



Local Governments and Integrated Water Resources Management in Europe: A Synthesis Report

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Table of Contents

1	Introduction	1
2	Methodology.....	2
3	Evolution and drivers of IWRM in Europe.....	3
4	Some observations of water resources management in Europe at the local level.....	7
4.1	Major priority on drinking water supply and sanitation from Local Governments	7
4.2	The role of active citizen involvement in water supply and sanitation ..	8
4.3	The links between land use planning and drinking water supply and sanitation services	8
4.4	Flood risk management.....	9
4.5	Wastewater treatment as an incentive for local government involvement in basin-wide water management	12
4.6	Water allocation and use as cause of conflicts	12
5	Summary of lessons learned from the experiences of European countries in IWRM.....	13
5.1	Focus on drinking water and sanitation.....	13
5.2	Transparency and social participation are key issues for the development of water services.	14
5.3	Successful integration of Local Governments into Integrated Water Resources Management may require institutional reform	14
5.4	The benefit of establishing operational basin-wide organisations	15
5.5	Establishment of Competent Authorities	15
5.6	Building effectiveness of Local Governments	16
6	Final Comments	16
7	References.....	19

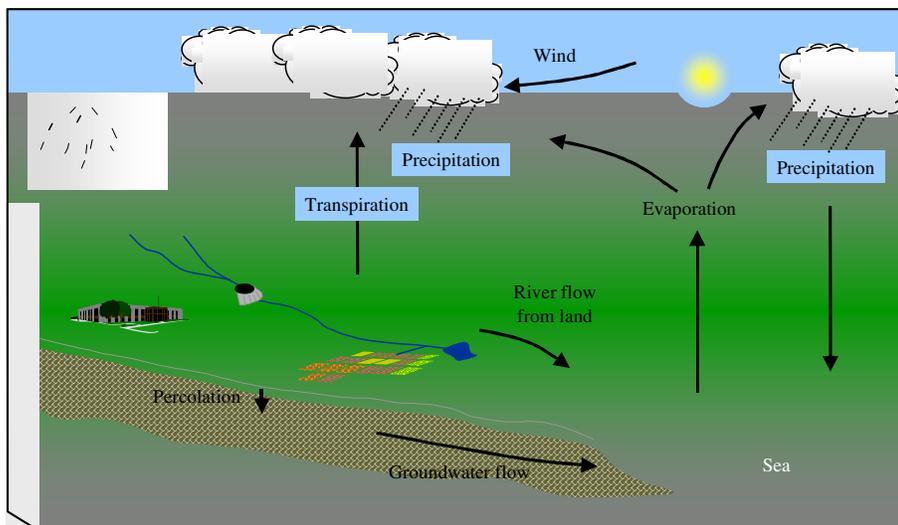
1 Introduction

This document is an output of LoGo Water¹, a research project aimed at improving the capacity of Local Governments to implement Integrated Water Resources Management (IWRM), thus contributing to the achievement of water-related Millennium Development Goals (MDGs).

One of the objectives of the LoGo Water project is to identify good practices and experiences of IWRM at the basin scale, and investigate the role currently played by Local Governments in these good practices. The Logo Water project focuses specifically on contrasting these experiences from some European basins with the goal of helping achieve IWRM in the Limpopo river basin in Southern Africa. This is a key basin in the Southern African Development Community (SADC), involving Botswana, Zimbabwe, South Africa and Mozambique.

As in all parts of the world, water resources are part of the hydrological cycle, a finite system on which we all depend. This is illustrated in Figure 1.

Figure 1. Our water in the hydrological cycle



Source: Sullivan, Meigh and Fediw (2002)

This figure demonstrates why the idea of *integration* in water management is an important concept. This concept relates not only to geographical integration (within a river basin), but is also applicable in terms of harmonisation of methods, approaches and data, to enable more appropriate and reliable decisions about how limited water resources can be more efficiently² managed.

¹ LoGo Water: Towards effective involvement of Local Government in Integrated Water Resources Management (IWRM) in river basins of the Southern African Development Community (SADC) region, EC Contract 003717

² Efficiency here is taken to mean both cost effective and socially efficient.

Despite the significant differences between both continents, there is much potential for river basin management in Africa to learn from the rich and diverse experiences gained in Europe. The following large, and very different, European basins have been chosen as being of particular interest:

- the Danube river basin,
- the Rhine river basin and
- the Ebro river basin.

The continent of Europe encompasses a wide range of different national realities, but throughout we can find a deep and strong tradition of local water management. The major concern driving the role of local governments in water management has been related to the provision of drinking water and sanitation services as a public responsibility at the municipal level. This has evolved over a period of more than 100 years resulting in significant variations between countries within Europe. Since 2000 however, the approval of the Water Framework Directive (WFD) has introduced a new legal framework for water management within the European Union (EU). The overall objective of this directive is to build the concepts of economic, ecological and social sustainability into water resources management. Beyond guarantying efficient urban water services under the responsibility of local authorities, there is a requirement to achieve *good ecological status* of rivers and aquatic ecosystems, strengthening the role of *ecologically* sustainable water management at the basin scale. This is to be achieved through the implementation of new integrated and participative approaches. As a result of the new legal framework of the WFD, European countries are currently involved in launching legal reforms, building new institutions and implementing projects and initiatives to support this, with both failures and successes.

Through case studies from selected European basins, a review of existing experiences on the role of Local Governments in water management has been provided. An attempt has been made to identify the level of Local Government involvement in water management, either at the regional or basin level. Furthermore, new approaches and strategies for IWRM induced by the WFD are examined, with a view to considering their relevance to other parts of the world, including the Limpopo basin.

2 Methodology

This report presents a synthesis of the information and conclusions gathered from three case studies of quite different European river basins:

- the Danube river basin,
- the Rhine river basin and
- the Ebro river basin.

Each of these is briefly described, and placed into its geographical, historical and political contexts. Details of each of these individual basin reports can be found on the Logo Water website³.

The Danube river basin is the second largest river basin in Europe, covering more countries than any other in the world (18 countries). Among these countries, there are several EU

³ www.iclei-europe.org/logowater

member states and also some “accession” states (countries that are candidates or potential candidates to join the EU) within the basin, with quite diverse social and political situations. Due to its great length and diversity, the study of the river basin has been based mainly on a wide desk study, complemented by information from experts and actors in water resources management in the region. Three countries have been selected as the focus for this basin: Austria, Hungary and Romania, the first as a former and rich member state of the EU; the second as a new member state of the EU in deep political, social and economic transition; and the third one as an “accession” country⁴. A number of different city examples highlight the role of Local Government in the different situations.

The **Rhine river basin** covers some of the richest and more developed European countries, such as Switzerland, France, Germany and the Netherlands. The study is divided into two parts, one focussing on the lower Rhine in the Netherlands and the other examining the basin further upstream in Germany. As in other cases, the main effects and consequences of bad practices in the Rhine and the lack of IWRM within the basin emerge at the Delta area. In this case, these effects are grave as about 50% of the Dutch territory lies below sea level (in what is referred to as *polders*). The main problems at the mouth of the river basin have been investigated from the perspective of the Netherlands, with special attention to the rich experience of local institutional involvement (through Water Boards and Municipalities). The findings from this have been based on a wide desk study, consultations and interviews with experts and public authorities.

The **Ebro river basin** is the major river within the semi-arid Iberian Peninsula, and one of the most representative rivers in Mediterranean Europe. Of particular note is the fact that this River Basin was the first river in the world to be managed by a Public River Basin Authority: the “*Confederación Hidrográfica del Ebro*”, created in 1926. The only country involved in this case is Spain, but, even so, the neo-federal structure of the country forces a complex political context, with nine different autonomous regions involved. The study was based on the documentation of the *Basin Hydrological Plan*, and investigations on specific cities and towns. Information was gathered through questionnaires and interviews with respective Local Governments and water operators. These cities and towns are:

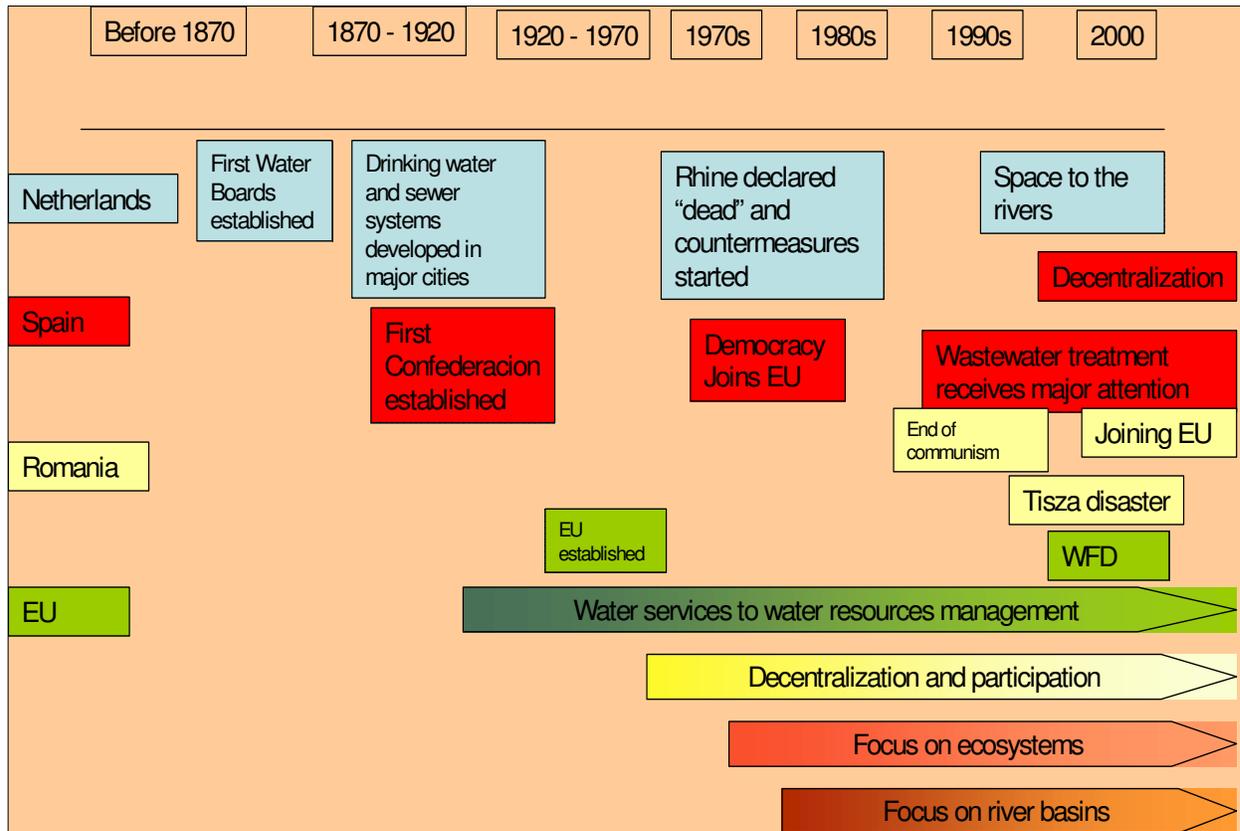
- the city of Vitoria, in the upper Basin (the capital of the Basque Country)
- the city of Saragossa (capital of Aragon), in the central basin,
- the rural village of Tauste, also in the central Basin and,
- the city of Tortosa (in Catalonia) the main town of the Ebro Delta.

These cities have been selected as they are representative both of the different situations and problems along the river and also of the different sizes of urban development within the basin.

3 Evolution and drivers of IWRM in Europe

Europe contains a rich set of very different cultures, historic traditions and experiences related to water management in very different climatic contexts. How European water policy has evolved under these circumstances is shown in Figure 2.

⁴ Romania has since become an EU member state following the conclusion of the Danube basin study

Figure 2. Landmarks in history and the evolution of European water policy

Over time, we find a long tradition of public services existing under the responsibility of Local Governments, resulting in a sort of “*municipal welfare state*”. In many European countries, initially, the private sector has played a key role, but since the early 20th century, strong municipal traditions have led to important collective commitments in order to guarantee access to drinking water and sanitation services, among other public services, as a municipal responsibility. From these traditions, especially those developed in Central and Northern Europe, there are plenty of lessons and good experiences to observe.

After the Second World War, Europe was divided into two blocs, under two different political rationales. In Western countries, these municipal traditions on water supply and sanitation services had opportunities to develop in a democratic context, (with the exception of Spain and Portugal which were then under dictatorial regimes). At that time, Eastern European countries also remained under centralised authoritarian regimes, with fewer opportunities to develop local responsibilities and democratic approaches.

In the post war period, throughout the European continent, rapid economic recovery and development led to the evolution of unsustainable models of water management that brought about a breakdown in the health of many aquatic ecosystems in Europe. In Eastern European countries, the progressive economic crisis and final breakdown of the socialist bloc combined with the lack of democracy, worsened this ecological and social crisis and brought about the grave situations we see at present in some parts of the region.

During the last decades, the main drivers enhancing such shifts and new trends in Europe have been promoted thanks to the existence and development of the European Union. Without any doubt, the environment has been, and continues to be one of the most important fields in EU legislation. New environmental laws and regulations and active environmental policies have been developed with special emphasis in water and aquatic ecosystem management. The serious impacts of many years of agricultural, industrial and urban development have led to the implementation of different Directives over the last 15 years, bringing into force stricter rules and standards. Finally, the recently introduced EU Water Framework Directive⁵, approved in 2000, integrated the different and precedent Directives, and resulted in a shift in the rationale informing water policies from:

- a) the “*resource approach*” towards a new “*ecosystem approach*”⁶ at basin level;
- b) the *traditional technocratic* approach towards new *participative approaches*;
- c) an approach based on municipal boundaries to an approach based on hydrological units;
- d) recognising that all types of water bodies play a role in water provision and should be included.

These lines of change imply a new IWRM approach, following the principles initially proposed by the *Dublin Conference on Water and Sustainable Development* (1992)⁷. Other influences on how this WFD can be interpreted have been more recently introduced by movements such as the *European Declaration for a New Water Culture* (2005)⁸. This is a new holistic approach that recognises and integrates the multiple dimensions of ethical, environmental, social, economic and emotional values at stake. The movement for a New Water Culture has evolved in response to the regressive water policies in place in the Iberian Peninsula. It promotes an IWRM approach that encompasses surface and groundwater management, including quantitative and qualitative aspects, but also the values of quality of life, collective identity and aesthetic beauty embodied within aquatic ecosystems. From this perspective, rivers can no longer be managed as simple sources of water or as a means of evacuating polluting wastes. Rivers can also no longer be considered as simple channels of water, just the same as we cannot consider forests as simple stores of wood.

Under these approaches, there is a requirement for all stakeholders to get involved: not only the main users, such as farmers (irrigation), hydropower companies, technocratic bureaucracies and private or public operators. In the case of water management, we all have a *de facto* right to water and therefore all of society is concerned, and must be involved in the management of aquatic ecosystems and the provision of basic public services such as drinking water supply and sanitation.

⁵ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

⁶ The *resource approach* is used here to represent a supply driven water development strategy, whereas the *ecosystems approach* is one built around the impacts of water management practices on ecosystem health.

⁷ Dublin Statement on Water and Sustainable Development, International Conference on Water and the Environment: Development Issues for the 21st Century, Dublin, Ireland (1992)

⁸ The European Declaration for a New Water Culture was signed by one hundred experts from all the disciplines related to water management models on 18 February 2005 in Madrid, Spain, with the aim to initiate a process of discussion in the academic world.

In Mediterranean Europe, the traditional pressure for developing irrigation schemes has been enhanced by the opportunities given by new markets within the EU, especially concerning gardening and intensive agriculture. This pressure has led to unsustainable irrigation projects, especially in Spain.

In more recent years, new drivers have arisen as a result of the current globalisation process. The international pressures for liberalising public services have had the effect of strengthening the power of transnational corporations, with public institutions becoming weakened. This power which in some cases dominates even governments and parliaments, is undermining the confidence in democratic institutions, and creating serious problems of governance. This general trend has emphasised the ever more pressing need to implement new water management approaches, based on citizen involvement. This approach is in keeping with the principles of pro-active social participation, as established by the *Aarhus Convention*⁹, and embodied in the Water Framework Directive. It is anticipated that this pan-European approach to water management will be able to counteract some of the pressure from the multinationals, by providing a framework under which legislation can be enforced.

The *Water Framework Directive* (WFD) introduces comprehensive river basin management and environmental protection across Europe. Meeting the requirements of the WFD is the dominant water policy objective driving decision-making for both EU member states and accession countries.

The overall goal of the Water Framework Directive is to achieve good water status by 2015 for all bodies of water (inland surface waters, transitional waters, coastal waters and groundwater) and to prevent any further deterioration of their status. For the purpose of this directive, status is determined on the basis of the water ecology because water quality is determined not only by considering the chemical composition of water but also the biota that inhabits it. "Good status" does not only mean 'good chemical status' but also 'good ecological status'.

Central to the WFD is that, for the first time, it will ensure a coordinated and sensible management of the water environment across Europe, on a natural river basin district level. Additionally, the WFD is not concerned only with the quality of a water body within its physical boundaries but also takes into account the interactions this body has with the connected ecosystems around it (e.g. forests, flood plains), including deltas, estuaries, coastal platforms, and any anthropogenic interventions impacting on it, either point sources (e.g. direct discharge of waste water) or non-points sources (e.g. agricultural runoff).

The new ecosystem approach at river basin level imposes serious challenges both in the political and institutional arenas. Even for countries such as Spain, with a long tradition of water management through River Basin Authorities, it is necessary to assume the shift from the traditional "resource approach", towards the new "ecosystem approach". The challenge is even harder in transnational river basins. The integrating effect of EU membership is required for building integrated basin and sub-basin plans and new river basin institutions.

At present, Europe evolves under apparently contradictory centralisation and decentralisation trends. On the one hand, there are powerful regionalist and nationalist trends that lead to decentralised competencies and functions from National Governments towards Regional Governments (as is the case in Spain, Belgium, UK, etc.). Another decentralising trend reinforces the competencies of municipal governments, especially in Eastern countries, coming from centralised systems. But on the other hand, the growth of the European Union is

⁹ The UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters was adopted on 25th June 1998 in Aarhus, Denmark.

leading to a centralisation of important political responsibilities in Brussels. New environmental legislation on water management is one reference in this respect. One of the consequences of this legislation is the obligation of integrating the different local, regional and national water management responsibilities at river basin level.

The *Fifth European Community Environmental Action Programme* (Towards Sustainability)¹⁰ acknowledges that “local and regional authorities have a particularly important part to play in ensuring the sustainability of development through the exercise of their statutory functions as ‘competent authorities’ for many of the existing Directives and Regulations and in the context of practical applications of the principle of subsidiary”. Europe faces the task of integrating both local and regional responsibilities, incorporating citizen participation, in a coherent system, that must be secured by adequate public river basin authorities.

The WFD does not deal with flood management, but recently, a draft directive on this topic is expected to be approved by the European Parliament later this year.

4 Some observations of water resources management in Europe at the local level

4.1 Major priority on drinking water supply and sanitation from Local Governments

There are a number of important lessons which can be learned from the European municipal tradition on public services. The key factor which brought about universal access to safe drinking water in many European countries was the fact that it was seen as a political priority. Basic services such as drinking water supply, and more recently sanitation, have been major priorities for both National and Local Governments. Economically, it was realised that healthy populations were more productive, and as a result, improved water and sanitation were recognised as drivers of economic development. Even when Spain, Portugal or Italy were still poor countries, this political and economic significance led to the free provision of secure public water supplies to everybody in the community (even if it was at first only as public fountains or stand pipes). Throughout Europe, this priority took precedence over street lamps or paved roads. Around this concept of basic service provision as a citizen right, the European municipal tradition has built strong collective commitments over many years.

Going beyond universal access to basic drinking water and sanitation, many European countries now provide a service which achieves the highest level of quality. While clearly the economic capacity of these countries is one of the key issues giving rise to this situation, it is not the only one. The strong priority on basic services assumed by Local Governments and by the citizens is the base of this success. In most cases these services are provided by water utilities.

During the last decade, many *local operators* and *water boards* have merged to create economies of scale. Problems for providing new sources of water and for implementing the sanitation infrastructure required by the new European regulations, are inducing the creation of new public inter-municipal institutions at the county level (“*Mancomunidades Municipales*” and “*Comarcas*” in Spain, or *Provinces* in the Netherland), or the involvement of regional Governments. In the Ebro Basin, the Regional Governments are complementing

¹⁰ Decision No 2179/98/EC of the European Parliament and of the Council of 24 September 1998 on the review of the European Community programme of policy and action in relation to the environment and sustainable development "Towards sustainability".

the municipal capacities in order to meet the European standards in sanitation. In all cases, these processes are under public control at the local level.

4.2 The role of active citizen involvement in water supply and sanitation

This involvement of local and regional governments is based on strong collective commitments and active citizen involvement, especially in central and northern European countries. Transparency and social participation are the keys of participative governance that allows a high level of citizen responsibility, including willingness to pay the full cost required by the service. In other countries, such as Ireland or the Mediterranean countries, the tradition of public water management has not been based on this strong citizen participation. In these cases the principle of “full cost recovery”, established by the WFD, is assumed progressively, but with some problems. In the case of Eastern European countries, under grave economic troubles and coming from an authoritarian and centralist political tradition, citizen involvement is weak and the challenge to build such a participative approach is difficult. This institutional weakness at the local level is leading, in the case of big cities, to widespread privatization processes which are not always the best solution.

Throughout Europe, access to a piped water supply and sewerage may be taken for granted by whole populations in many countries, but in some Eastern European countries, the current state of water and wastewater infrastructure is still inadequate, with an especially grave situation in rural areas. In particular, in the EU “accession countries” only 60% of the population has access to piped water supplies. In Romania in 2000, for example, only 66% of the population had piped water and 52% had sewerage. This illustrates how the issue of water provision is still closely related to the level of economic development in a country, and the existence of some degree of public influence in the political domain.

4.3 The links between land use planning and drinking water supply and sanitation services

One of the main reasons why the provision of drinking water services needs to be linked with water resources management at the basin level is due to the fact that the quality of water abstracted for domestic use affects the costs of the drinking water treatment process; however, the quality of available water resources at local level depends on the management of the river upstream, to land use practices at the basin scale, or in the recharge areas of an aquifer. This relation to land-use practices provides a clear link by which municipalities and other Local Government bodies can have a real impact on the effectiveness of Integrated Water Resource Management. Through the implementation and enforcement of land use planning regulations and other mechanisms, best practices can be implemented in key areas which impact on catchment-scale water quality. Examples of this would include more effective regulation of nitrate management schemes in agriculture, better control of navigation and recreational use to prevent pollution or habitat disruption, and restriction of use to reservoir areas which are crucial domestic water storage systems. Examples of this can be seen already in some parts of the world. For example in Taiwan, local authorities and the national Water Resources Authority ensure public access is restricted on land surrounding the key reservoir serving the capital Taipei; while in Qatar, (a very hot dry region) water reservoirs for the whole population are kept under very secure armed guard.

Wastewater treatment is an area which can be heavily influenced by local authorities, either directly as the operator, or as the client employing others for the task. The location and management of such plants is crucial to downstream water quality, and investment in capacity building to support waste water treatment and other waste management issues would be

money well spent. The whole issue of water quality management and the conservation of ‘good ecological status’ of aquatic ecosystems is a major goal of the EU WFD. This includes conservation of connected ecosystems as forests, flood plains, riverbanks, estuaries, deltas and coastal platforms. To achieve this, it inevitably must be managed at the basin scale, and a requirement is in place to develop appropriate indicators by which such a status can be measured and monitored to ensure its sustainability.

If this view were taken by all communities along a river basin, in any part of the world, the overall quality of water in that basin would be significantly improved. The importance of this for the Local Government body is that the water resources will be secured for future generations, and treatment costs of water purification will potentially be much reduced¹¹. Such reductions could also occur by linking departments such as housing, parks and transport and by designing living spaces which incorporate water into their development process. If this is done at the planning stage, water use systems can be designed to incorporate internal reuse, storm water collection and other techniques to maximise water use efficiency. All these actions, coupled within Local Government agencies with an integrated nutrient management plan, and linked to agriculture, can create a fully functioning biophysically sustainable community. While this vision is certainly far from the reality that most of us face today, it is certainly something we can aim for, and in reality achieve, at the local level.

There is certainly no doubt that today, municipalities and other regional public institutions have full responsibility for controlling and guarantying water supply, sanitation and waste water treatment services. Anyway, depending on the countries, these services are provided by utility companies, which may be public or privately owned, under specific concession contracts and regulation systems. In many countries there are often several different organisations which have an influence or legal right over water, and a major first step towards a real contribution to IWRM is to develop a more integrated approach towards water issues. There is a clear role here for Local Government to take the initiative in bringing about such integration.

4.4 Flood risk management

Traditional flood risk management has been based on hydraulic strategies: mainly large scale dams, to regulate the rivers, and riverbank dykes. Spain, as the first country that created Water Authorities at basin level from the beginning of the 20th century, offers plenty of experience following traditional strategies for territories with strong rainfall variability. Evidence of this is provided by the thousands of dams which are in place in Spain, that country having one of the largest number of dams in the world. Many of these have been constructed to control the irregular fluvial regimes. Even so, the efficacy of this approach is today under scrutiny, especially when we take in account the serious impacts of this strategy, including ecological disturbance both up and downstream, and the flooding of villages and inhabited valleys.

In the Ebro River, at present, the “*Confederación Hidrográfica del Ebro*” (the Basin Authority), with the collaboration of the *Foundation for a New Water Culture* and some municipalities, is designing a strategy for pushing back the river-bank dykes in order to create a *Fluvial Natural Park in the Mid-Ebro*, combining environmental and tourist goals with the aim of giving space to the river and reducing flood risks downstream. For the moment this is just a small project motivated by the EXPO-2008 on “*water and sustainability*”, but it serves to demonstrate how imaginative collaboration can produce real solutions to local problems. In fact, the WFD prioritises the recovery of wetlands and riverbanks as natural cushion against floods under the slogan “*giving room to the rivers*”. This has been controversial in some

¹¹ Local examination of the situation would have to be made to determine if this was the case in any particular location. Factors such as soil types, slope and aspect would all impact on this.

areas, as it can bring about economic costs, but according to the WFD, all the EU member states sharing a river basin have the task to draw up new Water Plans at River Basin level, which must be ready for 2009.

River basin scale planning has been a difficult task in Europe, but during the last decades, a number of flood catastrophes have forced new approaches to be adopted at the international level. The *International Commission for the Protection of the Danube River* (ICPDR) (with 13 cooperating states and the European Union), established in 1998, is an example, and in 2004, the ICPDR adopted the *Action Programme for Sustainable Flood Prevention in the Danube River Basin*. This approach has been taken up and implemented by the International Commission for the Protection of the Rhine created in 1963 between Germany, Switzerland, Luxembourg, France and the Netherlands.

After the floods in the 90's in the Netherlands Rhine and the Mississippi River in the USA, the traditional infrastructure-based approach changed towards a new ecosystem approach, involving using natural processes within our management schemes, rather than trying to control them. This suggests lessons that may be learned from past actions such as:

- irresponsible and ill-advised invasion of river domains for both hydraulic and urban development reasons;
- deforestation of headwater areas and wetland drainage; and
- dredging, channelling and rectification of river courses.

All of these activities have accelerated the fluvial dynamic of the river basin, resulting in increased flood risks downstream. To make matters worse, the impact of climate change is expected to exacerbate the risk of flooding events.

It may be argued that these floods are the result of past bad practices, but in the spirit of *Adaptive Water Management*¹², we need to develop ways of coping with the increased hazards we are now facing. The most effective way for a Local Government to do this right now, is to simply fulfil their ethical duties to the people they represent. Most Local Governments already have a heavy workload to deal with, and often there is competition for a small skills and resource base. If every department puts their own house in order, it will make a huge contribution to the range of potential futures available to the communities that they currently represent.

Philosophers for centuries have discussed the conflict between self interest and altruism, and it is realistic to assume both dimensions of human society will be represented in most countries. As a result, it can be suggested that it does not matter if the preference is for the present over the future, or vice versa, as long as one is careful (and not wasteful) in ones use of both physical and human resources. This means that the decisions made in such an adaptive management regime must of course be cost-effective, but more importantly, be built on a new, more integrated approach. This will involve working with others, using different vocabularies, and being creative in the methodologies used in problem solving.

This change towards an ecosystem approach has been outlined in a recent report '*EU Best Practices on sustainable flood prevention and mitigation* which also puts emphasis on multi-stakeholder participation'. Furthermore, in 2006, the European parliament adopted a "temporary" directive called the "*Directive of the European Parliament and of the Council on*

¹² *Adaptive* water management refers to an approach to water management which incorporates new knowledge and techniques, and increased stakeholder participation. Progress is made through learning from past actions.

the assessment and management of floods" (COM(2006)15)¹³. This was further modified in 2007 when the European Parliament adopted a compromise package agreed with the Council which in essence means the Directive on "the assessment and management of flood risks" is agreed. Formal adoption is expected later in 2007 by the Council.

Depending on the legal and institutional frameworks in each country, the local domain with respect to these practices is different. Local Governments have had long responsibilities of urban and land management along riverbanks, at least in urban areas. Although good urban practices, respecting the natural domain of the river and protecting local citizens are being relatively frequent, many bad practices also exist and it is rare to find good integrated practices between communities within a basin. For example, upstream municipalities, in order to protect the safety of other towns and cities downstream, could implement flood protection plans. In fact, as a result of the formation of the respective River Basin Commissions, programs to manage and reduce risks downstream in the Rhine, Danube and Ebro river basins have been implemented. Based on the principle of '*giving room to the river*', upstream communities have agreed to certain actions, but it is still too early to say how effective this will be. There is certainly a high probability at the very least that they will cushion future impacts of climate change, and the values that can be attached to this land under this new use is likely to increase over time¹⁴. The challenge that must now be addressed throughout the world is that water management strategies should be developed at the basin scale, involving local, regional and national Governments.

In the Netherlands, the National Water Authority (*Rijkswaterstaat*), when addressing flood risks, decided to move away from the traditional strategy of higher dykes and supported the *Ministerial Declaration of Arles* of 4 February 1995, signed by Holland, Belgium, France and Germany, and the *WB 21* policy (the Water Management in the 21st century), promoting measures such as: creating side channels; restoring flood plains and meanders in the river, assigning areas for controlled flooding in case of emergencies and re-locating dykes. In December 2005 a programme of specific local measures was approved with a budget of about € 2 billion for the period to 2015. While this signifies an important policy change, it must be realised that the trade-offs faced by local municipalities and their residents will influence their local economies, and in some cases, issues of national (or international) importance may be the driving force. If this is the case, national authorities will need to address these tradeoffs in such a way as to ensure local economies do not subsidise national ones. At the same time, it is important to have an effective coordination body or regulator, to ensure this is avoided.

Another dimension of the Netherlands case is the fact that it is the downstream section of a large river flowing across much of Europe. To be properly effective, strategies to find *room for the river* must be implemented in all parts of the basin. In Germany, a number of areas have been set aside and assigned for controlled flooding. There are also initiatives to start dialogue across the national borders: 42 Dutch municipalities and 42 German municipalities meet several times a year, as members of the *Association of Riverine Municipalities*. Setting aside land for water, in any densely populated country, where land is scarce, is difficult to achieve. In the Netherlands, it is to be expected that the Municipalities did not always welcome this new approach, even recognising that national interests may have to prevail. As a result, a priority at present is to find ways of balancing these various tradeoffs, so that there may be an equitable outcome for all.

¹³ http://www.floodsite.net/html/eu_directive.htm

4.5 Wastewater treatment as an incentive for local government involvement in basin-wide water management

In most parts of Europe there is no tradition involving Local Governments in water resources management. Nevertheless, stricter pan-European laws and regulations on sanitation are inducing the involvement of municipalities in addressing this challenge. The Directive on Urban Waste-Water Treatment (Directive 91/271/CEE), in force since 1991 and amended in 1998, established the obligation of cleaning up urban returns for all the towns with more than 2,000 inhabitants from 2005. Legally binding, this Directive can impose serious fines for the states that do not meet its standards. This is one of the reasons why indicators are important tools to support this legislation.

Other European policies have promoted water development across the region, and the EU *Cohesion Policies* have provided support to many of the poorest state members, by providing financial incentives to help them to adopt suitable technology for waste-water processing. Most of the water-treatment plants built in Spain and other less developed areas of the EU during the last decade have been possible thanks to the massive European Funds invested. These developments have often required direct involvement of the relevant Local Governments. Another example is provided by the regional programme *IRMA (Interreg. Rhine and Meuse Activities)*¹⁵. This was set up focusing on various trans-boundary projects for water management, spatial planning and damage prevention. In terms of Integrated Water Resources Management, these international basin agencies do have a positive effect, and there is much potential for Local Government agencies to be the implementers of these developments.

For countries outside of Europe, support for these activities could be forthcoming from the EU Water Initiative, and the involvement of Local Governments would be seen as a very positive benefit. In many countries, there is great potential for Local Government bodies to play an active and decisive role in local water management issues. They can build a firm foundation to this by harmonising their data collection on all issues relating to water. Through a more effectively organised system of information, more efficient decisions can be made on the use of scarce resources such as water, or land.

4.6 Water allocation and use as cause of conflicts

Even in small river basins, conflicts can arise over water use. Farmers may face conflict with neighbours over distribution of irrigation water, while local residents may find their water being used by the tourist sector in peak seasons. In some parts of Africa, herders may feel that they must protect their water source from use by others, while in many European countries, there may be conflicts between water for transportation and water use for agriculture, or recreational use and protection of habitats. Globally there are many examples of these local conflicts:

- In the Danube, upstream agricultural water allocations and other diversions have threatened the ecological integrity of the Delta
- In the Soca River in Slovenia, local authorities have implemented by-laws to control activities of canoeists, to protect habitats of endangered species which they believe is important to their sports fisheries industry

¹⁴ Assuming increased urbanisation is likely to reduce 'natural' ecosystems

¹⁵ www.irma-programme.org

- In the Indus, low flows of freshwater into the delta (because of upstream diversions to irrigation) have increased the salinity to the point where mangrove habitats have been destroyed
- In Grenada, water demand from tourism enforces water cuts in residential areas during some seasons
- In many areas of Spain and other Mediterranean countries (Cyprus, Crete), much conflict exists over water used for golf-courses, agriculture and urban supply, especially when drought arrives.

In addition to these local issues, there are many international river basins where conflicts may arise over transboundary water management:

- Conflicts between India and Pakistan over the implementation of inter-basin transfers
- Concern in Iraq that dam building plans of Turkey will starve them of water.
- Vulnerability of downstream countries in every continent
- Even at national level conflicts can arise among regions, as in the case of the Ebro Transfer projected and finally rejected in Spain.

There are however, some interesting success stories:

- In the upper part of the Danube basin, following a serious transboundary pollution incident, an early warning scheme was implemented and a rapid reaction force created to protect the Czech Republic from further pollution from Romania
- In the Orange basin, South Africa secures its water supplies by paying Lesotho for water storage provided by the *Lesotho Highlands Development Authority*
- In the Nile basin, the creation of the *Nile Basin Initiative* has brought about a fledgling river management strategy linking 9 of the 10 riparian countries. Under this structure, it is hoped that a process of benefit sharing will result in a cooperative management scheme for the whole river.

5 Summary of lessons learned from the experiences of European countries in IWRM

5.1 Focus on drinking water and sanitation

One of the main lessons that may be learnt from the European experience in the Rhine, Danube and Ebro basins, is related to **the importance of ensuring basic drinking water and sanitation services**. For example, over the last centuries, universal access to safe drinking water for European populations has been one of the main objectives of public institutions and political representatives. While at first the priority was given in both urban and rural areas to the establishment of safe and free public drinking fountains, close to where everybody lived; today the emphasis is on in-house water provision for all residents. However, the challenge of guarantying universal access to safe drinking water is not only a hydrological and financial question, but also a problem of political priority, especially at a local level. A lack of political

interest and priority is often claimed to be due to a lack of resources, as a way of avoiding the implementation of universal access to water. This is especially true in locations inhabited by disenfranchised political groups, and rural areas where service provision costs are high.

In this context it is important to consider access to drinking water and sanitation services under the scope of international human rights law, as part of these rights ensure living conditions of human beings. For example, in 1977, the basic survival needs were stressed at the United Nations Mar del Plata conference with the following statement: “*all people . . . have the right to have access to drinking water in quantities and of a quality equal to their basic needs*”. In order to generate changes in political and institutional attitudes to comply with human rights legislation and pan European regulations, strong involvement and active commitment of Local Governments is needed. In addition, individual citizens and regional, national and international institutions also have a major role to play.

5.2 Transparency and social participation are key issues for the development of water services.

Beyond basic human rights, the development of efficient domestic urban services for water supply and sanitation must be addressed in a transparent and equitable way. The promotion of transparency is a major, yet often unrecognised, responsibility for Local Governments and public institutions. In this, they must not only promote activities to bring about change, but also disseminate information to generate interest by individual citizens. Social participation reflects the strong commitment of individuals to improving water services, and such participation is crucial to motivate changes at the political level. Within the European Union, there has been many successful experiences in the provision of drinking water and sanitation services by Local Governments. In most parts of the EU, this is an issue which has been seriously addressed except in some rural areas which are still poorly served with water supply and sanitation. Some of these experiences can be found in the European case studies of the Logo Water project (see www.iclei-europe.org/logowater).

5.3 Successful integration of Local Governments into Integrated Water Resources Management may require institutional reform

When considering European examples, it is very important to bear in mind that Local Government participation often requires merging processes at a county or regional level under some form of institutional reform. This can facilitate political harmonisation, and can promote savings through economies of scale and technological capacity. By introducing a regional scale policy or management strategy (as, for example, happened in the Southern African Development Community), the region as a whole will be better able to both address water management challenges, and ensure compliance to equitable standards in regulations relating to pollution monitoring, water abstraction etc. This implies the implementation of the subsidiary principle to Local Governments, and the requirement for complementary responsibilities from national and regional governments, in order to achieve better water service provision, and a greater degree of environmental sustainability.

As underlined earlier, the evolution of river management in Europe now tends towards an approach based on “giving more space back to rivers”. This is embodied in the legally binding *Water Framework Directive*, which emphasises *recovery of the geomorphology* of water courses (as opposed to channelization of the water courses), and to the achievement of *good ecological status* of aquatic ecosystems. These challenges need to be tackled with an

ecosystem approach¹⁶ for planning and managing water at the basin level, transcending national borders if necessary. This implies for example a shift of the management of flood risks from the traditional infrastructure-based approach towards new eco-hydrologic approaches at basin and sub-basin levels.

Within this new context, public participation becomes necessary and different actors (not only public institutions and governments) have to take responsibility. Individuals, through their own choices, and through social movements and the private sector, need to play a role in these new *ecosystem* approaches. The European experience has shown that International conventions and directives (especially the Water Framework Directive, WFD, at the European level) have greatly increased government accountability, promoting public participation in planning and decision-making, and broadening access to information about natural resources. In this structure, the participation of local, regional and national government, and non-government institutions, is essential.

5.4 The benefit of establishing operational basin-wide organisations

When considering the sustainable and integrated management of international river basins, the presence and involvement of international organisations, like the European Union, has been very important. At this level, the adoption of the Water Framework Directive (WFD) is instrumental in promoting social participation, and for ensuring effective influence of local participation in IWRM. Sustainability and pro-active citizen participation (at local, regional and river basin levels) are the essential principles to develop and implement under this new governance approach (e.g. the WFD). Since these are new principles in natural resource management in general, it is too early at this stage to analyse the outcomes of this increased participation in water management. In order to meaningfully implement this more adaptive approach to water management, the private sector must also be involved. It will be important for them to comply willingly with the regulation systems and actively contribute skills and investments to the achievement of the goals of the WFD.

Concerning flood risk management, local responsibilities must be established at two levels: at a city level through good urban practices, respect of the natural domain of the river for example and at basin level through more integrated practices for, for example, ensuring the downstream protection against floods thus ensuring the safety of people not only at local level but also at basin and international level.

5.5 Establishment of Competent Authorities

In order to make a meaningful contribution to the integration process, local and regional authorities have an important part to play in ensuring that the legislation established by the WFD is complied with, using the exercise of their statutory functions as '*competent authorities*'¹⁷. Two key concepts that these bodies must develop are:

- *Integration*, at basin level, and
- the *subsidiary principle*

To date, sanitation and sewage treatment have become key points for integrating the responsibilities of local and regional governments at basin level. The development of, legally binding instruments with serious fines for non-compliance, together with financial incentives for the poorest member states, have given good results in the development of the water and

¹⁶ *Ecosystem approaches* is simply a general term used to indicate a resource management approach which works *with* the natural system, rather than *against it*. (e.g. using wetlands to slow the flow of water as part of flood control, rather than building a concrete dam).

¹⁷ Legal entities recognised in the practical applications of the principle of subsidiary

sanitation sector. There is now a need for this integrative process to be widened to address other water management challenges, building on successes and raising capacity within relevant institutions. Furthermore, Local Governments should take an interest in IWRM at the regional level, and especially at river basin and sub-basin level, where the decisions taken might affect their local situation. Local Governments would then be able to make the transition to '*thinking regionally*' (at river basin and sub-basin level), when '*acting locally*'.

5.6 Building effectiveness of Local Governments

When considering the effectiveness of the role of Local Governments in IWRM, it is especially important to ensure that they are directly engaged in:

- defining mandates (internally and externally),
- promoting the enforcement of standards,
- building public participation,
- developing capacity of the skills base..

If this can be achieved, it will be possible for Local Governments to be able to monitor and manage trade-offs in a publicly transparent way. This will have the effect of increasing public trust, and the potential for the generation of more localised solutions to water management problems. In order, however, for this to be achieved, it is important for donor organisations and regional bodies to empower local bodies through capacity building and, where needed, financial support. Since the accountability of local bodies may be greater than for national bodies, this support can be evaluated and audited to ensure investment effectiveness.

6 Final Comments

Freshwater is much more than a resource; it is the basis of aquatic ecosystems, and core to the survival of all species on Earth. It represents a small, but vitally important proportion of the overall volume of water in the natural hydrological cycle of the world, itself a dynamic and unpredictable system on which we depend. The breakdown of the hydrological cycle and malfunctioning of freshwater ecosystems are the result of unsustainable water management practices which have evolved over many decades of industrial development.

The current process of climate change is likely to increase the level of rainfall variability in many parts of the world, and the food security and other risks associated with this. To protect us from the uncertainties arising as a result of this, we need to develop adaptive water management strategies, integrating all parts of our institutional structures and implementing new ecosystem approaches, based on recovering and conserving the sustainability of all aquatic ecosystems.

During the last two decades, Europe spent a large amount of money on recovering, first the quality of water in rivers, lakes and aquifers, and then trying to establish the good ecological status of these ecosystems. In the 1970s the Rhine River was declared biologically dead and heavy metals were widely found in high concentrations. Water operators had great trouble finding fresh drinking-water sources. In 1987, the *Rhine Action Plan* was approved, and recently more ambitious aims were assumed through the "*Rhine 2020 Programme for the sustainable development of the Rhine*".

During the same period, in Central and Northern Europe, the ecological status of rivers and other water bodies has improved significantly. In Mediterranean countries, this progress took

place during the last decade, but the standards to achieve are still far from being reached in many areas. Eastern countries are just beginning to take on this difficult challenge, but, in many cases, the economic breakdown of a lot of activities (following political change), have fortunately reduced some of the pressures on the environment, and thus impacts have become less severe in some areas.

Urban drainage is another key issue under the responsibility of municipalities and regional governments. Often these are faced with problems arising from high levels of water-use intensity in urban areas, continuous growth of serious pollution problems and increasing flood risks when storms occur. In many cases, severe storm-water overflows can lead to collapse of sewerage systems and water treatment plant. There is much potential for Local Governments to make a great contribution to the solution of this problem by managing storm water flows more effectively in urban drainage schemes.

In many parts of Europe, different projects for regulating these high-flow events have been implemented. These have been based on conventional solutions (such as larger pipe networks, flood control barrages etc.), or on more novel approaches based on innovative techniques, the harnessing of environmental services, or economic measures to control behaviour through taxation, regulation or subsidies. More and more, conventional options are combined with alternative and decentralised strategies such as domestic storm-water storage and recycling, insertion of permeable surfacing in urban areas etc. These drainage approaches need to be accompanied by public awareness campaigns, to reduce the disposal of oil, detergents, paints, and herbicides into public stormwater systems, in order to prevent deterioration of water resources downstream of urban areas. An example of how municipalities can help with this is shown in Figure 3.

Figure 3 Building public awareness of water management: a notice over a drain.



Photo: C. Sullivan

In the case of new urban developments, urban stormwater management systems separated from domestic and industrial sewage systems will reduce these problems. When a separated drainage system is available, the treatment of storm-water run-off (polluted with heavy metals and other toxic substances from traffic, road surfaces etc.) can be achieved through the development of artificial wetlands. This is considered to be a more sustainable and cost effective solution more and more frequently found in many countries of Europe. Overall, this reduces the costs of maintaining water quality at standards appropriate for their use.

This summary report has brought together information from case studies of three major European basins, and it has drawn from the experience from those basins to shed light on how Local Governments can become better involved in Integrated Water Resources Management at the basin scale. It is hoped that this summary document can be of use in generating interest in this subject, and those wishing to take it further can find detailed reports on this issue from the LoGo Water project website. While it is recognised that there are many significant differences in economic and hydrological conditions of Europe and Africa, it is clear that there is merit in examining how other regions have addressed the issue of local water governance, with a view to providing opportunities for water specialists across Africa to reflect on how such a challenge can be best addressed, not only at the basin scale, but also right across the SADC region.

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