

THE ALQUEVA PROJECT: A REVIEW OF THE EVALUATION PROCESS

Gonçalo Lobo*, Nuno Videira*, Paula Antunes*, Rui Santos*, Ângela Guimarães Pereira**

* *ECOMAN Centre, Universidade Nova de Lisboa*

** *Institute for the Protection and the Security of the Citizen, EC - Joint Research Centre*

Abstract

This paper presents a critical review of the Alqueva project evaluation process. This review was conducted, within the context of the ADVISOR¹ - *Integrated Evaluation for Sustainable River Basin Governance* - project, following ADVISOR's conceptual analytic framework, i.e. addressing four dimensions of the evaluation: *Context, Assessment, Information and Participation*. One of the main conclusions from the Alqueva project review is that the socio-economic and political context dominated the decision-making process. The hypothetical social benefits (e.g. regional development) of the project were the main arguments to proceed with it, despite the fact that economic benefits (irrigation, energy and water supply) are not clearly demonstrated, whereas environmental impacts are very significant due to the submersion of a very large area. It is thought that the review of the Alqueva project, according to the vertices of the methodological tetrahedron of the ADVISOR project, has unveiled crucial aspects for the understanding of the evaluation process of a project of outmost importance in Portugal.

1. Introduction

Alqueva is a multipurpose project that aims at a social and economic development of the Alentejo region in the south of Portugal, by means of setting up a strategic water reserve and providing a guarantee of water supply for irrigation (110000 ha), population and industry (EDIA, 2002). The Alqueva Dam is the main infrastructure of the project, located on the river Guadiana. Alqueva will result in the largest artificial lake in Europe (250 km²) with a total capacity of 4150 hm³ and a full storage level at 152 m (EDIA, 2002). The project also includes a hydroelectric plant, the Pedrogão Dam, an adducting system for water supply and an irrigation system (EDIA, 2002).

The Alqueva project has very significant negative environmental and social impacts, mostly due to the submersion of a very large area that includes: important ecological values and habitats; local villages such as Luz (totally) and Estrela (partially) as well as, an important paper industry plant (Portucel Recicla). Other important impacts are related to the Guadiana estuary and the quality of water for irrigation.

The evaluation and decision-making process of the project was very long and complex, given the project's policy relevance at national and international scale, the debate that it has fuelled throughout the past 40 years and the strategic importance of its water functions. A critical review of the evaluation process of the Alqueva project was conducted, within the context of the ADVISOR (Integrated Evaluation for Sustainable River Basin Governance) project. This task was performed based on an extensive review of the relevant literature sources about the project, complemented with interviews with key actors², in order to account for the

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² Those are frequently called social actors, as well as stakeholders (North American school) and also in Dutch and German literature, the *betroffenen* (those concerned). Although through this paper, the word actors is used and while waiting for a better name, by *actors* it is meant here, those that may affect or are affected by a "problematique", and this includes not only those that have a stake or interest, those that play a role but also those that are concerned or affected by a situation. (Corral Quintana et. al, 2002)

knowledge and perspectives of actors and groups of interest that have been directly involved in the process. The analysis followed ADVISOR's conceptual framework, addressing four dimensions of the evaluation: *Context, Assessment, Information* and *Participation*. This analysis was performed in order to develop an understanding of how these four dimensions were handled during the Alqueva project evaluation process and their relevance for decision-making.

2. Review of the evaluation process

2.1 Context

The socio-economic and political context of the Alqueva project played a decisive role in the decision making process.

The project was conceived in 1957 as part of the *Alentejo Irrigation Plan*. At the time, Alqueva's main objective was the economic development of the region based on the agricultural sector. Since then, Alqueva has been strongly supported by the Alentejo population, local authorities and all the main political forces of the country. The project was approved in 1975, following the 1968 Portuguese-Spanish Agreement on international rivers. However, two years later the works stopped due to a negative statement from the World Bank concerning the high water costs estimated for irrigation.

During the 80's the project experienced several advances and retreats, following several political and institutional changes. In 1986 Portugal and Spain became members of the European Union (EU) and the financial support of the project by the European Commission (EC) became a central issue in the process and a very important factor to the decision of proceeding with it. This fact is demonstrated in 1990 when the government announces that the Alqueva project will proceed only if the EC could provide financial support. The EC Regional Development Office subsequently decided to promote a Global Assessment Study of the project, in order to set the basis for a decision of proceeding or not with Alqueva. The EC agreed to co-finance the project only if it could be clearly demonstrated that it would play a key role in the regional development of Alentejo.

The Global Assessment Study was concluded in 1992 and one year later the Portuguese Government decided to resume the project. The construction works in Alqueva have restarted in 1995, after the approval of the Integrated Environmental Impact Study (IEIS) of the Alqueva project and the creation of the *Empresa de Desenvolvimento e Infra-estruturas do Alqueva* (EDIA³).

In 1996 the Government elected in 1995 decides to proceed with the project with or without EC financial support, which eventually was approved through the Community Supporting Framework and Cohesion Funds. The EC supports about 50% of the financial costs, however, currently, financial support will only be available until the end of 2006, which can jeopardise the economic viability of the project (Vergés, 2000).

³ EDIA is a public company in which the State is the sole shareholder; created by the Portuguese Government in February 11th (Decree-Law n.º 32/95) to operate the Alqueva project. EDIA is responsible for the construction work and also for the global environmental management of the project, especially the implementation of minimization and compensation measures.

In 1998 another Agreement between Portugal and Spain was negotiated in Albufeira concerning the international rivers of Minho, Douro, Tejo and Guadiana. Similarly to 1968, this Agreement contemplated the implementation of the Alqueva dam and became a strong support for the decision to proceed with the project. This agreement contemplated a partition of flows for the international rivers. It was a priority for Portugal to guarantee water to fill up the Alqueva reservoir in Guadiana. Spain has agreed to guarantee more water to satisfy the needs of the Alqueva project, however, it was also agreed that the minimum flow for the Douro river should be diminished. Vergés (2002) criticised this agreement, pointing out that a “virtual transfer” of water was negotiated, from the north (Douro river basin) to the south (Guadiana river basin) of Portugal.

The Alqueva project was also included in the Guadiana River Basin Plan approved in December 2001. Alqueva is a key project in the Plan and represents 67,8% of the total investments, approximately 1250 million euro (MAOT, 2000).

Finally, on February 8th, 2002, the first Alqueva Dam gates were closed and the reservoir started to fill up.

2.2. Assessment

The Environmental Impact Assessment (EIA) of the project was a very long process. A first Environmental Impact Study (EIS) was concluded in 1987 (before the Portuguese EIA law), including only the Alqueva Dam infrastructure.

As mentioned above, in 1991, the EC (Regional Development Office) decided to promote a Global Assessment Study of the Alqueva project. This study was elaborated in 1992 by a Luso-Belgium consortium (Hidrotécnica Portuguesa, Tractebel and SEIA). Twenty-four different alternatives were evaluated:

- four alternative irrigation areas (200 000, 175 000, 140 000 and 110 000 ha);
- three different hydroelectric variants;
- and finally the possibility of including a smaller reservoir in the most southern section of the Guadiana river, to provide urban supply to the Algarve region and Spain.

The Global Assessment Study was not a typical EIS. The study had a very strong economic and financial emphasis, and the analysis was focused on the economic viability of the project. However, the study tried to integrate the environmental and social dimensions of the problem into a Multi-Criteria analysis. The alternative selected from this analysis was the construction of the Alqueva dam at a full storage level of 152 meters, aimed at the irrigation of 140 thousand hectares. The construction of a small reservoir to provide urban water supply to the Algarve region and Spain was also suggested. The hydroelectric power option was excluded by the study, although it did not reject its future viability. This study was crucial to support the 1993 Government’s decision to proceed with the Alqueva project. However, the construction works could only start after a formal Environmental Impact Assessment (EIA) process, as foreseen in the European (council directive 85/337/EEC) and Portuguese legislation (Decree-Law no 186/90).

The Installing Commission of the Alqueva Company decided to submit the First EIS (1987), which only included the Alqueva Dam and Hydroelectric Plant, to a formal EIA process. This EIS was presented to the Environmental Ministry in 12 May 1994. The evaluation committee

reported favourably, but the final decision was dependent on a global environmental evaluation of the project (IPAMB, 1994). The works could only start after a new EIS was done inclusive of a global analysis of the project.

Following the suggestions of the committee, an Integrated Environmental Impact Study (IEIS) was elaborated by SEIA and promoted by the EC - DG REGIO. The IEIS was concluded in 1995 and included all the other main hydraulic infrastructures of the project and the irrigation area. When the IEIS started the governmental decision to implement the Alqueva project was already taken and there was little margin to evaluate new alternatives. The study did not suggest any major project modifications, and the emphasis was put on the implementation of compensation and mitigation measures to minimise the impacts.

The main argument to approve the project was the regional development of Alentejo. This fact was also a crucial issue for the EC that would only co-finance Alqueva if this assumption could be proved. The Evaluation Committee recognised the importance of the environmental and social negative impacts of Alqueva and put a strong emphasis to the mitigation and compensation measures that should be adopted by EDIA (IPAMB, 1995). To monitor EDIA's actions the Evaluation Committee also proposed the creation of an Environmental Accompanying Commission for the project (CAIA).

Following the Evaluation Committee statement, EDIA has elaborated in 1997 an Environmental Management Program for the Alqueva project, which is at present the key instrument for environmental intervention. The main objective of the Environmental Management Program is to make a decisive contribution to the correct implementation of the project, promoting an environmentally sustained development of the Alentejo region (EDIA, 1997). The Program's major guidelines consist of:

- improving the knowledge and monitoring the relevant parameters for characterising the quality of the environment;
- minimising and/or compensating for its significant and irreversible negative impacts;
- encouraging the conservation of environmentally sensitive zones and the adequate management of water resources, as well as stimulating environmental opportunities.

Recently, other local and regional planning instruments were elaborated for the Alqueva area, such as the Alqueva Evolving Area Regional Plan (PROZEA) and the Alqueva and Pedrogão Dams Plan (POAAP). The PROZEA and POAAP are basically territorial planning instruments that tried to define rules for the land-use in the Alqueva area. The plans tried to avoid massive urban construction in the area and do not allow building in the numerous islands that will emerge by the filling up of the Alqueva reservoir (Tecninvest & FBO, 2001; Chiron & FBO, 2001).

EDIA also prepared in 2000 a Logging Plan for the Alqueva reservoir in accordance with the recommendations of the IEIS with CAIA's approval. The main reason for the logging operation is the preservation of the water quality of the future dam. The logging was made until the level 139 m and will proceed until level 152 m in a second phase.

2.3. Information

The EIS concluded in 1987 was crucial for the disclosure of information because it represented the truly first step towards a systematic environmental data collection about the Alqueva region. This study had a strong focus on the monitoring of the most relevant environmental parameters (DRENA & EGF, 1987). However, the scope of the study was restricted to the Alqueva dam. The Pedrogão dam area, and mainly the irrigation areas and the Guadiana estuary (and adjacent coastal zone) were less investigated.

The Global Assessment Study (1992) and the IEIS (1995) tried to collect additional and more recent data about the Alqueva dam area, as well as the remaining areas. However, the fieldwork was done in a very short period (3 months) and because of that, most of the data collected do not have a significant temporal component.

The quality of the information and the uncertainties in the IEIS were not accounted for in the process. There were uncertainties in some variables that are explained in the study (e.g. quality of water for irrigation), however, these were not considered to be an obstacle to the decision-making process.

2.4. Participation

The participation process followed the traditional procedure, according to the EIA legislation, with a period of 30 days of public discussion after the conclusion of the study.

The formal participation process had two different phases. In the first phase the public discussion was related only to the Alqueva Dam infrastructure and the Hydroelectric Plant. As referred above, the Installing Commission of the Alqueva Company decided to submit the First EIS (1987) to a formal EIA process. The public discussion process was opened in 1994 from June 27 to August 5. During this period there was a public hearing in Alqueva (July 23 1994) promoted by EDIA and with the presence of the technical coordinators of the 1987 and 1992 studies (IPAMB, 1994). The main critics were related to the fact that the irrigation plan was not being evaluated in the process (IPAMB, 1994). EDIA argued that they planned to submit the irrigation plan to a formal EIA process in a later stage in the process (IPAMB, 1994). The second phase of the formal participation process was promoted through the IEIS allowing for two public hearings in *Évora* and *Beja* (IPAMB, 1995). Several statements were received during this discussion period. The most discussed issues during the public participation process were, the irrigation plan, aspects related with the scope of the project and its relevance, impacts on fauna, water quality impacts, determination of the ecological flows and socio-economic impacts (IPAMB, 1995).

The public participation process had a marginal influence in the decision to approve the project, yet, participation did have an important role after the approval of the project, since it lead to the implementation of mitigation and monitoring programs. Furthermore, CAIA, created in 1997, followed very closely EDIA's global environmental management for the Alqueva Infrastructures. In CAIA there are representatives from national, regional and local authorities, environmental NGO's and agriculture organizations.

The members of CAIA have monthly meetings for discussing the main issues concerning the construction works and the environmental management of the project. An in-depth analysis of CAIA's meetings reports was conducted (1997-2001 period).

CAIA's first action was the approval of EDIA's Environmental Management Program. One of CAIA's main areas of intervention is the accompanying of the Preliminary Impact Assessment Studies for the Irrigation Areas. Several complementary environmental studies were elaborated following CAIA's suggestions, such as a study about the impacts in the Guadiana estuary that is being elaborated by LNEC (Portugal) and CEDEX (Spain), as well as a study about the water transfer to the Sado basin suggested in the irrigation plan.

In the last two years the preparation and implementation of the logging plan was a central issue in CAIA's discussions. This debate gave an extra importance to the problem of the exploration of the Alqueva Dam. The Environmental NGO's claim that it is still possible to avoid many negative impacts by operating the dam at a level of 139 m, instead of the proposed 152 m, recommending that the logging should stop at the lower level. Other polemic moments in CAIA was the discovery by the end of 2001, of pre-historic engravings inside the area to be submerged, which rose the public and media attentions. The social impacts were also discussed in CAIA (focusing in Aldeia da Luz), yet the emphasis given to the environmental impacts was much greater.

3. Lessons learned from Alqueva

Learning from ex-post cases in order to promote truly integrated evaluations of river basin projects in the future, is one of ADVISOR's key premises. The examination of the Alqueva project, according to the analytic framework provided by ADVISOR, allowed for the systematic reconstruction of its evaluation process. By mapping the project's timelines (with respect to the context, assessment, information and participation) it was possible to identify some of the leverage factors underlying the decisions made in Alqueva.

Thus, one of the main conclusions from the review is that the socio-economic and political context dominated the decision-making process. Local communities and all major political forces (national, regional and local) of the country have seen Alqueva as the *solution* to attain regional development in Alentejo. The project had a large national consensus, being the Environmental NGO's the only ones clearly against it. The hypothetical social benefits (e.g. regional development) of the project were the main arguments to proceed with it, despite the fact that economic benefits (irrigation, energy and water supply) are not clearly demonstrated and the environmental impacts are very significant due to the submersion of a very large area. The decision of the EU to co-finance Alqueva, due to the regional development perspective, was also a very important step to resume the project and start the construction work in 1995.

When the formal environmental impact assessment process started in 1994, the decision to proceed with Alqueva had already been taken. This fact shifted the focus of the assessment to the importance of a global environmental management of the project. The IEIS did not suggest any major project modifications, and the emphasis was put on the implementation of compensation and mitigation measures that should be included in a global management program.

The quality of the information and uncertainties in the IEIS were not accounted for in the process. Although there were uncertainties in some key variables (e.g. quality of water for irrigation), these were not considered to be an obstacle for the decision-making process.

The participation process followed the legally binding procedures, with a period of 30 days of public discussion after the study was finished, with barely no impact on the development options of the project. However, participation did have an important role after the approval of the project, during the implementation of the mitigation and monitoring programs. This was possible by the creation and effective implementation of CAIA.

As it was described, the decision making process of the Alqueva project was very long and complex and the authors of this paper wonder whether the initial objectives of the project are still valid. The project was conceived mainly with the objective of developing the region through the promotion of the Agricultural sector based on intensive irrigation; however, nowadays the key objective is the Regional Development of Alentejo that in the opinion of the local authorities can be achieved also through the promotion of Tourism in the region. The question remains on whether a project like Alqueva with a huge financial investment and significant environmental and social impacts was the most desirable option to promote the Regional Development of Alentejo.

The review of the Alqueva project evaluation process, according to the vertices of the methodological tetrahedron of ADVISOR, has unveiled crucial aspects for the understanding of the inherent governance issues of a project of utmost importance in Portugal.

4. References

Chiron, FBO (2001): *Plano de Ordenamento das Albufeiras de Alqueva e Pedrogão (POAAP) – Proposta de Plano, versão 2*, Instituto da Água.

Corral Quintana S., Funtowicz S., Giraud F., Guimarães Pereira Â., Logozzo R., Martinino R., Musone A., Petit V., Renda O., Rinaudo JD., Silva Blasques J. (2002): *Tools to Inform Debates Dialogues & Deliberations: Information Technology for New Governance on Water Issues*. III congresso Iberico sobre Gestión y Planificación del Agua. November 2002.

DRENA, EGF (1987): *Estudo de Impacte Ambiental do Empreendimento do Alqueva*.

EDIA (1997): *Programa de Gestão Ambiental do Empreendimento de Fins Múltiplos de Alqueva*.

Hidrotécnica Portuguesa, Tractebel, SEIA (1992): *Empreendimento de Fins Múltiplos de Alqueva. Estudo de Avaliação Global. Síntese*.

IPAMB (1994): *Relatório da Consulta do Público do Estudo de Impacte Ambiental Aproveitamento Hidráulico do Alqueva*.

IPAMB (1995): *Relatório da Consulta do Público do Estudo Integrado de Impacte Ambiental do Empreendimento de Alqueva*.

MAOT (2000): *Nota relativa à aprovação dos Planos de Bacia Hidrográfica dos Rios Internacionais, Minho, Douro, Tejo e Guadiana*.

SEIA (1995): *Estudo Integrado de Impacte Ambiental do Empreendimento de Alqueva*.

Tecinvest, FBO (2001): *Plano Regional de Ordenamento do Território da Zona Envolvente de Alqueva (PROZEA) – Proposta de Plano*, Direcção Regional do Ambiente e Ordenamento do Território do Alentejo (DRAOT Alentejo).

Vergés, J.C. (2000): *El saqueo del agua en España, 5. La cria del elefante blanco europeo en el Guadiana*, pag 137-155, Ediciones de la Tempestad, SL, Barcelona.

EDIA (2002): *EDIA's website*, <http://www.edia.pt>.