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**From vision to action**



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# The Integrated Water Management in Stressed Basins: Segura River Experience

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## Short summary

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The Segura River Basin (south-east Spain) suffers the lowest annual rainfall rate in the continental Europe (365 mm). However, its weather is exceptional for vegetable production. Its main characteristics are: structural water deficit, good climate for crops, millenary irrigation system (260,000 hectares vital to the socioeconomic support of the region) and advanced water infrastructures system. These features, mixed with cyclic droughts and floods, have designed along the history a special relation between the inhabitants of the region and the environment, while bringing the need of an integrated water system that has been implemented for the last hundred years.

This single management system is based on a Previous Hydrological Planning to control all the water resources: surface water, groundwater, transfers and non conventional resources (reuse and desalination). Six main projects made the System possible: Tajo-Segura Transfer, Modern Irrigation System (by large pressure pipelines), Integrated Urban Water Reclamation and Reuse System, Urban Supply System (to 2.5 Million people), Desalination Plants System and Segura River Regulation Plan (flood defence).

## Key Words:

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*Water, scarcity, flood, drought, transfer, reuse, desalination, integrated system, modern crops.*

## Issues addressed:

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**Water resources management (water-use efficiency, integrated water resources management, transboundary cooperation, sustainable extraction and supply of freshwater)**

- Water-use efficiency: This is the main objective of the case, due to the water scarcity of the region.
- Integrated water resources management: This is the strategy used to apply all the steps: an 'Integrated Water System'.

- Transboundary cooperation: The Tajo-Segura Transfer is the main water infrastructure of the country and a good example of transboundary cooperation between regions.
- Sustainable extraction and supply system: The Segura Basin Hydrological Plan study all the water resources and the requests to keep a sustainable extraction and supply system.

### **Water quality (pollution, dumping of toxic materials, wastewater management, recycling, reuse, restore ecosystems and aquifers)**

- Pollution: The Segura River water quality was the main concern in the region at the end of the last century. It is now the river with less pollution in Spain.
- Wastewater Management: The 'Integrated Urban Water Reclamation and Reuse System' of Murcia Region is an awarded example of wastewater management.
- Reuse: Non Conventional Resources are vital to the irrigation system in the region, provided by the treatment plants.
- Restore ecosystems and aquifers: The Segura River is now alive and the ecosystem is the main beneficiary. Threaten animal species have come back to the water, as well as the river forest.

### **Risks (mortality, economic losses caused by natural and human-induced disasters)**

- Mortality: Caused by floods. The Segura River Regulation Plan has achieved drastic reductions in human losses in the Segura Basin.
- Economic losses caused by natural and human induced disasters: Cyclic droughts and floods have historically caused economic losses in the Segura Basin. The agricultural and industrial activities have caused economic losses by the Segura River pollution.

## **Tools for implementation**

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**Financing/economic instruments:** Reclamation Levy: this tax guarantees the economic sustainability of the 'Integrated Urban Water Reclamation and Reuse System', under the principle "the polluter pays".

**Governance: Institutions / legal framework:** Spanish National Hydrologic Plan and Segura Basin Hydrological Plan: The Integrated Water System needs a previous legal and participative work to determinate the water resources and request, made by the Spanish Government and the Segura Basin Authority.

**Technology:** Irrigation distribution networks: The modern irrigation system of the Segura Basin is controlled by real time technologies what allow to know how much and where is the water every moment

**Capacity development:** International delegations visit every year the Segura Basin to know how we manage the water and to apply our advances in their regions. This capacity development is chiefly applied in the Mediterranean Region.

### **Who is involved?:**

- Segura Basin Authority (Ministry of Agriculture, Food and Environment, Spanish Government): Management of Tajo-Segura Transfer, Segura River Regulation Plan as well as general water management of the region.

- Taibilla Canal Community (Ministry of Agriculture, Food and Environment, Spanish Government): Urban Supply System
- Ministry of Agriculture, Food and Environment: Desalination plants
- Murcia Region Government: Integrated Urban Water Reclamation and Reuse System.
- Tajo-Segura Transfer Irrigation Right Owners (in Spanish, Scrats): Modern irrigation system by large pressure pipelines.

**What were the objectives of the intervention?:** Relieve the water scarcity and improve the environment conditions.

**Implementation challenges:** Efficient use of the limited water resources.

**Main task/activities undertaken:**

- Tajo-Segura transfer, Modern irrigation system by large pressure pipelines.
- Integrated Urban Water Reclamation and Reuse System.
- Urban Supply System.
- Desalination plants.
- Segura River Regulation Plan.

**Main outcomes / impacts (what has changed?):**

- Irrigation sustainability.
- Reduction of the droughts impact to water domestic use and crops.
- Improve of the Segura River water quality and the ponds linked to water treatment plants.
- Drop of the losses caused by floods.

## Lessons learned

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**Triggers:** Water scarcity, water pollution and floods.

**Drivers:**

- Integrated strategy: All the water resources are managed by a single administration.
- Water economic value: Know what are the costs and the benefits of water allow better water governance.

**Barriers:** Local points of view against regional and national strategies.

**What has worked well?:** The six main projects have demonstrated their success.

**What can be improved?:** Water price: We may establish a system of metering and rate-setting the water.

**The way forward:** Increase the solidarity between regions to apply basin and national water policies.

**Links:**

[www.chsegura.es](http://www.chsegura.es)

[www.magrama.es](http://www.magrama.es)

[www.mct.es](http://www.mct.es)

[www.esamur.es](http://www.esamur.es)

[www.scrats.es](http://www.scrats.es)