

The importance of Integrated Water Resources Management (IWRM) is becoming increasingly recognized throughout the world and the legislative and regulatory frameworks needed for putting IWRM tools into use are being created and revised. The involvement of stakeholders is encouraged through the establishment of community councils and river basin organizations, which share the responsibility of water management with national institutions. However, the World Summit on Sustainable Development (WSSD) target for the preparation of IWRM and efficiency plans in all countries by 2005 has not been fully met. Furthermore, although water management laws, policies, programmes and regulations do exist, their enforcement and implementation remain problematic. Implementation has proven to be particularly difficult in cases where there has been little public involvement. Hence, facilitating the participation of water users and stakeholders in the management and allocation of water resources remains an important challenge.

The major problem plaguing many of our case study partners is the lack of coordination between institutions and agencies responsible for drafting and implementing policy. This is especially critical for multi-state

countries, such as Mexico where decisions taken at the federal level need to be implemented at the state level. In the State of Mexico, the legal framework has been revised to allow the creation of the Secretariat of Water, Public Works and Infrastructure for Development (SAOPID), which is single-handedly responsible for preparing and implementing State policy guidelines concerning public works and infrastructure development. This secretariat, which reports back to National Water Commission at the federal level, is the first of its kind in Mexico.

Lastly, and perhaps most importantly, the case studies demonstrate that where gross inadequacies exist in the provision of water and sanitation facilities, a lack of financial and human resources capacity can clearly be seen. Human resources capacity is not only essential to the implementation of policies and programmes, but to the proposal of innovative solutions overall. Furthermore, a lack of synergy and an unclear division of responsibility among institutions often exacerbates these problems and inhibits reforms from reaching the local level. Until these issues can be addressed, they will likely remain the most outstanding problems challenging the water sector of developing countries in the near future.

## 1. The Autonomous Community of the Basque Country

The Autonomous Community of the Basque Country (ACB) is one of seventeen autonomous bodies in Spain. It is densely populated, with 5 percent of the overall population of Spain (over 2 million people) living in 1.4 percent, or 7,234 square kilometres (km<sup>2</sup>), of the total surface area of Spain (EUStat, 2005). Accordingly, the population density was 292 inhabitants per km<sup>2</sup> as of 2003. The surface area of exclusive internal basins is around 2,200 km<sup>2</sup> with a population density of over 600 inhabitants per km<sup>2</sup>.

The ACB is a highly mountainous territory located across the western end of the Pyrenees and the eastern part of the Cantabrian Mountains. The Cantabrian-Mediterranean water divide formed by mountain ranges of modest altitude (1,000 to 1,600 m) divides the territory. A great portion of the ACB lies in the Bay of Biscay-Mediterranean watershed. However, on both sides of this basin, there are a series of small catchments, generally characterized by a high level of rainfall and extremely uneven terrain. Rainfall is abundant throughout the ACB, with an annual average of over 1,000 mm and a long-term variability of about 20 percent. Despite its relatively constant levels of rainfall, the region has experienced serious flooding and a number of droughts. The region's rugged surface conditions and high rainfall have prompted ACB to establish an extremely dense hydro-meteorological monitoring network, with over 330 control stations currently in operation.

Urban settlements are the biggest user of water resources. In fact, 72 percent of the overall water demand is utilized for urban consumption, whereas 14 percent is utilized by industry, and the remaining 14 percent



**Map 14.2: Overview of the river basins in the ACB**

Source: Prepared for the World Water Assessment Programme by AFDEC, 2006.

is used by agriculture. Although non-consumptive demands like hydroelectric energy production and aquaculture exert considerable local pressure on the movement of water in the region, these activities do not constitute an important part of the regional economy.

In parallel to industrial and urban development, the quality of the region's water resources and aquatic ecosystems has constantly degraded. In response to this situation, a network with 360 operational sampling points has been set up in order to survey the environmental

status of all aquatic ecosystems and regional water bodies (rivers, lakes, reservoirs, transitional waters, coastal waters and groundwater). The data collected from these points is used to assess the current condition of all water bodies in accordance with the EU's Water Framework Directive (WFD) which entered into force in 2000 (see **Box 14.1**). In order to comply with the WFD, the Basque Government *carried out* a detailed study exclusively on its internal basins, comprising 122 rivers, 4 lakes, 14 transitional water bodies, 44 aquifers and 4 coastal waters, in an effort to characterize the freshwater resources and their associated ecosystems from an environmental and socio-economic perspective.

The Hydraulic Administration of the Autonomous Community of the Basque Country submitted a detailed study to the EU, in which the economic aspects of water use and the environmental impact of humans were analysed for each water body and all protected areas were registered.

The results of these studies have indicated that improving water quality and curbing the destruction of ecosystems remain challenges for the region. While the reclamation and restoration of rivers and estuary banks are, to a degree, feasible and currently underway in the ACB, the

likelihood of their success will depend upon the degree of damage that has previously occurred. Though such projects may not be able to completely restore water resources to their prior conditions, they can nevertheless help to improve their current state. These projects, combined with an increase in the level of public awareness, new laws and directives concerning the region's water resources, have been key in initiating a trend towards the restoration and better preservation of fragile ecosystems.

### Conclusion

In order to promote the sustainability of water resources while meeting the water demands of various sectors, IWRM policies are actively being implemented. Accordingly, the varying water needs of Basque society are fully met, and the full cost of providing these services is recovered through the current water management scheme. The central challenge for the future is to define and successfully implement a series of case-specific and efficient programmes to protect and improve the status of valuable water resources and the associated ecosystems.

## 2. The Danube River Basin

**The Danube River Basin (DRB) covers a vast area of 801,463 km<sup>2</sup>, making it the second largest river basin in Europe, after the Volga. It is also the basin that covers the greatest number of countries in the world, with a total of eighteen states. The DRB lies to the west of the Black Sea in Central and Southeast Europe (see Map 14.2). It discharges into the Black Sea via the Danube Delta, which lies in Romania and Ukraine. With an average discharge of about 6,500 m<sup>3</sup>/sec, the Danube is the Black Sea's largest tributary.**

Due to its large surface and diverse relief, the Danube River Basin has a varied climate and a multiplicity of habitats. The upper regions in the west have high precipitation, whereas the eastern regions have lower precipitation and cold winters. Depending on the region, precipitation can range from less than 500 mm to over 2,000 mm per year, which strongly affects surface run off and discharge levels in streams.

Transboundary and regional aquifers are common in the DRB region. In some cases, groundwater resources represent as much as 30 percent of the countries' total internal renewable water resources. Although aquifers are the main sources of drinking and industrial water in the DRB region, there is little information concerning the availability of groundwater or potential extraction capacity in many countries.

There are 26 major tributaries of the Danube River, all of which have their own sub-basins. The Tysa (also called Tisza or Tisa) River Basin is the largest sub-basin in the DRB (157,186 km<sup>2</sup>). It is also the Danube's longest tributary (966 km). By flow volume, it is the second largest after the Sava River. The Sava River is the largest Danube tributary by discharge (average 1,564 m<sup>3</sup>/s) and the second largest by catchment area (95,419 km<sup>2</sup>). The Inn is the third largest by discharge and the seventh longest Danube tributary.

In the DRB, there are several freshwater lakes of varying sizes. The most prominent are the 'Balaton' in Hungary (605 km<sup>2</sup>) and the 'Neusiedlersee' (also called Fertő tó), which is shared by Austria and Hungary (315 km<sup>2</sup>). Furthermore, the Razim-Sinoe Lake System is composed of several interlinking large brackish lagoons that are separated from the sea by a sandbar.

Some countries such as Austria, Hungary, Romania, Serbia and Montenegro and the Slovak Republic are almost completely situated within the DRB, whereas less than 5 percent of the territories of Albania, Italy, Macedonia, Poland and Switzerland lie in the basin. More than 26 percent of the overall basin population is Romanian. This is by far the largest population group in the DRB, followed by populations from Germany, Hungary, and Serbia and Montenegro.

The International Commission for the Protection of the Danube River (ICPDR) was established in 1998 to promote and coordinate sustainable and equitable water management practices, including conservation, improvement and rational water use. The ICPDR, with thirteen cooperating states<sup>2</sup> and the EU, pursues its mission by making recommendations for the improvement of water quality, developing mechanisms for flood and industrial accident control, agreeing on