



## TWINBASIN MISSIONS : REPORTING GUIDELINES

<b>Mission reference</b>
2005 C2 T11 M 1

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<b>Expert Name and function</b>	<i>Expert 1- MANUEL ARNAL LIZARRAGA Expert 2 – ROGELIO GALVÁN PLAZA</i>
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<b><u>Mission Report</u></b>	
<b>Wording of mission</b>	<p><i>The Ebro-Moulouya project is focused on specific areas of interest based on Integrated Water Resources Management (IWMR), that were identified as:</i></p> <ul style="list-style-type: none"> <li>- <i>Monitoring and evaluation of water resources</i></li> <li>- <i>Automatic hydrologic information systems</i></li> <li>- <i>Water quality aspects</i></li> <li>- <i>Environment and sanitation for small communities</i></li> <li>- <i>Flood prevention</i></li> <li>- <i>Drought management</i></li> <li>- <i>Capacity building</i></li> <li>- <i>Water master plan / basin plan</i></li> <li>- <i>Atlas of water resources</i></li> <li>- <i>Dam sedimentation and erosion</i></li> <li>- <i>GIS and spatial data infrastructures</i></li> </ul> <p><i>Based on the TWINBASIN<sup>xn</sup> project principles, it was expected from the missions to:</i></p> <ul style="list-style-type: none"> <li>- <i>Promote a friendly cooperation between water managers</i></li> <li>- <i>Tight ties among river basin organisations (RBOs)</i></li> <li>- <i>Improve communication between the basins participating in the twinning</i></li> <li>- <i>Encourage exchange of expertise, knowledge and technical personnel</i></li> <li>- <i>Strengthen effectiveness of integrated water management within organisations</i></li> <li>- <i>Improve, overall, the functioning of these institutions</i></li> </ul>

### 1. CONTEXT

<b>Place, location</b>	<p><i>Agence Bassin Hydraulique Moulouya BP 703, Bd Hassan Loukili Oujda, Morocco</i></p> <p>The Moulouya basin is located in the North-East of Morocco, covers an area of 74,000 km<sup>2</sup> with a total population of 2.4 million inhabitants. Annual rainfall from 255/mm year, annual discharge 1,500 Mm<sup>3</sup>, 30 small dams and 5 great dams, with a total storage capacity of 1,000 Mm<sup>3</sup>. It is the greatest hydraulic basin in Morocco,</p>
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	but with a semi-arid climate, scarce and irregular water resources limiting socioeconomic developments
<b>Mission duration</b>	<i>27 feb – 01 mar, 2006 (3 days)</i>

## 2. OBJECTIVES

	<b>Initial objectives</b>	<b>Results</b>	<b>Results indicator</b>
<b>1</b>	Prioritization of the main areas of collaboration	<p>Four areas were identified.</p> <ul style="list-style-type: none"> <li>- Automatic Hydrologic systems</li> <li>- Flood prevention</li> <li>- Drought management</li> <li>- Dam sedimentation &amp; erosion</li> </ul>	More information about these topics will be interchanged.
<b>2</b>	To know Moulouya main characteristics and problems	<p>Briefing about Moulouya characteristics. Description of problems of flood, drought and reservoir siltation. Learning from Moulouya experience in coping with reservoir siltation in Mechra Homadi Dam.</p> <p>Moulouya basin has a very torrential behaviour, with high peak flows. Due to the friable materials and the lack of vegetal cover, solid transport is high, and sediments are deposited in the dams at a high rate.</p> <p>Drought management in semi-arid regions is one of the main topics on discussion, in Moulouya the main issue is how to increase efficiency and water storage in order to minimize rainfall irregularity.</p>	Detailed information was provided. Comparison with the activities carried out by the Ebro RBO on the topics, especially on initiatives to cope with reservoir siltation.
<b>3</b>	Discussion of water management practices	<p>Finding different ways of dealing with similar problems. Moulouya is implementing its own system to give and control licenses. In some ways the system already implemented in the Ebro basin could feed the development of Moulouya's. Nevertheless, water laws are different and not all is comparable.</p>	Comparison of different ways, both institutional and technical, to deal with similar problems: water rights and licensing.

## 3. ACTIVITIES DEVELOPED DURING THE MISSION

<b>Activity 1</b>	<b>Topic : <i>Institutional Framework</i></b> <i>(Legal aspects, Regulation, Institutional, Finance, Communication ...)</i>

<p><b>Description</b></p> <p>Exchange of experience</p>	<p>Exchange of experience and learning about the administrative framework of the Agence Bassin Hydraulique Moulouya, description of departments, areas and their functioning.</p> <p>The missions of the agency are:</p> <ol style="list-style-type: none"> <li>1. To elaborate and apply the Integrated Water Resources Master Plan of Moulouya basin</li> <li>2. To manage the water resources of the basin;</li> <li>3. To deliver the authorizations and concessions of use of the hydraulic public domain; -</li> <li>4. To provide a financial assistance of services to the stakeholders or users</li> <li>5. To prevent the water pollution</li> <li>6. To carry out piezometric measurements, gaugings, hydrological or hydrogeologic or planning studies,</li> <li>7. To carry out measurements of quality and to apply the laws relating to the protection of water and the restoration of its quality;</li> <li>8. To carry out regulations and measures, to ensure the supply water in declared shortage or floods;</li> <li>9. To manage and control the use of the mobilized water resources;</li> <li>10. To carry out the infrastructures of prevention against floods</li> <li>11. To hold a register of the recognized rights, concessions and authorizations hydraulic public domain</li> </ol> <p>The Moulouya Agency was created in the year 2000 and it is in process to get full speed. Its means are still limited. The Ebro Organization was created in 1926, it has a long experience but is facing new challenges, such as the implementation of the Water Framework Directive. Moulouya Agency is working on integrated water management and on socioeconomic development. They are working in fields like water preservation, rehabilitation, new infrastructures, flood prevention and groundwater.</p>
<p><b>Activity 2</b></p>	<p><b>Topic : <i>Basin approach</i></b></p>
<p><b>Description</b></p> <p>Increasing of knowledge</p>	<p>Presentation about the Moulouya basin characteristics. Description of the main problems the Agence deals with. Floods and droughts.</p> <p>It must be taken into account that peak flow in Moulouya river can reach up to 7000 m<sup>3</sup>/s whereas the average annual discharge is around 50 m<sup>3</sup>/s, at the same time the difference between the maximum and the minimum discharge can reach a rate of 10 to 1.</p>
<p><b>Activity 3</b></p>	<p><b>Topic : <i>Fighting reservoir siltation</i></b></p>
<p><b>Description</b></p> <p>Field visit</p>	<p>Mechra Homadi Dam. Works to pump silt out of the reservoir and water recovery. The project main aim is to prevent the lack of use of the dam because of the increase of sediments. The reservoir has decreased its total storage capacity from 42 Mm<sup>3</sup> in 1956 to 4 Mm<sup>3</sup> in 2002, and the project will remove 10 Mm<sup>3</sup> of silt. Pumping is an expensive way, but it allows recover the water pumped with the silt to sided small reservoirs. Once the silt have been sedimented on the sided reservoirs it comes back by gravity to the Mechra Homadi Dam. As a result no water has been wasted in the operation, which in Moulouya basin is highly important in order to meet water demands.</p> <p>At the same time, the field visit included references to a water supply project to</p>

	Oujda, Taourit, El Aioun, Saidia and near villages, 530.000 inhabitants.
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**4. LESSONS LEARNT during the mission** *(what could be shared with other partners and/or introduced in guidelines, as far as IWRM is concerned)*

- **About Methodology :**

The Agence Bassin Hydraulique Moulouya has still a short life. It was created for a better water management. It's main objectives are:

- Water resources management:
  - Elaboration and implementation of a Master Plan for Integrated Water Resources Management. The study starts on April 2006.
  - Allocation of water and water saving
  - Water management and monitoring
  - Hydrology and hydrogeology studies
- Public water domain management
  - Water rights register and licensing
- Fighting Pollution
  - Water quality monitoring
  - Measures to prevent pollution
- Flood prevention
  - Warning and prevention
  - Protection
- Information and communication

The Agence is divided in four main departments:

- Water planning
- Water resources and development
- Water quality
- General services

The organization is consistent with the objectives, but the means seem to be scarce.

- **About Practice :**

At Moulouya basin they have a very important problem of dam siltation, due to the geologic and climatologic characteristics of the basin. It means that the working life of the dams can be heavily reduced. It's known that one of the best methods to deal with silt is flushing the sediments, but it implies to lose precious water, so in places like Moulouya basin, where water is so scarce, other means are required. So, there are works in progress at the Mechra Homadi Dam in the Moulouya river to pump silt out of the reservoir, in order to avoid a complete filling, which would involve. In order to prevent water loses in the process, the mud is pumped to some small sided reservoirs; there, the mud sediments and the water returns to the M. Homadi Dam by gravity. So no water is lost.

5. **DISSEMINATION (opportunities and difficulties).** In what measure these learnt lessons are applicable to :

**a) The Basin Organization the expert belongs to:**

Despite we doesn't suffer so high problem of reservoir siltation, the Moulouya practice in Mechra Omadi Dam is very interesting, and could be applicable in cases were flushing sediments is not possible. The practice in Moulouya has been spread to the technical department of Confederación.

**b) National IWRM practice:**

Water management in arid zones has differences with water management in general. Some of Spanish basins have a lot of similarities with Moulouya basin, so dissemination can be achieved through the different Spanish RBO.

**c) Regional experiences:**

In the Mediterranean, aridity and problems like reservoir siltation, are well known, and a sharing of experiences in this field would be highly advisable.

**d) Worldwide :**

It can be interesting in other arid zones

**6. IDENTIFIED TIPS**

⇒ *Identified tips which could be useful for colleagues*

It is important to maintain communication prior and after the mission to ensure its success and fulfillment.

No common language can be a special difficulty. That's why it is important that the exchange of personnel must take this into account. Also, it's important to ensure motivation in the technicians to go on the visit.

**7. PERSONAL COMMENTS**

⇒ *What does the missionary think about his mission*

In spite of the different levels of development, Moulouya basin and Ebro basin have quite a lot of similarities between them, and there are fields where cooperation can be productive.

The Ebro RBO is old, created in 1926, the Moulouya RBO have been created quite recently, so an exchange of views either on how to organize a new institution or how to renew an old one is highly interesting for both.

The scarcity of water is an issue at stake in both basins, though much more severe in Moulouya, so the comparison between different approaches is advisable.

## 8. CONTACTS

☞ *principal local contacts met*

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## 9. BIBLIOGRAPHY

☞ *Main documents, manuals or supports used during the mission which could be useful for colleagues*

Bibliography		
Name	Description / Notice	Reference
<i>The Agence Bassin Hydraulique Moulouya</i>	<i>Information about the Agence Bassin Hydraulique Moulouya</i>	<i>Brochure</i>
<i>The Opération de désenvasement du barrage Mechra Homadi</i>	<i>Information about the works for pumping silt at Mechra Homadi Dam</i>	<i>Brochure</i>

Websites		
Name	Description / Notice	Address
<i>Agence Bassin Hydraulique Moulouya</i>	<i>Information on the Institution</i>	<a href="http://www.eaumoulouya.ma">www.eaumoulouya.ma</a>

*N.B. This framework provides necessary information for further capitalisation and dissemination, but should not prevent experts from making any other comments (as far as basins characterisation is concerned, for instance).*