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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
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Standing Committee
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Possible New File

**Odelouca Dam
(Portugal)**

Report by the Government

Document prepared by
Ministério das cidades, ordenamento do território e ambiente
Instituto daÁgua



MINISTÉRIO DAS CIDADES, ORDENAMENTO DO TERRITÓRIO E AMBIENTE
INSTITUTO DA ÁGUA

**ODELOUCA DAM
(PORTUGAL)**

**CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND
NATURAL HABITATS**

Standing Committee, 23rd meeting, Strasbourg, 1-4 December 2003

**DOCUMENT CONTAINING THE POSITION OF THE PORTUGUESE NATIONAL
AUTHORITIES, CONCERNING THE CONSTRUCTION OF THE ODELOUCA
DAM**

This document conveys the Portuguese national authorities' position on the imperious need of the Odelouca Dam construction, for the purpose of supplying water for public consumption to the Western Algarve ("Barlavento"). At present, the region already experiences a serious water shortage problem in dry years. Some main conclusions are presented, bearing in mind the number of available detailed specialized studies produced these last years on the subject of Odelouca Dam justification and on the appurtenant environmental measures.

1. Introduction

The Portuguese Ministry of Environment, through the Water National Institute (INAG), is the promoter of the dam.

Odelouca reservoir is a part of the primary water multipurpose supply system to the Western Algarve, and with its present revised size its sole intended use is public consumption.

Odelouca dam is an earth dam 73m high, located in the Odelouca river, upstream of the confluence of the Monchique river.

The studies for the present dam started in 1995, and the projected initial layout for the dam was submitted to an environmental impact assessment process in 1996. This initial layout was for a larger dam, situated downstream of the Monchique/Odelouca rivers confluence.

The process led to the revision of the intended solution and to the comparison of three alternatives. These were then submitted to a new environmental impact assessment process and, at the end of 1998, the chosen solution for a smaller dam, that freed the Monchique river (of particular conservationist importance, as described in the environmental impact studies), was approved.

Several specific and detailed studies were conducted to confirm the need to build the dam, namely on the aquifers behaviour under several hypothesis of water use, on the simulation of the water resources system in Western Algarve and on the revision of the water balance for several scenarios¹.

2. Sustainability of water resources management in the Algarve region

¹ "Simulação do Abastecimento de Água ao Barlavento Algarvio", Chiron, Maio 2002

"O aproveitamento sustentável dos recursos hídricos subterrâneos do barlavento algarvio – elementos para a verificação da exploração de armazenamento hídrico alternativo ao da projectada barragem de Odelouca", INAG, Maio 2003

"Algarve – Barlavento. Estimativas de Disponibilidades e Necessidades de Água", Julho 2003

The sustainable character of water resources management in Portugal is pursued by the continuous effort of the Portuguese Government in diagnosing, planning and enforcing the overall best possible water resources policies.

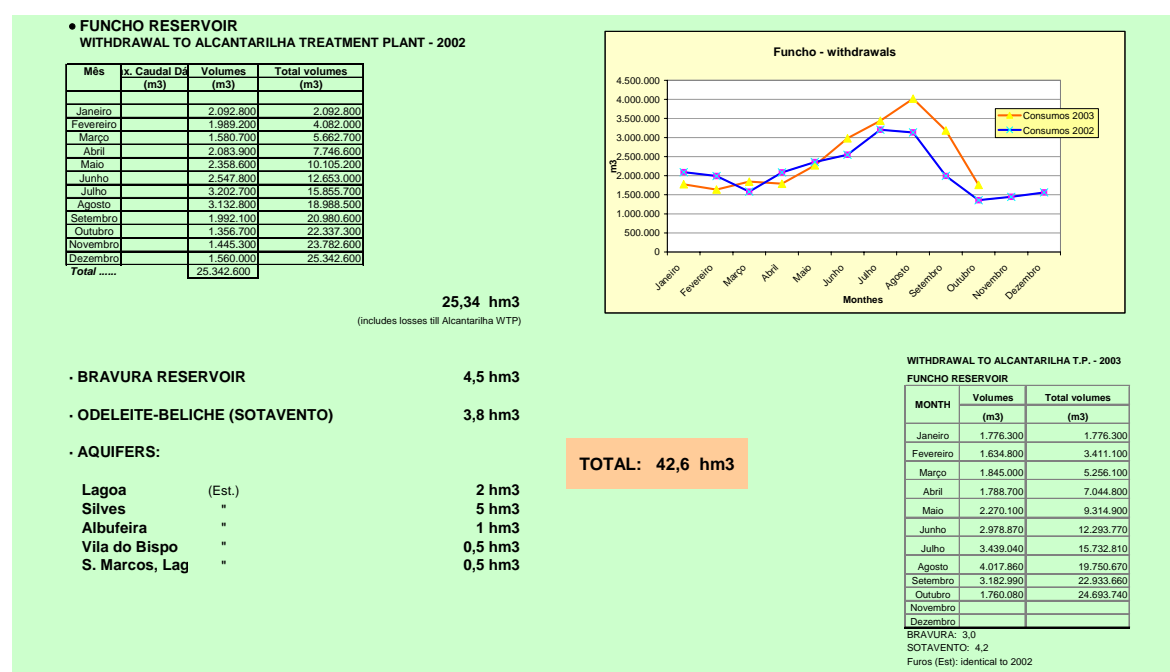
The “Algarve River Basin Plan” (PBHRA)² was approved by the Decree nº 12/2002, of 9 March 2002. This is the general reference framework for supporting the water management in the region in the next few years. The Plan presents in a detailed form all pertinent aspects of water resources planning for the Algarve region. It includes studies about characterisation of the river basins, social and economical analysis, available water resources, land use and management, water uses and needs, water quality, analysis of risk situations, institutional and legal framework, and economical, financial and fiscal analysis.

In particular, the Plan fully comprises the construction of Odelouca dam for water supply for domestic purposes to the Western Algarve.

3. Water balance

Considering the actual water uses in the Western Algarve in 2002, the total water volume withdrawn from sources was of 42 hm³, as seen in figure 1:

Figure 1 – Water consumptions, Barlavento, 2002/2003



The volumes corresponding to extractions from reservoirs and to the water transfer from the Eastern Algarve are all monitored, so even though values from aquifers, exploited by the Municipalities, are estimates, the 42hm³ total is quite precise.

This volume of 2002 is by itself alone significantly larger than the estimates for the year 2025 presented by the LPN, in its complaint to the Bern Convention, allegedly based on the consultation of official documents.

² Plano de Bacia Hidrográfica da Ribeiras do Algarve

It so happens that the referred estimates don't consider all the needs, and that the cited documents were elaborated in respect of a broader territorial analysis, for the entire Portuguese country, and so are less accurate concerning the fluctuating needs, of great weight in the Algarve.

The PBHRA contains the most thorough and recent data collected in the region. Concerning demographic issues, PBHRA aggregated data from a local authority's level.

In Table 1 a synthesis of PBRHA results is presented:

Table 1 – Population and needs, “Algarve Rivers Water Basin Plan” (PBHRA)

	Resident population	Resident population served	Needs for resident population served	Fluctuating population in August	Needs for fluctuating population*	Needs for public supply	Needs for Industry	Total needs **
	(inhab.) (1)	(inhab.) (2)	(hm ³) (3)	(inhab.) (4)	(hm ³) (5)	(hm ³) (6 = 3 + 5)	(hm ³) (7)	(hm ³) (8)
2000	143.047	119.278	11,1	610.347	30,2	41,3	0,8	46,3
2020	222.435	216.661	18,8	951.833	55,8	74,6	1,2	77,5

* Calculus based on the average value of the fluctuating population throughout the year.

** Needs corresponding to the water supply of 100% of the permanent and fluctuating populations and of industry, that is, the maximum theoretical objective to be attained. Effective needs – columns 6 and 7 – will be as close as the attainment level will allow.

Values belonging to the table correspond to the addition of the values from the “Planning Homogeneous Regions” of Alvor, Arade and Costa Ocidental and 2/3 of the value of Zona Central.

The urban consumption estimated in the project for the horizon of 2025 is 75 hm³, as presented in the Environmental Impact Study. This value can be argued, as future estimates are difficult to make and imply the combined consideration of a number of different factors and scenarios. However, the good relation with PBRHA estimates should be enhanced.

The report of the governmental Evaluation Commission draws its conclusions on the Querença-Silves aquifer, the greatest and best aquifer of the region, from a specific study presented at the EIA³. What this study says is that the average renewable resources are of approximately 70 hm³/year (69±17 hm³, 86 being the upper limit of this variation interval). It also says that the aquifer is already significantly in exploitation (53 hm³) and that no more than 15hm³ should be withdrawn in the future.

The mentioned report also expressly states other fundamental aspects of uncertainties and difficulties in withdrawals, besides numbers: water quality, lowering of the aquifers, public and private domains, as defined by the water laws, and conflicts with existing uses, location of withdrawals and associated costs. The complainant doesn't cite these.

In the recent studies by INAG, a simulation of the aquifer behaviour in cycles including dry years was performed, and a proposal is made in order to limit further extractions from the aquifer, avoiding both quality degradation in dry years and the risk of getting an unbalanced situation between renewable yield and reserves.

The above shown 2002/2003 water supply scheme is unsustainable right by itself. What has been done in exploitation so far, while Odelouca dam is not available, is to force the use of Funcho reservoir (more than 25 hm³) beyond its remaining regularizing capacity (20 hm³ at the most), by lowering it too much. Whilst this usage has been possible in years with good precipitation that have so far allowed for the reservoir refilling, notwithstanding the environmental problems associated with emptying the reservoir, it will inevitably lead to a serious shortage problem in Barlavento in the next dry year(s). Furthermore, in such occasion the other sources will experience quality and quantity difficulties.

³ “*Estudo dos Recursos Hídricos Subterrâneos e Impactes Hidrogeológicos*”, Prof. João J. Lopo Mendonça (Set.1997)

It is true that Funcho dam belongs to the Agricultural sector, for which it was built (1990), immediately upstream of the Arade dam (built in 1956), in order to augment the regularisation capacity of this dam. However, with the revised smaller capacity of Odelouca dam, little room remains for agricultural increases.

In table 2 a balance is presented, in which 20 hm³ will have to be reserved in the future in detriment of Agricultural uses, from Funcho dam, or from the aquifers, or both, to fulfil water supply.

Table 2 – Distribution of guaranteed available resources for water uses, at the project horizon (2025) ⁴

Source	Public consumption		Irrigation	
	Used Volume (hm ³)	Guarantee (%)	Used Volume (hm ³)	Guarantee (%)
Bravura reservoir	5	95	5	90
Querença-Silves aquifer	0	-	47	85
Funcho-Arade reservoirs	0	-	36	90
Odelouca reservoir	50	95	0	-
Reallocation of water volumes	+20	-	-20	-
Total	75	95	68	90

Considering the above, and having sought all the best available knowledge and techniques to study the supply possibilities, the Portuguese authorities concluded that there are no technically feasible alternative solutions to Odelouca dam, which will serve for the sole purpose of public consumption.

4. Environmental measures

The environmental management system of the Odelouca Scheme (SGAEO) has as purpose to guarantee the preservation and the enhancement of the environmental values in the area of the scheme and in the surrounding area, adopting appropriate practices and measures, coherent with the conclusions and recommendations of the studies and environmental processes carried through in the scope of the projects of the hydraulic scheme, with observance of the national and community legislative and regulatory requirements, providing itself with an adequate functional structure responsible for the execution of its comprised actions.

One of its purposes is the execution of the Program of Environmental Monitoring, consubstantiated in the continuous update of the environmental survey, in the planning and execution of the mitigation and compensatory measures of environmental impact consigned in the EIS and determined by the EIA process⁵;

The Environmental Monitoring Plan (PVA) of the Odelouca/ Funcho scheme fits the activity of the environmental politics of the SGAEO to the several levels of thematic and temporal intervention, associated, in priority, with the mitigating and compensatory measures of environmental impacts, with the control of the environmental quality, with the enhancement of the environmental values and with the training of the environmental stakeholders, in the several phases of the life of the scheme.

The PVA presents a simple and objective structure shaped by Programs of Measures, being these, in turn, structured in schematic Tables. The Tables synthetically present all the environmental measures foreseen by the EIA and the Report of the Commission of Evaluation, to the level of the mitigation, compensation and monitoring of the foreseen impacts.

⁴ In this table presented values are associated to different guarantee levels, so the additions have only a near value.

⁵ - Processo de AIA nº 536. Parecer da Comissão de Avaliação. Barragem de Odelouca e Túnel de Interligação Odelouca/Funcho (Estudo Prévio- Reformulação), 1998

Thus, with the purpose to guarantee the conservation of the wild flora and the fauna and of their natural habitat, measures have been adopted and are being implemented that are necessary to keep or to adapt the population of the wild flora and fauna in a level that corresponds, namely, to the ecological, scientific and cultural requirements, considering simultaneously both the economic and recreational requirements and the needs of the subspecies, varieties or forms threatened in the local plan, special attention being dedicated to vulnerable and threatened species, particularly if they are endemic.

The tables presented in the annex respect to the environmental measures foreseen in the PVA, having in consideration some of the species of higher conservationist value affected by the construction of the scheme - namely the Iberian Lynx (*Lynx pardina*), the Eagle of Bonelli (*Hieraaetus fasciatus*), the Escalo of the Arade (*Leuciscus aradensis*) and the Otter (*Lutra lutra*) - being these foreseen in the Convention on the Wild Life and Natural Habitats in Europe (Convention of Bern) and Habitats Directive (Decree n° 140/99, of 24 of April).

5. Odelouca Dam within the context of Lynx conservation ⁶

5.1. Lynx Conservation Action Plan

In order to revert the catastrophic situation of Iberian lynx populations a Conservation Action Plan was developed, providing a consistent and effective approach to conserve the species in Portuguese territory.

The Plan was prepared within Institute for Nature Conservation (ICN) context, and in June 2003 was evaluated by a scientific committee. Final version was finish in September and presently the Plan is being analysed by the Secretary of State staff.

Presently, the Iberian lynx is critically endangered in a pre-extinction stage and only the application of effective conservation measures can prevent its disappearance. In the global context of the factors that may affect lynx survival, the lack of official documents that regalement the species conservation could allow the increases of the effects of regression factors and delay the conservation decision making process.

This document, which is supported by the resolution n.º 152/2001, of October 11th, of the Ministries Council, was developed in order to be used as a tool for organization the recovery process of the Iberian lynx.

This Plan presents objective conservation actions for recovering the lynx, in a 5-years time frame, in areas such as species protection, habitat protection and recovery and increasing of lynx main prey, the European wild rabbit and ex-situ conservation measures. Therefore is crucial the collaboration with the Spanish Government, suitable funding, sustainable legislation, applied research and public awareness.

The main goal of the Plan is to **conduct preparatory actions of reintroduction and population reinforcement in order to contribute, in long-term, to recovery Iberian lynx Portuguese populations, and to assure their viability."**

5.2. Monitoring actions within the influence areas of Odelouca

Annually, several monitoring actions are applied in the historical lynx nuclei in Portugal, which include the Odelouca area. The lynx presence validation methods include identification of faecal DNA and camera-trapping. Within the Odelouca dam area, although significant surveying effort was conducted, no reliable lynx proofs were obtained.

5.3. Compensation measures

Since Odelouca dam is located in the eastern limit of Monchique lynx theoretical population and in the proximity of Caldeirão theoretical population, a barrier effect of the infrastructure on the lynx dispersion could be assumed. Considering that the neighbouring areas are completely covered with dense vegetation, and using the definition of Palomares et al (1999) it is quite admissible to conclude that the dam will not be a impenetrable barriers for lynx flow between Monchique and Caldeirão. In

⁶ Text prepared by the Institute for Nature Conservation (ICN)

fact, the major limiting factor for Iberian lynx existence and reproduction in this geographic area is rabbit density, which above the predator ecological needs.

So, compensation measures should be mainly focus on the augment of trophic resources for lynx. This could be achieved by the following measures, foreseen in the SGAE0:

1. Construction of several rabbit reproduction centres, with a productivity of 1000 to 1500 animals/years;
2. Construction of a significant number of reintroduction enclosure areas;
3. Habitat improvement with the implementation of cropland areas and artificial shelters;
4. Conduction of a large-scale, long-term rabbit reintroduction plan.

5.4. Measures for recovering the vegetation from forest fires

In the Monchique Natura 2000 network area, 22.700 hectares (54%) were burned during forest fires, in the summer of 2003. A significant reduction of lynx potential covered habitat was destroyed (approximately 15.000 hectares of Mediterranean scrubland). The recovery of this area, by spontaneous vegetation will, probably, not be problematic since Mediterranean vegetation presents good recovery rates after fire. The main problem could be the increase of rabbit density and so the measures referred in 5.3. will be conducted.