, usage rate) and also fulfil various monitoring, diagnostic and decision-support functions. Knowledge support tools are increasingly used in participative processes that

Triple Reuse of Wastewater, The Unique Example of the Baix Llobregat

The city of Barcelona and the 33 surrounding districts boast a vast wastewater management system. The system comprises a 250-kilometre drainage network, 29 pumping stations, 7 treatment stations and an 8-kilometre-long sludge discharge pipe. Nonetheless, its real strength lies in the multipurpose reprocessing of the water it recycles. Three levels of water quality come out of the filters, each destined for a different use. Level 1 goes towards maintaining stream flows, recharging aquifers, maintaining wetlands, sprinkling roads and cleaning sewers. Water from a finer filtration, called level 2, is assigned to irrigation in compliance with the standards in force. Lastly, after ultra-filtration and reverse osmosis, quality 3 water is used to stem the progressive intrusion of brackish water into coastal aquifers.

Nadia Abdou
Alexandria Water Company (Egypt)

During the 1950s and 60s, some 20 million people were drawing water directly from the Nile. Since then, despite rapid population growth (81 million inhabitants) and a rise in people living below the poverty line, water scarcity has been avoided. Drinking water treatment plants set up all along the Nile, sometimes with desalination technology, have solved both the problem of social dignity and that of economic efficiency. These facilities have also helped curb pollution, with an average flow of 20,000 to 30,000 cubic metres of drinking water delivered each day. Ending the transportation of water over distances of more than 200 kilometres, as was done in the past, has also led to energy savings.
include all the stakeholders who share the resource. Technology can also be harnessed to handle scarcity: deep drilling to reach freshwater pockets, desalination of brackish water and seawater as well as efficient wastewater treatment are real alternatives. Building dams to provide water for multiple purposes also enables resources to be transferred from one basin to another in some cases, fostering solidarity between regions.

But the success of a technological solution relies above all on the local realities being taken into account. In other words, a formula that works for one area cannot simply be replicated and applied to another. The various institutions concerned must share the same commitment and apply the same integrated resource management principles from a political as well as a technical point of view. If this happens, the system can work. Conversely, if there are glaring disparities between the institutions involved, faithfully duplicating a model could not only prove to be ineffective but could also give rise to conflict.

TUNISIA: OBTAINING DRINKING WATER THROUGH BRACKISH WATER DESALINATION AND RENEWABLE ENERGY

With the deterioration of Tunisia’s aquifers, brackish water represents an increasing share of the country’s water resources. From the 1980s, the government opted for brackish water desalination. Four main stations were set up in the country, ensuring 60,000 cubic metres per day (2008 figures, source Plan Bleu). However, this expensive technology is very energy intensive. So the government’s solution was to develop production units using renewable energy such as solar energy, which is relatively economically viable when brackish water rises to the surface without excessive pressure. In 2006, in the Ksar Ghilane oasis in southern Tunisia, the government opted for the combination of photovoltaic solar energy and desalination through reverse osmosis. Since then, the 300 local residents without access to the power grid no longer have to wait for the rounds of the tanker that previously delivered drinking water from a well some 60 kilometres away. Moreover, the price of the water has been halved.

“There is no single solution. The tools are there to provide multiple options”

MOUNIR LAMINE
National Institute of Fisheries Research (Morocco)

The use of Geographic Information Systems (GIS) and knowledge management tools has become commonplace in Morocco, not only in coastal areas, but also for mainland land management. The more recent use of another tool, the Multi-Agent System (MAS), together with GIS now makes it possible to run complex simulations incorporating multiple variables. Offering the advantage of putting forward various land strategies based on selected parameters, such as the major impact of an industrial activity on its environment, these tools systematically simplify the complexity of the land. They therefore enable each player’s role to be identified more clearly so suitable solutions can be found.
Sometimes the abrupt halt of an industrial activity disrupts the natural coastal environment that it has helped shape. Rather unusually, this has happened in the Camargue since the Salins de Giraud saltworks were closed down. This activity gave the water artificial salinity, which encouraged flamingos to use the area as a breeding ground. The recent closure of the saltworks has upset this balance, and forced a complete reappraisal of the hydrological functioning of this fragile ecosystem. At the request of the Regional Nature Park of the Camargue and its partners, a skills sponsorship programme has enabled voluntary experts from the Foundation Veolia Environnement to carry out a feasibility study and to put forward proposals for alternative scenarios for maintaining the water quality in this aquatic environment and aiding the survival of protected species.

**GUILLAUME SELLIER**
Port-Cros National Park (France)

Given the significant concentration of heavy metals in the harbour water of Toulon, it was time to act. Increasingly restrictive European regulations forced the issue. As it was impossible to carry out additional works along the coastline, using technology became essential. Developing recycling technologies and harbour waste recovery enabled the situation to be resolved. Technology often helps to make great leaps forward, but it must not be an end in itself. In Port-Cros National Park, we have also used very simple drainage techniques that have proved to be entirely suitable.

**KEY FIGURES**

- **10%**
  - exceptional continental biodiversity (10% of global biodiversity but only 1.6% of the surface area of the continents)

- **43**
  - desalination plants to be built in Algeria by 2019

- **500** meters
  - the maximum distance separating every home from the nearest source of drinking water (SPHERE standard)

- **+40** years
  - Over 40: the age of a third of Tunisia’s water system

- **331**
  - European-wide patents filed on water treatment technologies

“We must learn to develop technologies inspired by nature itself”
International operators tend to standardise specifications and distribute technical solutions that must be applicable almost anywhere in the world. The advantage is that at the design stage these tools benefit from substantial investments in research and innovation, involving both exact sciences and social sciences. As a result, these technologies respond in part to the complexity of the problems found across vast, mainly urban, areas. They can be effective and inexpensive for the authorities that manage them if the local or regional context is taken into account. In other words, the stakeholders who will eventually use the tool must be involved from the design stage and during implementation. This also applies to technology transfers, such as training local engineers who will ultimately tailor these tools to the local realities they manage. There are plenty of examples: pieces of software offering improved resource locating, more efficient filtration techniques treating even minimal pollution, implementing local loops mainly for recycling wastewater, and the in-depth study of the new habits of a community that has individual access to drinking water for the first time.
KEY CONCEPTS

**Fishery resources**
Living animal and plant resources from the aquatic environments exploited by humans.

**Gravity-fed irrigation systems**
The gravity irrigation technique involves watering crops by making water flow on to the soil surface. In the majority of cases, the water is transported through open-flow channels. The cost of building a gravity-fed system is 3 to 4 times lower than the cost of a pressure system, and it consumes little energy. On the other hand, the efficiency of these systems is low: more often than not under 30%, while pressure systems easily reach 80 to 90% efficiency. Moreover, gravity-fed systems are very labour intensive.

**Horizontal drilling**
Horizontal drilling enables underground pipes to be passed under waterways, roads, railways, etc. They are designed to house dry networks (telephone or electrical lines) or wet networks (water lines).

**GIS**
A Geographic Information System (GIS) is a tool for modelling and displaying spatially referenced data. It is designed so that summaries to aid decisions on complex planning and management problems can be conveniently extracted.

**LCA**
Life Cycle Assessment (LCA) is an environmental assessment method that enables the user to quantify the impact of goods, a service, a company or a process over its entire life cycle (extraction of the component raw materials, distribution, use, end of life, disposal, etc.). The aim of this assessment is to reduce pressure on resources and on the environment in general throughout the life cycle. Determining product-related impacts may enable improvements to be prioritised and technical and organisational choices to be clarified.

**Non-conventional water resources**
Non-conventional water resources, as opposed to conventional water resources, provide opportunity for water augmentation using recent methods such as the desalination of seawater, the demineralisation of brackish water (ground and surface) and even the reuse of treated wastewater. These methods are increasingly used today in the Mediterranean Basin.

**Reuse of wastewater**
Reusing wastewater involves carrying out several treatments on the wastewater to eliminate impurities so it can be used again. This process can both save water upstream and reduce the volumes of polluted water discharged. Depending on consumer quality requirements, there are two main reuse categories: firstly, potable uses, which can be direct, after extensive treatment, or indirect, after passing through the natural environment; and secondly, non-potable uses in agriculture (irrigation), industry and the urban sector.

**Desalination**
Desalination is a process that produces fresh water from brackish or salt water. Due to high costs, this technique is almost exclusively used to produce drinking water, but it can also sometimes be used to meet irrigation needs. There are several desalination techniques, each producing different yields and residual salt levels.
Financing
THE ACCESS TO WATER AND SANITATION FOR ALL

“Pricing is the result of social compromise”

FINANCING INFRASTRUCTURE AND WATER MANAGEMENT SUSTAINABLY

While the proportion of the population with sustainable access to an improved water source reaches 80% in the majority of Mediterranean countries (2008), the same cannot be said for sanitation. In the Mediterranean, around 27 million people do not have access to an adequate sanitation system, with those in rural areas over 30% worse off than those in urban areas. These figures demonstrate the amount of financial investment still needed. In this region of the world, the cost of implementing widespread access to drinking water and sanitation by 2015 is estimated to be 50 billion euros.

Because of other public infrastructure financing priorities, public services often have to negotiate as authority and State funds cannot meet the extent of the needs. Public authorities often use private operators to optimise the management of existing infrastructure and assess new equipment needs, with water remaining a public service.

THE PRINCIPLES OF BALANCED PRICING: THE ART OF COMPROMISE

Fair pricing is a compromise between efficiency, equality and equity. Economic efficiency requires the recovery of all costs invested in infrastructure, and in maintaining and managing networks, whatever the geographical distribution of the users. People living beyond the network might logically pay a higher price for access than others, but this is difficult to accept for reasons of regional solidarity. Similarly, despite the significant differences in income among users of the same network, it is essential the resource is distributed fairly. For all of these reasons, pricing is therefore an art of compromise that has to be adapted to each region.

“Financing a project means investing in four forms of capital: physical, human, environmental and social”

DOMINIQUE ROJAT
French Development Agency (France)

Financing issues are not the only ones examined by the French Development Agency (AFD) when preparing a project. They are the way, more importantly, for addressing the overall viability of the operation, i.e. effectiveness of technological choices, economic relevance and financial balance, a fair and equitable pricing, together with an appropriate governance that may involve structural reforms. Investment thus bears on the four complementary assets that form the basis of development: physical capital (infrastructure), human resources (training), the environment (natural resources conservation) and social capital (governance).
A whole range of legal and financial arrangements exist to enable public–private partnerships that can be adapted to local situations with the aim of recovering the necessary investment costs (infrastructure, technology choices and water management) over a long period.

These financial arrangements divide responsibilities and investment returns between all the stakeholders. Pricing is the key tool in long-term infrastructure operation, and the price of water set by the parties is always the result of a compromise in which solidarity mechanisms have come into play. But water provision has an overall cost and must have a price – not least to encourage users to consume at reasonable levels.

With the ecosystem services provided by the great water cycle now being taken into account, new financial tools are appearing: for example, Payments for Environmental Services (PES), and individual transferable quotas whose allocation and bidding mechanisms are based on those of the carbon market. The latter are only at the ideas stage.

**INDIVIDUAL WATER METRES: COLLECTIVE RESPONSIBILITY FOR CONSUMPTION**

Detailed analysis of consumer usage by the regulatory authorities and its monitoring by management services means supply and demand can be optimised. The continually improved quality of the offer produces an upward trend in the quantity of water available as a result of using more efficient capture technologies (horizontal drilling and using non-conventional water sources), monitoring technologies (neighbourhood macro-metres) and loss monitoring, etc. In turn, this automatically creates new needs and demand because of new consumption habits. In light of water scarcity, user responsibility must be placed at community level. Individual metres encourage awareness by showing users what they consume.

“A special tariff in Madrid to encourage industry to consume water more efficiently”

**FERNANDO ARLANDIS**  
Canal de Isabel II public company (Spain)

High water demand from industrial manufacturers, particularly in the paper industry, is a problem in the Mediterranean that requires very efficient public management of water resources. Some manufacturers consume water intensively and are paying an ever higher price to do so. So plans for a water recycling scheme were developed in Madrid to address the needs of the highest-consuming manufacturers. But the challenge was knowing how to finance the scheme. The only option was to ask these manufacturers to invest in the new systems themselves, explaining that they would then benefit from a preferential tariff and make financial savings in the long term. By applying a special tariff, the public authorities have resolved the situation, and the work has been carried out. Around 4 million cubic metres of water are now reused each year, meaning less pressure on water resources.
NEW FINANCIAL INSTRUMENTS: PAYMENTS FOR ENVIRONMENTAL SERVICES AND TRANSFERABLE QUOTAS

The starting point for Payments for Environmental Services (PES) are the vital services that nature provides humans free of charge – for example, producing high quality spring water, filtering out pollution through soil, maintaining soil humus principally through forests, and encouraging animal biodiversity and the balance of nature worldwide. Suppliers of these valuable environmental services (including those related to water conservation) are given payments to take steps to protect them in the face of human activity. Remuneration comes through institutions such as state-controlled organisations or river authorities that are responsible for coherent land management. In the Mediterranean, PES systems for hydrological services do not yet exist. Another instrument currently under consideration is the establishment of a local water market. Individual quotas that are transferable between irrigation users could easily be allocated in the context of a river contract, for example.

ROBERT DJELLAL
Veolia Water

Against a backdrop of high tension over water resources, we must provide innovative environmental and community solutions, and plan financial mechanisms that meet the demands of all.

GÉRARD PAUCHET
Veolia Water

Pricing is both a political and an awareness-raising tool. Prices are regulated, set by the authorities and not by public or private operators. The tariff therefore expresses a political signal in a given local and regional situation that has necessitated choices and guidance according to the following two criteria: the availability of the resource and the user’s ability to pay the bills. Additional solidarity options are “social pricing”, with a low price for the first cubic metres used, and the French principle of a solidarity fund financed by a fixed levy on all bills to help those most in need.

“Water pricing: based on an awareness-raising and solidarity policy”

KEY FIGURES

Number 1 tourist destination in the world
09/02/2005
To produce a tonne of wheat: 450 cubic metres of water are necessary in France and 7,850 cubic metres in Libya

Oudin-Santini Law on decentralised cooperation

600 litres of water used on average per bed night in a luxury hotel on the southern shore of the Mediterranean

from 0.35 to 8 €

the energy cost of desalinating a cubic metre of water depending on the type of energy used

1976 first water metres installed

5 billion euros: estimated investment needed to reach the Horizon 2020 initiative for the depollution of the Mediterranean, adopted in 2005 by the Euro-Mediterranean environment ministers

0.35

8 €
Your idea is to link water and energy in terms of financing. Why is that?
Because by combining expertise in water with expertise in energy, water would be available for everyone, and that would be a good way of stamping out water conflicts! Shared technologies and a common management system should therefore be developed for the good of communities. Although energy is used for transporting, treating and recycling water, these two resources currently work in parallel at every stage: research, engineering, service management and pricing. And talking of energy obviously means large investments for public authorities. That is why these crucial goods must be united if we want to properly finance access to water for the greatest number of people.

Do you think the southern countries of the Mediterranean would accept this single bill?
Once again, energy is right at the heart of the water access issue. In olden times, water came from the sky. But the reality today is rather different. Water must be treated and distributed. People readily understand that they have to pay for electric lighting. It is the same for water now. One solution that could make people accept a water price is proposing a joint rate for water and energy.

But how will the poorest people be able to pay?
It is completely possible to apply a social pricing system and it is clear that such a system should play a role. Households in some areas cannot pay. Progressive tariff systems exist with minimum prices that are perfectly fair for the poorest people. In contrast, particularly in tourist areas, tariffs must be higher, in line with the living standards of wealthier populations.

ARE TRANSFERABLE QUOTAS A BAD IDEA IN DISGUISE?

There are three main types of financial instrument for managing water demand: pricing, allocating fixed quotas and allocating transferable ones. The latter are based on the assumption that a water market has been established, along the lines of the carbon market, and are therefore still only a working hypothesis. Their philosophy is based on an annually capped volume of the total consumption of the resource related to a given area. The cap is decided on by the authorities after consulting the parties involved. Once initial individual (or collective) water quotas have been allocated, they become transferable within the market and holders can bring supply and demand into play, the outcome of which is the virtual reallocation of the resource.

The aim is of course to benefit those who manage their allocation carefully and can trade their surplus to more wasteful consumers, who in turn face financial penalties. This incentive tool may be useful for river contracts, for example. Of course nothing is perfect: according to a study conducted in Spain* in 2007, 70% of the supporters of individual irrigation reject this idea. In their opinion, this type of market has inherent risks linked to financial speculation (as evidenced by the carbon market), the technical implementation and the running of this market are a real headache, and there is an appropriate level of suspicion about what they see as a subtle incentive for private ownership of a common resource.

*source: Water demand management in the Mediterranean, progress and policies, Zaragoza, 19-21/03/2007
Equalisation principles

Equalisation is a redistribution mechanism aimed at reducing wealth disparity, and therefore inequalities, between different regional authorities. There are three equalisation principles:
- horizontal equalisation, which involves allocating a share of the richest authorities’ resources to disadvantaged authorities;
- vertical equalisation, provided by State contributions to communities;
- ad hoc equalisation, during new skill transfers from the State to regional authorities, when funds allocated by the State to support these new skills are adjusted according to the communities’ situation.

Decentralised cooperation

Decentralised cooperation means long-term relationships between one country’s regional authorities and another country’s, formalised by agreements. These agreements define the cooperation measures planned and their technical and financial arrangements. Cooperation can take various forms: development assistance, institutional support, management of common goods and services, cross-border cooperation and inter-regional cooperation.

Water-pricing methods

There are three different water-pricing methods:
- proportional pricing, where the price per cubic metre is fixed;
- progressive pricing, where the price per cubic metre increases in proportion to the volume of water consumed (each cubic metre of water costs more than the last), which enables each customer to purchase the first instalment of water at a low price;
- graduated pricing, where the price per cubic metre decreases in proportion to the volume of water consumed (each cubic metre of water costs less than the last), which enables customers to pay lower prices for large volumes of water.

Two-part tariff

The two parts are:
- a fixed price not connected to consumption but to the scale of the service line;
- a variable term proportional to the volume of water consumed.
A two-part tariff is therefore more expensive for users who have a more complicated connection to the network (because they are in a remote location, for example).

Social pricing

Social pricing is a pricing system that takes into account the customer’s socio-economic characteristics in addition to connection and consumption characteristics. It aims to reduce the financial burden of water for some user categories (for example, those on low incomes) by giving them a discount on their water consumption or by offering them financial assistance to pay for their water.

Virtual water

Virtual water refers to the quantity of water consumed during a production process. The concept of virtual water means it is possible to calculate a country’s or a region’s actual water consumption – its water footprint. The water footprint is equal to a country’s total domestic consumption, plus its virtual water imports and minus its virtual water exports. It can be an indicator of a country’s demand on the planet’s water resources.

PES

Payments for Environmental Services (PES) are a mechanism aimed at promoting positive environmental externalities by transferring financial resources from the beneficiaries of certain ecological services to the suppliers or managers of environmental resources. Many PES systems now target hydrological services such as protecting water quality, regulating flows and preserving aquatic habitats. These systems are used in both developing and industrialised countries.
As the work of the Water Think Tank Mediterranée shows, the absolute priority is to improve access to drinking water and sanitation for everyone. This presupposes regulations and tools that make the various uses of the resource compatible in theory and mutually beneficial in practice. This is true for the world, and is even more of a concern in the eastern and southern Mediterranean. In those regions it is an urgent issue that calls first and foremost for political intervention, particularly by the regional authorities. It is essential to know at which level – local or regional – public decisions become effective. Because water is a vital resource, citizens of all generations must take part in the decision-making process. The basin-level integrated management model would seem to be the most appropriate approach. This option may be the only way to avoid conflicts in the future. To implement it we need funds, because we will have to shift from a water policy based on the free or virtually free distribution of a resource with no social, political or environmental merit, to one based on the improved status and increased availability of water. Now more than ever, universities, research centres, institutions and public and private sector operators must work together for the common good and for the benefit of today’s younger generations. In the face of more and more intense and restricting urbanisation all around the Mediterranean, they must be able to anticipate, prevent and, if necessary, manage increasingly complex conflicts over the use of water resources. To help them start devising today the political, technical, socio-economic and financial solutions needed tomorrow, we have to share with them the fruits of our thinking, dialogue and experience that are summed up in this document. It is in this spirit that the Water Think Tank Mediterranée partners are pursuing their work.
In June 2006, H.S.H. Prince Albert II of Monaco decided to set up his Foundation, in order to address our planet’s alarming environmental situation. The Prince Albert II of Monaco Foundation is dedicated to the protection of the environment and the promotion of sustainable development. The Foundation supports initiatives within the fields of research, technological innovation and activities to raise awareness of the social issues at stake. The Foundation funds projects in three main geographical regions: the Mediterranean Basin, the Polar Regions and the Least Developed Countries. The Foundation’s efforts focus on three main sectors: climate change and renewable energies, biodiversity and integrated water resources management.

International Office for Water

IOWater has been developing for 20 years policy making and capacity building for integrated water resource management through:

- **Studies, consultancy, twinnings to**
  - Strengthen skills within local, national and international institutions;
  - Set up strategies and support structuring policies for a good governance of water use and pollution control in the main sectors (water supply and sanitation, industry, hydropower, agriculture).

- **Vocational training**
  - Catalogue-based and tailored training programs;
  - Assistance in creating water training centers.

- **Data & information management to**
  - Set up solutions to manage information and make it accessible;
  - Standardize data exchanges.

IOWater ensures the secretariat of the International Network of Basin Organizations (INBO) and runs EMWIS (Euro-Mediterranean Information System on know-how in the Water Sector).

IOWater is committed in the preparation process of the 6th World Water Forum in March 2012 in Marseille, leading the European regional process.
Veolia Environnement is the world leader in environmental services. With operations on every continent and more than 310,000 employees, Veolia Environnement provides customized solutions to meet the needs of municipal and industrial customers in four complementary segments: water, environmental services, energy services and passenger transportation. Its research quality, expertise and team synergies, mastery of the public-private partnership model and commitment to sustainable development have made them a benchmark player in the environmental field.

Plan Bleu

Plan Bleu is a Regional Activity Centre of the Mediterranean Action Plan, which is established under the aegis of United Nations Environment Programme. Therefore, it works for all the Mediterranean rim countries and the European Community which adopted the Barcelona Convention (1976). It also works in partnership with the Marseille Center for Mediterranean Integration and the Union for the Mediterranean. It is entrusted with producing information and knowledge in order to alert decision-makers and other stakeholders to environmental risks and sustainable development issues in the Mediterranean, and to shape future scenarios to guide decision-making processes. As a key resource for development – notably agricultural development –, water has always been a major issue for Plan Bleu’s activities.

United Nations Institute for Training and Research

The United Nations Institute for Training and Research (UNITAR) contributes to the development of the capacities of thousands of beneficiaries around the world through appropriate training and research in the fields of Environment; Peace, Security and Diplomacy; and Governance.

Within the Governance Unit, the Local Development Programme (LDP) develops the capacity of local actors to achieve sustainable development, thus responding to emerging needs and challenges facing local actors in the effective implementation of sustainable local development. The Programme constitutes an international platform for knowledge exchange, sharing and dissemination of best practice, innovation and lessons learned across cities. It fosters partnership building among public sector, private sector and civil society at local, national and international levels.
MAIN URBAN AREAS
Population (thousand inhabitants)

- 250 - 1 000
- 1 000 - 5 000
- 5 000 - 10 000
- > 10 000