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Policy, politics, and water management in the Guadalquivir River Basin, Spain

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[1] Among countries with river basin organizations to manage their water resources, Spain's experience is one of the longest. One of the first basin agencies established in Spain was for the Guadalquivir River in the south. A case study of that river basin and its management indicates how basin management is shaped by political economy factors such as the historical path of the agency's evolution, the basin agency's relationships with central government and with regional or local governments, the patterns of water user representation within the agency, and developments in water law and policy external to the basin agency. The case raises questions about whether and how integrated water resources management at the river basin scale is implemented, even in locations where basin agencies already exist. It also suggests that the politics of management at the river basin level will affect the implementation of national water policies intended to promote integrated management. *INDEX TERMS:* 6319 Policy Sciences: Institutions; 6399 Policy Sciences: General or miscellaneous; 1884 Hydrology: Water supply; 1857 Hydrology: Reservoirs (surface); *KEYWORDS:* Guadalquivir River, integrated water management, river basin management, Spain, water policy

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1. Introduction

[2] Integrated water resource management (IWRM) and organizing it primarily at the river basin level are two of the most common and widely repeated recommendations in the water resources literature of the last decade, if not longer. Basin management is also often associated with the concept of decentralization, of managing water resources at the "lowest appropriate level" [see e.g., *United Nations*, 1992; *World Bank*, 1993; *Lee and Dinar*, 1996; *Solanes*, 1998]. Several conceptual arguments have been presented in favor of decentralization in water resource management and basin-level management in particular: that the whole array of resources and use patterns in the basin will be taken into account, public participation will be greater and broader, management decisions will be based on better knowledge of local conditions, and so on.

[3] Empirical studies of river basin management systems provide opportunities to examine the claims made for basin-level integrated resources management and to explore factors that appear to influence its implementation and outcomes. Because river basin management agencies have existed in Spain since the 1920s and because Spanish water policy has turned toward integrated water resource management since the 1980s, Spain provides a welcome setting for such an examination. As part of a team pursuing a larger project, we recently participated in a case study of the Guadalquivir River Basin in Spain.

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[4] We pursued a case study approach for this project in order to employ a close examination of historical processes and institutional change. Research team members collected documents concerning the origins, processes, and results of decentralization reforms to prepare for interviews with stakeholders during a site visit. The site visit was facilitated by a local university faculty member and expert on the river basin, who arranged interviews and also prepared a background paper on the basin prior to the visit. During the site visit, team members met with basin-level stakeholders, central government officials and basin management agency staff, and a regional government official responsible for water policy and management. The basin stakeholders included representatives of three irrigation communities in the basin, a basin-wide association of irrigation communities, and two different types of urban water supply and sanitation service providers. Although it is impossible to verify the representativeness of the interviewees (in terms of how they compare with all irrigators or all urban suppliers in the basin), they do represent a cross section of the important water interests in the basin. The interviews were focused on understanding the processes of institutional change and the performance of basin-scale institutions, matters closely within the knowledge of the interviewees.

[5] In this study we begin with some context concerning the evolution of Spanish river basin institutions and Spanish water policy and introduce the Guadalquivir Basin and its water resource management problems. We then review the organizational structure of the river basin agency, describe its relationships with other organizations and with water users in the basin, and discuss how some political economy

factors have affected the implementation of integrated water resource management there. Among those factors we highlight the agency's historical path, the patterns of water user representation within the agency, the agency's relationships with other governments, and national-level policy changes which have altered the agency's responsibilities as well as its intergovernmental setting. We conclude by drawing attention to aspects of politics that affect the implementation of river basin management and the outcomes that are realized, which may be relevant to scholars and policy makers in other settings as well.

2. Spanish Water Policy and Institutions

[6] From the latter half of the 19th century to the late decades of the 20th, Spanish water policy emphasized a "structural" approach to alleviating problems of drought, flooding, and supply variability by increasing the availability of water supplies and promoting their use, especially for irrigation. Early national water laws in 1866 and 1879 were intended to promote water use as a means of enhancing agricultural productivity and national prosperity. In the early 20th century, national water plans called for central government subsidization of water projects throughout the country, particularly for irrigation systems. To counter severe agricultural stagnation of the late 1920s, the Spanish parliament adopted in 1933 an irrigation expansion plan that included interbasin transfers of water. These transfers would shift supplies from relatively rich river basins to drier ones to address imbalances in water supply and demand across the country, allowing agriculture to flourish in the southern basins, which had great agricultural potential.

[7] To further the objectives of these water development policies, the first river basin agencies, Confederaciones Hidrográficas (CHs), were created by decree in 1926 for a few basins to promote, construct, and manage water works in cooperation with the central government for the benefit of water users. The CHs were to take the river basin into consideration in creating and executing a general plan of hydraulic works and to seek user participation in drafting the general plan. While created by the central government and remaining agencies of it, the CHs had autonomous management with dedicated budgets and direct legal responsibilities, although the central government reserved the right to designate certain representatives.

[8] During the Franco regime (1939–1975), also known as the "public works state," the central government took on a larger role in developing Spain's hydraulic capacity at a rate of over 1000 Hm^3 per decade [*Bakker*, 2002, p. 775]. User participation within the river basin agencies was dissolved in 1942. Franco's water plan also changed the priority of national water development strategy, promoting industrial development over agriculture and separating irrigation from other aspects of water policy and management. Economic reforms of the 1950s prompted rapid expansion in the industrial and tourism sectors and raised standards of living. These trends contributed to rising water demands and greater heterogeneity of water uses, stimulating another burst of hydraulic works construction in the 1960s and 1970s. During this time, a limited level of user participation was reinstated within the CHs to encourage user cooperation with the administration.

[9] Significant transformations in Spanish government and politics followed Franco's death in 1975. A new constitution was drafted in 1978, creating a federated democratic system whereby the central government shared powers with new regional governments, Comunidades Autónomas (CAs). The new constitution gave these regional governments considerable water management responsibilities, many of which overlapped with responsibilities of the river basin authorities. This overlap was supposed to be resolved by the central government turning the management of river basins that fit within a region over to that regional government (CA), while maintaining central government management through the CHs only for river basins that extended across more than one CA.

[10] During the constitutional reform period, emphasis in the construction of water works changed back from hydroelectric power to irrigation. The 1970s and 1980s became a period of rapid and extensive construction of dams for irrigation, but almost no new hydroelectric dams were constructed. There was also a reconsideration of the organizational arrangements at the river basin level for water works and water management and a reexamination of national water policy. Regulations on new water demands and wastewater discharges had been superimposed upon the existing system during the 1960s and 1970s without revision to the basic water law. Increasingly, Spanish water law was seen as poorly suited for problems of competing water uses, rising awareness of water pollution, and the emergence of an ecological consciousness concerning natural resource management. To adapt to these and other circumstances, a new water law was adopted in 1985, representing a major reform of water policy in Spain. The intentions of the new law were (1) promoting water quality monitoring, protection, and improvement and providing equitable and reliable mechanisms for funding those improvements; (2) bringing groundwater into the system of water use regulation along with surface water, shifting it from private property to public domain status; (3) incorporating economic techniques of water management and implementing greater recovery of water costs from water users; (4) strengthening the river basin authorities through integration of responsibilities at the river basin level; (5) enhancing representation and participation of water users and other stakeholders on the river basin authorities; and (6) instituting a more coordinated water-planning approach, with river basin plans to be reconciled with a national water plan, which in turn would be reconciled with European Union (EU) water regulations.

[11] Further developments after 1985 continued the movement of Spanish water policy away from the traditional structural approach. A significant drought from 1992 to 1995 raised public scrutiny and the political significance of water supply, allocation, and management. A draft National Water Plan proposed in 1993 included large-scale interbasin transfers across the country but was abandoned due to regional opposition, economic concerns, and the increasing influence of conservationists, consumer groups, trade unions, and other representatives of civil society [*Del Moral and Saurí*, 1999]. Abandonment of the 1993 plan signaled the deteriorating power of the "traditional water

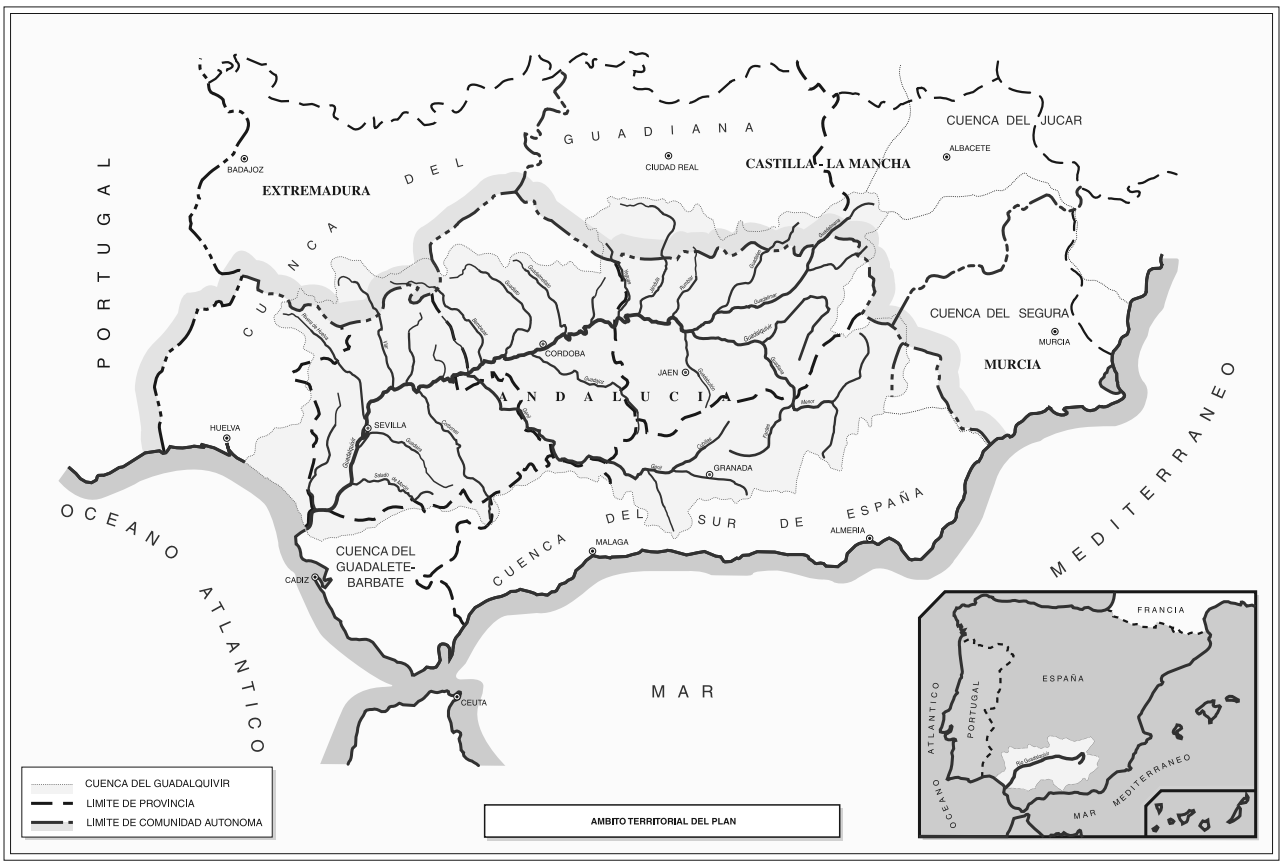

Figure 1. Map of the Guadalquivir River Basin, Spain (From *Confederación Hidrográfica del Guadalquivir* [1995]). See color version of this figure at back of this issue.

policy community" [*Pérez Díaz et al.*, 1996] and of the structural approach in general. In response to the weaknesses of the water allocation system revealed during the drought and to capture aspects of the EU Water Framework Directive of 1998, the 1985 Water Law was amended in 1999. The 1999 amendments broadened the definition of "public waters" by including waters developed through desalination and reuse, tightened water quality requirements, and encouraged accounting for ecological values in water allocation decisions. The system also was to be made more flexible, through provisions for water banks and transfers of water rights. Thus the decade of the 1990s had opened with an ambitious plan to further enlarge Spain's water infrastructure and ended with plans that were scaled back significantly and with water law revisions that increased the emphasis on environmental protection and economic management.

[12] The interrelated developments of this period took place in Spain's more open posttransition political climate. A wider array of organized interests were able to make themselves heard, and water policy making took place in an atmosphere of greater debate and conflict than had been the case through most of the preceding century. Some of the institutional changes during this period also reflected the growing influence of European Union regulations and funding as a stimulus to policy reform. This shift in Spanish water policy from exclusive reliance on structural remedies to an integrated water resource management approach continues into the 21st century.

3. Water Management Problems and Practices in the Guadalquivir River Basin

[13] The Guadalquivir River Basin faces many challenges to water resource management for which the new direction in Spanish water policy is highly appropriate. The Guadalquivir River extends westerly across southern Spain (Figure 1). The entire 640-km stretch of the river itself lies within the autonomous region (the Comunidad Autónoma) of Andalusia. The 57,017-km^2 drainage basin (catchment area) of the Guadalquivir lies almost entirely (90.2%) within Andalusia, with the remaining 9.8% reaching into three other regions, Castilla-La Mancha, Extremadura, and Murcia. As is the case throughout southern (or Mediterranean) Spain, the Guadalquivir Basin has a relatively small share of the nation's water resources, despite having a substantial share of Spain's population. The southern river basins of Guadalquivir, Guadiana, Sur, Segura, and Jucar contain 37% of Spain's population and represent 41% of the Spanish land surface but receive 19% of the country's total precipitation and runoff.

3.1. Irregular Supply

[14] The mean annual flow of the Guadalquivir River is 7230 million cubic meters per year (Mm^3/yr). Mean annual

precipitation in the basin is 596 mm, but this average masks significant variability over space and time. In the low-elevation portions of the eastern area of the basin, average annual precipitation is below 400 mm per year, but it is >1500 mm per year in the mountains. Evapotranspiration rates follow an opposite pattern, being highest in the valley floor and lowland areas (some years >1000 mm) and lowest at the higher elevations. From year to year, precipitation values have ranged from as little as 300 mm to as much as 1100 mm. Furthermore, years of extremely high or low precipitation have tended to cluster together, compounding the effects of droughts or floods.

[15] Seasonal, or within-year, variability of water supplies is also great. Most precipitation is concentrated in the winter months, with peak rainfall occurring from November through March. Long, dry summers follow, during which precipitation is virtually nil and evapotranspiration soars. Storms during the wet months can be true deluges; areas of the basin have experienced rainfall rates of 150–200 mm, nearly half of an average year's precipitation, in just 24 hours. Under such circumstances, the Guadalquivir River and its tributaries can easily overflow their natural banks and inundate adjacent lands.

[16] Variability of precipitation presents water management challenges of flood control and drought protection in order for the land of the Guadalquivir Basin to sustain a substantial population and/or significant agricultural production. Since the basin currently sustains both, water resource management activities in the Guadalquivir Basin for the past century have been focused on regulating river and tributary flows for both flood control and water supply purposes.

3.2. Expanding Demand

[17] Consumptive water use in the basin is dominated by irrigated agriculture, which accounts for ~80% of water consumption. Municipal and industrial uses account for ~12% of consumptive uses, with the remaining 8% apportioned among environmental and other water needs [*CH Guadalquivir*, 1995]. Water use in each category is increasing and projected to increase through at least 2012. With all major sectors of consumptive water use projected to continue growing, intersectoral shifts of water supplies are unlikely to suffice to balance demands with supply.

[18] Irrigated land surface continues to grow in the basin as lands on the adjacent hillsides and farther from the river are brought under cultivation and as groundwater is used to a greater extent. Olive groves cover much of the land in the central portion of the basin and represent a growing share of the region's agricultural production. Throughout the central and eastern portions of the basin, crop types are gradually shifting to higher-value produce such as fruits and vegetables. This has occurred in response to changing market signals, European Union subsidies and regulations, and the ability to use water more efficiently in irrigating orchards compared with field crops. In the lower Guadalquivir Basin between Sevilla and the ocean, however, ~35,000 ha of rice paddies are cultivated, with an estimated water requirement of ~12,000 cubic meters per hectare. The largest irrigation canal in the basin, with a capacity of 90 cubic meters per second at the headworks, serves this area.

[19] Municipal and industrial water uses serve a large and growing population and a changing economy. The basin is home to ~4 million inhabitants and experienced a 5.51% population growth from 1986 to 1996, compared with 3.1% growth for Spain overall, and this phenomenon of faster growth in the basin than in the rest of the country is expected to continue. Already, one tenth of Spanish inhabitants live in the Guadalquivir Basin.

[20] The population expansion reflects increasing urbanization of a predominantly agricultural region. Service industries, recreation, and tourism have expanded as shares of the region's employment and economic product, especially during the 1990s. These expanding industries have not displaced agriculture as the area's dominant economic sector, but they do indicate a gradually diminishing reliance on agriculture as the region's sole defining economic pursuit. They also account for the fact that municipal and industrial water use is rising at a pace equivalent to irrigation's. The development of cities and industry within the basin, as well as irrigation, has been accompanied by an expanded need for reliable and affordable electricity, which has been supplied in substantial measure through hydropower facilities situated on the tributaries and (in a few instances) the main stem of the Guadalquivir River.

[21] Many water users and water managers have described the overall situation of the Guadalquivir River Basin as one of "water deficit." The Andalusian Department of Public Works and Transport estimated the available water resources within the basin to be 3357 Mm^3/yr and total water demands to be 3578 Mm^3/yr, yielding a balance of negative 241 Mm^3/yr. [*Consejería de Obras Publicas y Transportes*, 1997] Thus, even in an average year, water demands in the Guadalquivir Basin exceed available supplies; in a drought, conditions are only worse. The growing urban population and changing economic base of the basin may not have contributed to the water deficit to the same degree as irrigation, but the deficit aggravates the challenges of allocating scarce water supplies.

3.3. Risks and Challenges

[22] The changing composition of water uses is linked to the basin's water management challenges. The flooding risks that result from the climatic characteristics are of greater consequence now that 4 million people live in the basin, and a downstream metropolis (Sevilla) has become home to more than a million residents. Industrial and commercial sites along the river raise the prospective economic losses from flooding. Thus the basin's development combined with its natural tendencies intensifies the water management challenge of flood prevention, control, and response.

[23] The risks associated with drought in the basin, which is also a function of climate characteristics, are further exacerbated by the changing water uses in the basin. The continued expansion of irrigated agriculture and the year-round nature of urban water demands strain the basin's water resources even further during dry periods. The transition of agriculture in portions of the basin to higher-value crops grown in orchards and groves may have a beneficial effect on water use efficiency, but it increases the financial exposure to drought because of the substantial capital investment in those crops. Improved water use efficiency can also reduce the return flows to aquifers and streams that are relied upon by downstream users, who may have to increase the capacity of their diversions from the river.

[24] Taking all the above into account and adding in the flow requirements of hydroelectric facilities, the water management challenge associated with flood and drought protection in the Guadalquivir Basin becomes quite substantial and complex. Maintaining river flows along the entire reach of the river that are adequate to sustain irrigation water demands and hydroelectric generation requirements in the central and eastern portions of the basin, urban water demands at various locations but especially in and around Sevilla, and agricultural water needs in the lower portion of the basin proves particularly difficult. Water shortages create zero-sum situations where meeting the needs of one sector means failing to meet the needs of others.

3.4. Water Quality Problems

[25] Water quality challenges originate from many of the same causes as the water deficit. As agriculture has expanded in the basin, agricultural runoff has contributed to the degradation of water quality in tributaries and the main river stem. Industrial sites within the basin (manufacturing plants, food-processing facilities, etc.) have discharged chemical and other wastes to the river system. The growing urban population requires high-quality water for drinking and generates sewage and wastewater that are discharged to the river system. Municipal and industrial sources of pollution are now covered by regional, national, and EU regulations requiring treatment prior to discharge, but the construction and operation of treatment facilities have not kept pace with the quantities of waste produced and discharged in the basin.

4. River Basin Authority: Decision-Making Structures and Stakeholder Representation

[26] The challenges described above have stimulated the creation of institutional arrangements for water management in the Guadalquivir Basin. Within these arrangements the CH Guadalquivir, established by royal decree in 1927, holds responsibility for developing plans and carrying out policies to address the problems faced within the basin. Its complicated internal organization, the same as other CHs in Spain, appears to reflect the combined influence of three factors: (1) the establishment of distinct offices to correspond with some of the diverse functions of the CHs, (2) the lingering effects of past separation of water management from hydraulic works functions, and (3) the effort to integrate representation of stakeholders, including central government, regional government, water users, and other interested organizations. Table 1 captures the principal organizational elements, with some description provided in sections 4.1–4.3.

4.1. Executive Bodies

4.1.1. President

[27] The CH President, an appointee of the national government, is the central figure and decision maker within the confederación, in what has been described as an ''executive chairman'' position. The president makes many or most of the appointments and decisions governing the CH and serves on and interacts with the CH boards depicted in Table 1. The major staff offices of the CH are appointed by the president and report to him. They are (1) the Water Commissioner, responsible for licensing and policing water uses; (2) the Technical Director, responsible for construction and management of water works; (3) General Secretariat, responsible for the functioning of the internal boards and the day-to-day administration of the Confederación Hidrográfica offices; and (4) Water Planning Office, responsible for preparing and monitoring the Basin Plan.

4.1.2. Governing Board

[28] The basin Governing Board (Junta de Gobierno) serves in a capacity similar to a board of directors. Its primary functions are indicated in Table 1. It is supposed to meet at least once every 3 months and may meet at any other time the president (who also presides over the board) considers necessary. The board includes representatives from the central government, CH staff, regional governments (CAs), and water users as chosen by the water users' assembly. National decrees specify the number of representatives of each type: (1) The Central Government has six members who are designated by the Ministries of Public Works, Transport and Environment; Economy and Finances; Agriculture, Fisheries and Food; Industry and Energy; Defense; and Justice and Interior (The names of the ministries are as listed in Royal Decrees 924 to 931 (21 July 1989. Changes to the names and responsibilities of these ministries have taken place since 1996 (*Boletín Oficial del Estado*, *244*, 2002)). (2) The CH Staff has six members, including the CH President (who chairs the board), the Water Commissioner, the Technical Director, the Chief of Planning, and the General Secretary (who serves as secretary of the board). (3) The Regional Governments have eight members; in CH Guadalquivir, the Andalusian regional government has five representatives on the Governing Board, and the other three regions with portions of territory in the basin (Murcia, Castilla-La Mancha, and Extremadura) have one representative each. (4) Water Users have nine members: Representatives of water user groups are supposed to be at least one third of the total number of board members, with at least one representative for each use type (i.e., urban supply, irrigation, and energy production). Four of the nine represent irrigation users, three represent urban water suppliers, and one each represents hydropower and other uses.

4.2. Management Bodies

[29] Although they too have user representation, the management bodies shown in Table 1 exist mainly to support the functioning of the executive bodies by advising and implementing their decisions. [*Fanlo*, 1996]

4.2.1. Operation Boards

[30] The boards, whose functions are indicated in Table 1, are composed of water users representatives serving 6-year renewable terms and distributed as follows. (1) Urban Water Supply is cities or companies supplying more than 100,000 inhabitants, and they receive a representative for each 100,000 inhabitants, up to a maximum of 4. Smaller urban suppliers are allocated one shared representative for each 100,000 inhabitants or fraction, up to a maximum of 6. (2) Irrigation refers to Irrigation Communities with surfaces >3000 ha, who receive up to a maximum of 6 representatives each. All remaining Irrigation Communities are entitled to at least one shared representative, up to a maximum

Table 1. Boards and Offices of the CH[a]

Board/Office	Description
	Executive Bodies
President, also referred to as Chairman	The President is appointed by the Council of Ministers at the proposal of Ministry of Environment.
Governing Board (Junta de Gobierno), also referred to as Management Board	Headed by the CH President, the board is in charge of financial matters, approves action plans, and defines aquifer depletion and groundwater protection areas.
	Management Bodies
Operation Boards (Junta de Explotación)	There are several of these. They coordinate the management of hydraulic works and water resources in specific catchment areas and/or hydrogeological units. They are composed of representatives of the administration and of the water users (public and private water supply companies, irrigation associations, hydroelectric companies and industrial users). The 1985 Waters Act establishes the rate of representation of each sector on the boards, according to its importance in the basin.
Water Users' Assembly (Asamblea de Usuarios), also referred to as Assembly of Users	Headed by the CH President, it is composed of all users that are part of the Operation Boards. Its purpose is to make recommendations concerning CH policies for the coordinated management of hydraulic works and water resources throughout the basin.
Reservoir Releases Commission (Comisión de Desemblase), also referred to as the Dam Water Releases Commission	Headed by the CH President, it is responsible for making recommendations to the President concerning the appropriate amounts and timing for releasing water from the reservoirs, taking into account the rights of the different users and the aquifers located in the basin. The Water Users' Assembly proposes which users should be members of this Commission. A Permanent Committee of this commission is established to respond to emergency situations such as floods or drought which require unusual measures in relation to the release of water or filling up of reservoirs.
Water Works Commissions (Junta de Obras)	These provide an opportunity for water users who will be served by a particular project to receive information and make recommendations about it.
	Planning Bodies
Basin Water Council (Consejo del Agua de Cuenca)	Headed by the CH President, it is responsible for approval of the Basin Hydrological Plan, which is forwarded to the central Government. It is composed of representatives of different departments of central and regional governments, technical services, and basin stakeholders (at least 33% of council membership) including professional associations and environmental groups.
Planning Office (Oficina de Planificación)	This is a CH staff office headed by the Chief of Water Planning (Jefe de Planification) and is responsible for drafting, monitoring, and reviewing the Basin Hydrological Plan and providing technical support to the Basin Water Council.

[a]Source: *Moral et al.* [2000].

of 6. (3) Hydropower refers to hydropower companies with installed capacity of >50,000 KVA, and they receive one representative for each 50,000 KVA or fraction, up to a maximum of 4. All remaining companies receive one shared representative for each 50,000 KVA or fraction, up to a maximum of 6. (4) Other industrial uses indicate all other industrial water uses, and they receive one representative for each 20 Mm^3/year of water consumption. (5) Other uses indicates the remaining uses (whether or not grouped in Users Communities), and the CH Governing Board will consider the requests of the users involved and decide on the number of representatives, up to a maximum of 6.

[31] Clearly, this representative structure of the Operation Boards assures that irrigation and/or hydropower members outnumber urban and other representatives. This structure, in turn, influences the composition of the Water Users Assembly and the Reservoir Releases Commission.

4.2.2. Water Users' Assembly

[32] The assembly, chaired by the CH President, is composed of the user representatives from all the Operation Boards of the basin. Representatives of the central and regional governments and CH staff are allowed to attend assembly meetings but may not vote. The assembly is supposed to meet in ordinary sessions once a year and may hold special sessions if called by the CH President or requested by at least one third of the members. In addition to its functions indicated in Table 1, the Water Users' Assembly provides an institutional opportunity for important discussion and debate on the main water management issues of the basin. This depends, of course, on whether it is regularly convened and consulted.

4.2.3. Reservoir Releases Commission

[33] This commission (Comisión de Desembalse) meets in October to decide upon the proper filling level of the reservoirs during the wet season and at the beginning of spring to decide upon the allocation of reservoir releases during the dry season. The commission's recommendations must take into account the water supplies expected to be available and the licenses held by water users. The CH President chairs the commission, and the other members are the Water Commissioner, the Technical Director, two central government representatives, one representative of the state electric company, and user representatives recommended by the Water Users' Assembly and appointed by the Governing Board.

[34] Commission members submit proposals for the reservoir water release regimes to the CH President. The president asks the Water Commissioner, the Technical Director, and the Chief of Operations for their opinions. If these agree with the commission's recommendations, their common position is binding upon the president. If not, the president will decide on the basis of the diverging opinions.

[35] The water allocations which the commission must take into account in making its recommendations are established in the Basin Water Plan. Irrigation water allocations are based on hypothetical average values of water demand per hectare for each crop type. Urban water allowances are based on hypothetical average values of water consumption per capita multiplied by population size. Because these water allowance values are not based on data about actual water use, they are subject to some negotiation. Indeed, it is the negotiation of the water allocations each year that attracts user participation in the commissions. Traditionally, the irrigation sector has had a leading role in guiding those commission decisions [*Moral et al.*, 2000; *SIRCH Team*, 2001, pp. 26–27]. This is not surprising since the user representatives to the Reservoir Releases Commission are nominated by the Water Users' Assembly, which is made up of the user representatives from the Operation Boards, which are set up to assure more representatives from irrigation than any other water use.

4.2.4. Water Works Commissions

[36] These commissions are a communication link with prospective users of specific projects. There are several commissions since one may be established for any water project with planned costs greater than US$7 million. Their main task is to inform users with information (especially economic information) about the project. The CH Governing Board determines the number and composition of user representatives to the commissions based on the Technical Director's recommendations.

4.3. Planning Bodies: The Basin Water Council and Office of Water Planning

[37] The central role of water planning in Spain gives a special significance to the National Water Council and the Basin Water Councils. A Basin Water Council approves the Basin Water Plan and any amendments thereto for submission to the central government's National Water Council. The Basin Water Plan is developed primarily by the CH staff (particularly the Office of Water Planning) and the relevant departments of the Ministry of the Environment. The Basin Water Council provides advice and input, represents major water interests, chooses among alternatives suggested by the staff and adopts the plan. The full council meets once or twice per year, but a smaller Executive Committee meets more often.

[38] The major actors involved in water planning (the central government, regional governments, and water users) are represented on the Basin Water Councils, with roughly one third from each group. The councils therefore provide an opportunity for central and regional government to coordinate their activities in water management and planning. User participation was originally limited to user groups represented in other river basin internal committees (irrigation user communities, water supply companies, industrial users, and hydropower companies), but a 1994 decree extended stakeholder participation to one representative of farmers' organizations and one representative of environmental groups.

4.4. Role of Regional Government

[39] Much of the focus on river basin management in Spain is understandably fixed upon the river basin authorities, some of which date back to the 1920s. However, as noted above, regional governments were created in 1978 with policy-making responsibilities that include several aspects of natural resource management, environmental and public health protection, and economic development. Article 148 of the constitution and the ensuing Autonomy Act further defining the regional governments' powers gave the regional governments authority over (1) public works of interest to the regional government within its own territory, (2) implementation of environmental protections, (3) planning, construction, and operation of hydraulic works, canals, and irrigation projects of interest to the regional government, (4) mineral and thermal waters, (5) fishing, with respect to shellfish, aquaculture, and fluvial (riverine) fish, (6) woodland and forestry issues, (7) agriculture and livestock farming, in accordance with general economic planning, (8) land use planning, and (9) promotion of the economic development of the region within the objectives established by the national economic policy.

[40] On the other hand, Article 149 establishes that the central government is responsible, among other things, for (1) public works of general national interest, (2) water resources management in river basins shared by more than one region (this is the particular responsibility of the interregional river basin agencies such as the one in Guadalquivir), (3) basic legislation on environmental protection, and (4) coordination of general economic planning. In addition, Article 132.1 places the central government in charge of the protection of public domain and common property, and Article 132.2 regulates the authority of central government to declare by law natural resources as public domain.

[41] Several offices and departments of the Andalusian regional government have programs or responsibilities relating to water management in the Guadalquivir Basin. They include the Water Secretariat, the Department of Agriculture and Fisheries, the Department of the Environment, and the Department of Health. The regional government has also organized and sponsored a commission, the Andalusian Water Council (AWC), to convene a broad range of water stakeholders for discussion of water policy and planning.

[42] AWC was established in 1994, during the drought, and has continued to meet since (e.g., three times during 2002). The regional government's rationale for creating the AWC is that the drought revealed serious water problems in the region that needed to be addressed regionally and in a participatory framework. The AWC does not have any formal decision-making authority, but can make policy recommendations; for example, it published an "Andalusian agreement for water" in 1994. During 2002, the AWC was considering the development of a regional position on the 2001 national water plan, which would likely recommend improved demand management, control of illegal water uses, and promotion of desalination as alternatives to the plan's proposed interbasin water transfer project.

5. Politics and Policy Making in the Guadalquivir Basin: River Basin Authority Versus Regional Government

[43] The division of responsibilities concerning water resource management in Spain is not as simple as merely identifying interregional basins and intraregional basins and associating the former with the central government and the latter with the regional governments. Although the 1985 water law declared that regional governments have primary responsibility for water management only in intraregional basins, it is also true that the Comunidades Autónomas have authority with respect to some aspects of water resource management even in interregional basins such as Guadalquivir. Furthermore, the regional governments and river basin authorities are linked organizationally: as noted above, Communidad Autonoma representatives sit on some Confederación Hidrográfica boards and commissions.

[44] The evolution since 1978 of central and regional government responsibilities on different aspects of water management has been a dynamic and sometimes discordant process. The regional government's possession of (or at least claim to) so much water-related responsibility and authority presents heightened prospects for confusion and conflict in a river basin such as Guadalquivir which lies almost entirely within the Andalusian region and comprises a majority of the territory and population of that region. The exercise of water-related powers by CA Andalusia can largely overlap the exercise of water management functions by CH Guadalquivir. Similarly, the exercise of water management functions by CH Guadalquivir has great significance to the economy and population of CA Andalusia.

[45] The potential for conflict between regional government water policies and basin authority water policies is heightened by social and political factors. The river basin agency's structure of representation and governance gives greatest weight to irrigation users, and the larger irrigation communities have strengthened their influence within the Confederación Hidrográfica by speaking and acting collectively through Feragua, a basin-wide association of irrigation communities. The regional government, on the other hand, is elected on a one person, one vote system, so its voting base reflects the increasing urbanization of the region's population and economy. To the extent that irrigation and urban water interests in the management of water resources and the operation of river basin facilities come into conflict, those differences may be expressed as divergent views and policies from the CH and the CA. Furthermore, there may be an aggravating partisan factor: the central government (with a prominent role in the CH) has been a Popular Party government from 1996 to 2004, while the Socialist Party prevails in Andalusian regional government. Individuals interviewed for this project disagreed over the extent to which this difference of party control mattered in decisions concerning water management in the Guadalquivir basin, but the existence of the difference was mentioned several times.

[46] The regional government's support of such a forum as the Andalusian Water Council reflects an openly stated desire to develop a leadership role in water policy that the structure of Spanish water management neither explicitly confers nor explicitly forbids. Further evidence of the regional government's intentions in this regard comes from its use of funding authority for intrabasin water projects. The Andalusian regional government has used its funds to promote certain subbasin level changes in water management practices. It has funded treatment plants for the improvement of water quality in the lower basin and near the coast. It has funded irrigation improvements for irrigation communities that have agreed to manage water supplies more carefully and control increases of water demand. It has funded projects for urban water suppliers conditioned on improvements to their management practices, changes in their rate structures to promote conservation, and reduction of flood risks through removal of structures from floodplains. For instance, when Sevilla needed additional secondary wastewater treatment capacity, the Andalusian regional government funded and built the project, then transferred it to the city's water utility, Empresa Municipal de Abastecimiento y Saneamiento de Aguas de Sevilla S. A. (EMASESA), to operate and maintain. The CA's participation was conditioned on EMASESA making improvements to its own works.

[47] An ultimate goal of the regional government appears to be the passage of its own regional water act. Of course, the 1985 national water law and its 1999 amendments could not be contradicted by anything passed at the regional level, but within those contours, there remains considerable room for a regional government to express water policy priorities and adopt policies not currently covered by national law; specifically mentioned to us was the fact that existing national law does not cover drought management.

[48] The regional government has expressed a desire to have other water management functions explicitly transferred to it by the central government. Among the functions mentioned were licensing of water uses, development of interuser agreements for water transfers to deal with shortages, and establishing some subbasin water management organizations (on the view that the river basins are in certain respects too big for effective participation and efficient management). The regional government's Water Secretariat and the Andalusian Water Council would evolve to adopt and pursue some of these policy initiatives if the central government gave them the opportunity.

[49] This, of course, is the view from the regional government's perspective. Other organizations within the river basin did not necessarily share the regional government's vision for its enlarged and more active role in the management of the basin's water resources. CH Guadalquivir,

which is attached to the central government, reiterated the central government position that the Guadalquivir basin is an interregional basin (since 10% of the basin area lies in regions other than Andalusia) and thus is appropriately managed by and through the CH. The association of irrigation communities, Feragua, which is so well integrated into the CH boards and commissions, shared the view that the CH should have the primary water policy and management roles in the basin.

6. A Focus on Representation and Participation of Stakeholders in the Guadalquivir Basin

[50] Tensions over regional government leadership versus basin authority leadership are connected with issues of the representation of water interests in the basin. Uneven representation and participation in decision making at the basin level can result in management practices that deviate substantially from the country's declared water policies. For example, Spanish water law gives top priority to urban drinking water supplies, but this priority is not reflected in practice. Irrigators receive a disproportionately large share of water at a subsidized rate, which poses a problem in periods of water scarcity when cities have insufficient amounts for their populations. Residents of Sevilla endured daily water service outages during the 1992–1995 drought, including up to 12 hours per day without running water. This would seem inconsistent with the notion that domestic drinking water supplies have first call on available water.

[51] Another disjuncture between basin practice and national policy was evident in the contrast between the priorities apparently given to CH Guadalquivir's supply augmentation and demand management functions. The 1985 water law and the 1999 amendments made CHs responsible for licensing water uses, developing and maintaining registries of authorized uses, and monitoring water use to detect and stop illegal water uses. CH staff acknowledged to us that the water use registry for the basin was still far behind completion and that illegal water uses (especially of groundwater) in the basin remained a substantial problem. On the other hand, the staff was able to show us plans that appeared to be kept quite up to date listing the water projects they would like to construct in the basin. The distinction between the staff's high expertise and interest at planning structural projects versus the slow and still incomplete execution of its demand management tasks reinforced the perception that the presence of a basin management agency has not necessarily facilitated the implementation of IWRM as embraced by the 1985 and 1999 laws.

[52] A third example of basin-level practice deviating from national policy involves water transfers. During the 1992–1995 drought the city of Sevilla and some neighboring farmers worked out an emergency exchange that provided Sevilla with some urgently needed additional water. Given this experience and the 1999 amendments to the national water law, an obvious course for the city would be to secure resources for future emergencies by negotiating water transfer agreements with one or more irrigation communities in the area. CH Guadalquivir could broker such arrangements as part of its responsibility for implementing this aspect of the 1999 amendments. Instead, with the CH's support, Sevilla is building a large surface water reservoir at significant financial and environmental costs. The 1999 amendments directed CHs to balance environmental values against the more traditional ''production factor'' uses of water that have taken priority through mitigation measures. Several individuals in the basin mentioned to us that the costs of mitigation measures for the environmental impacts of the new reservoir exceed the construction costs. The project is proceeding despite the environmental degradation and the newly required costs to mitigate it. The old structural policy of solving water scarcity problems by building more structures thus continues to be implemented at the basin level, even though national policy would appear to favor transfers as a more economically efficient and less environmentally detrimental option. Of course, the structural approach protects irrigation interests from water transfers to support the basin's growing urban population and economy.

[53] The strength of the irrigation sector is maintained through both formal and informal relationships and practices. As noted earlier, on the CH Operation Boards, a large Irrigation Community (>60,000 ha) can have six representatives, but the largest of cities (>100,000 inhabitants) can have no more than four. Thus even a city such as Sevilla with more than a million inhabitants will have no more than four representatives on an Operation Board while irrigators can have more.

[54] Informal relationships and practices reinforce this dominance. It was clear from our interviews in the basin that some of the river basin authority boards and commissions with the broadest stakeholder representation, including the Water Users Assembly, meet relatively infrequently. Between meetings, however, irrigator representatives maintain close and frequent contact with CH Guadalquivir staff and officials. The urban water suppliers and regional government representatives did not appear to enjoy similar relationships of easy informal access and expressed frustration at feeling relatively cut off from the CH and its decisions.

[55] At present, there are different levels of interaction and coordination between municipal suppliers and the CH Guadalquivir. At the technical staff level, with respect to management functions such as reservoir releases and the operation of hydropower plants, the interaction and coordination is virtually on a daily basis. With respect to the higher-level policy setting, however, interaction and coordination is reportedly less smooth. There are occasional challenges and disputes; for instance, the municipal supplier for the city of Sevilla has requested sole management authority of the four reservoirs currently serving Sevilla as well as the new one slated for construction. CH Guadalquivir has not yet granted this request and remains reluctant to relinquish authority.

[56] Aside from traditional water policy actors, political parties, trade unions, and environmental groups are openly and actively involved as stakeholders in the water debate. Some trade unions have or are creating specific Environment Departments that develop and represent the union's strategic policy position in the field of water management. Environmental organizations have been gaining some momentum in Spain, and recently, seats have been designated on the CHs' consultative committees for environmental and

consumers' organizations. On the other hand, the groundwater sector and those involved with economic and environmental analysis of water development projects continue to be excluded in basin management decisions to a large extent.

[57] More openly expressed conflict among water stakeholders in Spain reassuringly reflects the fact that debate was muffled for decades through the dictatorship period. However, conflicts concerning water management appear to be taking place outside the river basin authorities rather than finding expression within them. This suggests that a basin authority such as the CH Guadalquivir may still be perceived as a relatively closed agency serving irrigators' interests and is not yet the forum within which a broader range of basin stakeholders express their views and determine basin policy direction.

7. River Basin Authority and River Basin Management in the Guadalquivir Basin

[58] The Guadalquivir example demonstrates the challenges of shifting from the structural policy toward the IWRM objectives embodied in the 1985 water law and ensuing policies. Contemplating those challenges with an empirical case study such as this one may provide some helpful information for the implementation of basin-level integrated water management in other locations. Therefore, in this section we briefly highlight five factors that have contributed to those challenges in the Guadalquivir Basin.

7.1. Path Dependency

[59] The Spanish river basin authorities such as CH Guadalquivir were established primarily to build and operate water supply infrastructure with central government subsidies. Having had a distinct mission for 60 years, an agency may be slow or even reluctant to adapt to a new policy environment that calls for equal attention to demand management, cost recovery, water quality, and ecological values. Also, tangible results are most easily measured and achieved for the construction and operation of water works. Almost two decades after the 1985 water reform law, CHs such as Guadalquivir are still catching up. Water licensing, water use monitoring, fee collection, and cost recovery are being implemented with less vigor or being transferred to other organizations.

7.2. Stakeholder Representation and the Direction of Policy at the Basin Level

[60] It is one thing to promote the concept of basin-level institutions as a way of encouraging stakeholder representation and participation. It is quite another to structure representation and participation processes so that water interests throughout the basin have fair chances of being heard and of influencing basin policy and practice. If one water use sector has favorably weighted representation within the basin authority, basin policy is more likely to reflect its preferences. Other water interests or values may be compromised in ways that veer water management practices away from IWRM principles of equitable and ecologically sustainable approaches to meeting water needs. Furthermore, those who are or perceive themselves as underrepresented within the basin authority may question or reject the legitimacy of its decision making.

[61] In the Guadalquivir case these differences in the representation of stakeholder interests appear to be closely associated to degrees of support for the status quo in the basin versus support for change. The CH staff, with extensive experience in managing structural projects and close connections to the central government, appeared quite supportive of current institutional arrangements and water management practices in the basin. So did the federation of irrigation communities, which dominates the selection of water user representatives on the CH boards and commissions. On the other hand, individuals with urban water supply services and the Andalusian regional government appeared to support substantial additional reform, with respect both to water management practices and to the organizational structure and distribution of responsibilities for water management within the basin.

7.3. Informal Relationships Among Basin Policy Makers and Stakeholders

[62] Formal organizational structures are only one face of representation and participation; informal relationships and interactions may be equally or more important. Although stakeholder representation on the CH's boards and commissions has been expanded, the existing management structure and internal culture of CH Guadalquivir appear to have changed more slowly. The consultative boards and commissions can inform the process (assuming they meet regularly), but formal decision making remains concentrated in the hands of the CH president and board. Informal modes of communication and cooperation between basin-level policy makers stakeholders from particular water use sectors with long-standing ties to them can override or undermine even carefully crafted formal arrangements regarding stakeholder representation or participation.

7.4. Context of Center-Periphery Relations

[63] If national policy delegates some water management functions to basin authorities but other water management functions to closely overlapping jurisdictions, unproductive rivalries rather than polycentric complementarities may result. These problems are compounded when partisan control of the different jurisdictions is divided. These observations are related to a question that is often raised with respect to water governance, namely, whether it is preferable to establish separate basin-scale institutions or work through other jurisdictions that overlap the basin substantially but do not match it exactly. The Guadalquivir case is somewhat unusual in this regard because the sequence of institutional creation is the opposite of what might normally be expected: the basin authorities in Spain existed before the regional governments were created. Nonetheless, the tensions between regional government and basin authority in the Guadalquivir case highlight the importance of the question.

7.5. Degree of National Government Commitment to IWRM

[64] Basin-level authorities are not entirely at fault for delayed or incomplete implementation of IWRM when it seems that the central government has some difficulty making up its own mind about how to proceed. According to *Global Water Partnership Technical Advisory Committee* [2000, p. 71], "IWRM is a process that promotes the

coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.'' Although the 1985 water law directed Spanish water policy toward IWRM, the draft 1993 National Water Plan in Spain seemed to signal a continuation of the traditional structural approach of relying heavily upon subsidized projects to expand water supplies, even with significant risk to environmental needs. The 1999 water law amendments reiterated the commitment of national water policy to the IWRM approach, but the revised National Water Plan adopted in 2002 still contains a large, costly, and potentially environmentally damaging interbasin transfer project that may not be needed if existing water supplies and land uses were managed in a more carefully coordinated way. National water policy and planning is inevitably made through a political process in which regional and sectoral water interests contend for a maximum share of benefits and minimal share of costs, and the seemingly rational balance contained in definitions of IWRM such as the one above is harder to achieve than it is to express.

8. Concluding Remarks

[65] This analysis and critique is not intended to suggest that Spanish water policy in general, or CH Guadalquivir in particular, is completely wrong or ineffective. Changes to Spanish water law and policy in 1985 and since have indeed encouraged a movement in the direction of IWRM, and there are reasons to believe that the existence of basin authorities with formal representation from several types of stakeholders places Spain ahead of many other countries in its ability to implement IWRM over the long run.

[66] The Guadalquivir example does indicate, however, that the existence of basin-scale institutions does not serve as an organizational ''magic wand'' to produce swift and complete implementation of IWRM at the river basin level. National policy makers (and the external analysts and consultants who advise them) must pay attention to political, institutional, and other factors, especially those at the basin level itself, that affect the ability and willingness of basin policy makers to convert IWRM from policy to practice.

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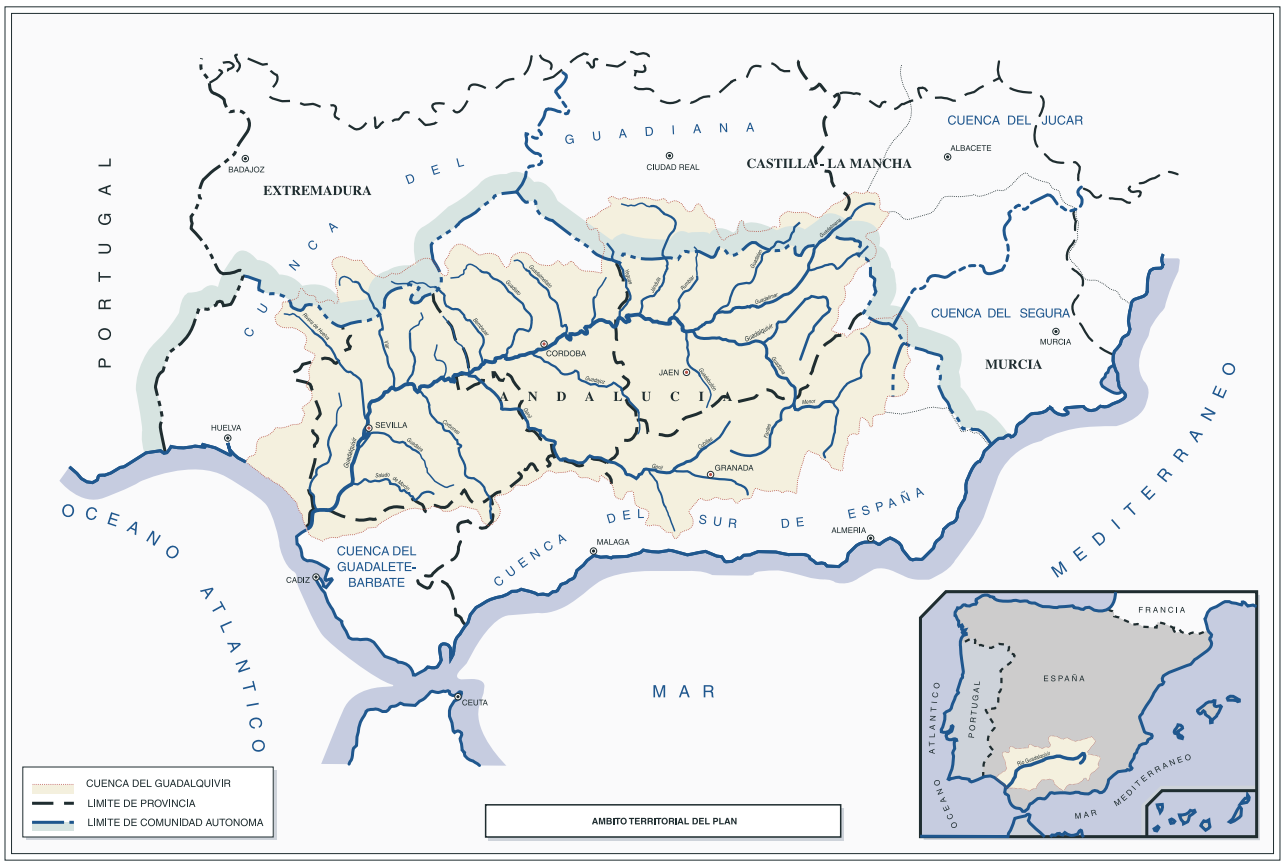

Figure 1. Map of the Guadalquivir River Basin, Spain (From *Confederación Hidrográfica del Guadalquivir* [1995]).