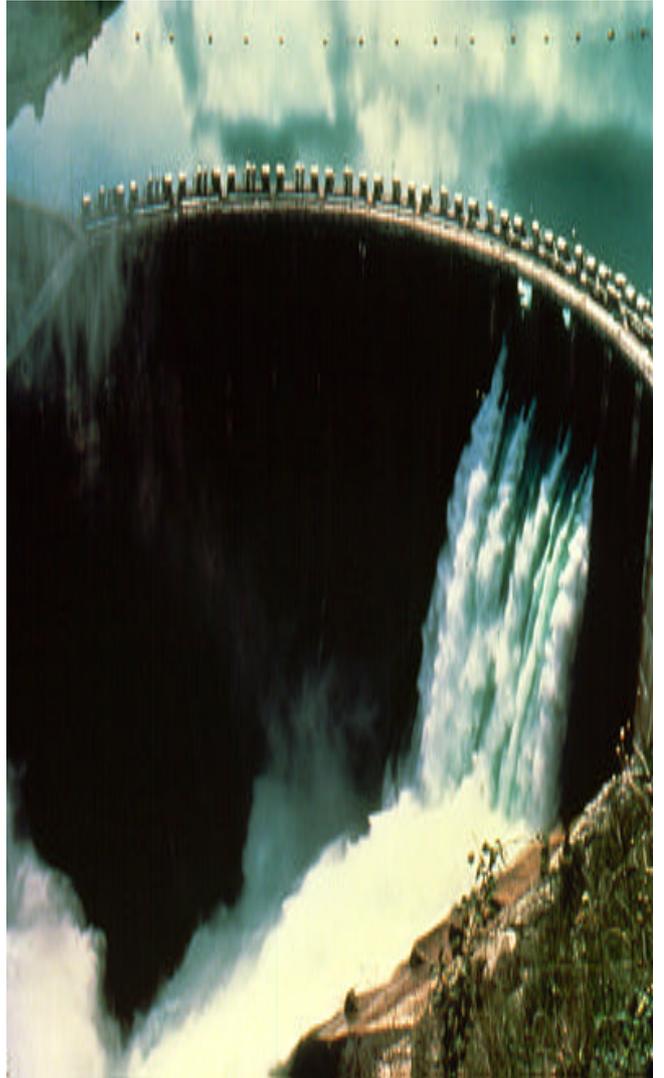




Ermenek Dam & Hydropower Project

*WWF-Turkey
Research and Evaluation Report*



Ermenek Dam & Hydropower Project
Evaluation of Ecological Issues 2003
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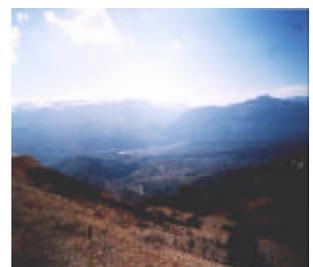
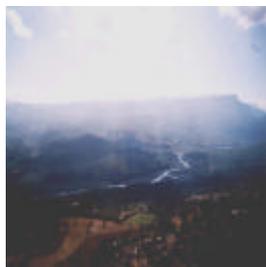
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Ermenek Dam & Hydropower Project Evaluation of Ecological Issues

Summary

The Ermenek dam and hydropower project is one of seven hydropower plants, dams, and diversions planned or constructed in the Göksu River basin in southeastern Turkey. The Göksu River is one of the last free flowing rivers in Turkey and an important site for both migratory birds and plant diversity. A large portion of its delta is protected under national laws and by international listing as a Ramsar site. The Ermenek project has been approved and is currently under construction, with financing from a consortium of private European banks. These banks are not bound by the environmental and social safeguards, and decision transparency, mandated of intergovernmental financial institutions such as the World Bank Group. Such safeguards were developed by specialists, and adopted by the governing boards, in response to massive public pressure following disastrous consequences of high-profile projects funded by these organizations.

Without similar safeguard policies, private banks make lending decisions often without due consideration of environmental and social consequences, thereby allowing the development of projects that could also result in major adverse effects. This is the situation with the Ermenek project as currently instigated, where shortcomings in dam planning, economic analysis, environmental impact review, and decision-making, are causing significant negative environmental consequences that could have been avoided or at least diminished:

- ?? Master plans for the Göksu basin were completed many years ago, prior to general recognition of the extensive environmental values of the region. These were not comprehensive. The feasibility study was completed in 1990.
- ?? The Environmental Impact Assessment (EIA) for the Ermenek dam was completed in 1999, long after the feasibility study, rather than in the early planning stages. Hence findings of the EIA, such as measures to mitigate significant adverse impacts, could not be incorporated into the project design. Another noteworthy shortcoming of the EIA is its failure to take a basin-wide approach, thereby not taking into account cumulative impacts of the various Göksu basin projects.
- ?? No comprehensive needs and options assessment has been carried out for the Ermenek Dam. Other more decentralised alternatives and renewable resources, which can also lower transmission losses (up to 30% in Turkey) and which can minimise impact to the Göksu basin ecosystem, are not considered to be alternatives.
- ?? The economic analysis failed to take into account various aspects such as cost of new transmission lines, losses to fisheries and other resources associated with diminished flood regimes, loss of cultural heritage values, and future decommissioning costs.
- ?? Ecological surveys were insufficient for such a large project, and little consideration was given to the suitability, security, and future management arrangements of alternative habitats for important flora and fauna.
- ?? The mitigation of environmental impacts is not covered comprehensively. The project fails to meet requirements to explicitly consider and provide compensatory alternatives to ensure a net gain for protected species. For instance proposed downstream flow of 4.1 cubic meters per second is clearly inadequate to maintain downstream ecological conditions.
- ?? The project does not comply with major recommendations of the World Commission on Dams (WCD), in that there is:
 - a lack of public participation, hence poor understanding by potentially affected stakeholders
 - a lack of comprehensive assessment of alternatives that would largely achieve the same project objective
 - no analysis of ongoing impact of existing dams, and other proposed projects
 - no analysis of basin-wide impacts
 - no comprehensive environmental management plan
 - no agreed independent and transparent means of ensuring compliance with environmental mitigation measures
 - no performance bond set-up to fund reparations should the project result in unforeseen problems.

WWF recommends that lenders should suspend construction financing until the following improvements are undertaken:

- ?? EIA Report of Ermenek Dam and HEPP is revised with particular attention at cost-benefit analysis and needs and options assessment sections. Basin wide cumulative and indirect impacts of the project are studied and incorporated into the EIA considering the fact that Ermenek Dam and HEPP is a part of a bigger scheme of hydropower and irrigation projects in the Göksu Basin.
- ?? a comprehensive basin-wide master plan is prepared, in close consultation with affected stakeholders
- ?? a strategic environmental impact assessment is made in conjunction with the basin-wide master plan
- ?? an environmental management plan is developed for the basin master plan in general and the Ermenek project in particular, including specific commitments and accountability
- ?? projects in the Göksu basin are subject to a rigorous evaluation against findings of the World Commission on Dams
- ?? relevant agencies of the Turkish government commit to implementing findings of the World Commission on Dams for all current and future dam projects in the country

WWF seeks to work with the Turkish Government, financing institutions, and local communities to address shortcomings of the Ermenek project and reduce the environmental impacts of large dams.

Figure 1 Göksu River Mouth and Delta



Background

The Ermenek hydropower project, currently under construction, is located on the Ermenek River, a tributary of the Göksu River in the province of Karaman, South Eastern Turkey. The Göksu River is one of the last free flowing rivers in Turkey. The main tributary of the Göksu River rises near Hadim, and after flowing south, it joins with the Ermenek River. Following this, the river flows toward the southeast and is joined by the Hocasait from the south and the Kurtsuyu from the north, passes through Silifke plain and finally flows into the Mediterranean Sea forming the Göksu Delta.

The Göksu Delta is an important bird, plant and sea turtle nesting area formed by ongoing sedimentation. The Delta includes a freshwater lake, a lagoon, a number of smaller shallow seasonal lakes, and several thousands of hectares of saltmarsh. Most of the delta is now intensively used for irrigated and non-irrigated agriculture and settlements. (Wetlands International 2002)

The Göksu Delta has been recognised as a Wetland of International Importance under the Ramsar Convention and is also listed as a Specially Protected Area, Permanent Wildlife Reserve and SIT, which means that it is protected under the Law on Protection of Cultural and Natural Assets (Wetlands International 2002). This nominally makes the Göksu Delta one of the best-protected sites in Turkey. However, current and planned dams threatened the integrity of this important ecosystem.

Development Plans on Göksu River

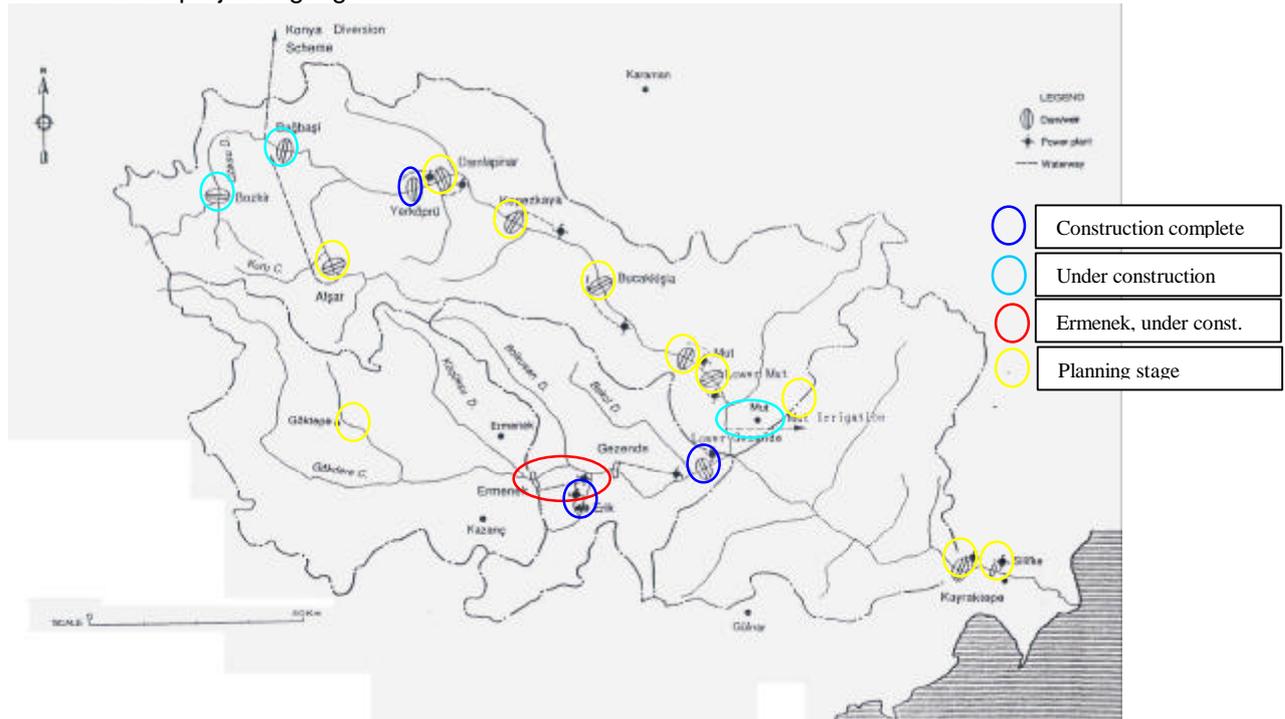
Currently Gezende Dam and hydroelectric power plant and the Yerköprü hydroelectric power plant are operational in the Göksu catchment.

The Gezende Dam and power plant were completed in 1990 and are located 20km downstream from the Ermenek project. Gezende has a capacity of 159MW or 528 GWh annual generation. Construction of the Gezende Dam has significantly reduced sediment flows downstream and may have had serious impacts on aquatic species although little baseline or follow-up monitoring has been carried out.

Yerköprü hydroelectric power plant is located on the Göksu River and has a capacity of 10.56 MW and an annual generation of 70 GWh.

WWF is aware of plans for a number of additional hydropower plants, dams and a river diversion scheme on the Göksu and its tributaries. However, despite the protected status of the delta, there has been no comprehensive planning study or environmental impact assessment covering the whole Göksu Basin. Partial plans include the master plans of General Directorate State Hydraulic Works (DSI) and General Directorate of Electric Power Resources Survey and Development Administration. However, those plans do not take environmental and social impacts into account through strategic EIA and many of these partial plans were written prior to recognition of the environmental values of the Göksu Delta.

Figure 2 Göksu Basin and General Plan of Göksu River Hydroelectric Power Development Scheme, with Ermenek project highlighted



Ermenek Project

The Ermenek Project is designed for power generation, with two components; Ermenek Dam and hydroelectric power plant and Erik Diversion and hydroelectric power plant. The feasibility study for the project was completed in 1990, while the EIA report was not published until 1999. The final funding agreement for the project was signed in February 2002.

The Ermenek Dam and hydroelectric power plant comprises a double-curvature asymmetrical thin concrete arch dam body, situated at a narrow and deep canyon, and an 8064m long pressure tunnel connecting to a surface powerhouse with 302.4MW installed capacity. The Erik Diversion and hydroelectric power plant is a structure leading through a 4150 m pressure tunnel to a run-of-river underground power cavern with 6.5 MW installed capacity. The Ermenek Reservoir will cover 61.45 square kilometers and hold 4.5 billion cubic metres of water.

The project is being built with 100% foreign financing by the Ermenek Consortium. The financing group includes ABN AMRO Bank, Bayerische Landesbank, Kreditanstalt fur Wiederaufbau and Société Générale as joint lead arrangers, Bayerische Landesbank as agent of the banks, Bank Austria Creditanstalt Group as Co-Arranger and OeKB as facility agent. (Turkish Australian Online Business)

The financing group agreed in early 2002 to provide 610 million euros (approx \$US 695 million) to support the contract signed between the General Directorate of State Hydraulic Works (DSI) and a consortium of ALSTOM Power Australia, BM Muhendislik, Alpine Mayreder Bau, VA Tech Hydro, Verbundplan and Voith Siemens Hydro Power Generation. The transaction is credit guaranteed by the Australian Export Credit Agency (Turkish Australian Online Business).

Economic arguments

Completion of the project will increase Turkey's hydropower capacity by 2.1% compared to 1998 levels and contribute approximately 0.95% to Turkey's total power output.

Preliminary calculations for JICA (Japan International Cooperation Agency) in 1990 indicated an internal return rate of 14.9% by 2060. This preliminary calculation did not include the cost of environmental impacts. The EIA included an environmental cost benefit analysis. It is interesting to note the internal return rate calculated in the EIA is still substantial at 12.45% in 2031 and 13.74% in 2060.

The cost analysis failed to take into account the following:

- ?? Possible delay in construction and associated cost overruns;
- ?? Future decommissioning impacts or costs;
- ?? Costs of new transmission lines associated with the project;
- ?? Loss of roads and cost of rebuilding;
- ?? Contribution to impact on whole river ecosystem (alteration of river dynamics, alteration of riverbanks);
- ?? Benefits or losses associated with recreation, fisheries or changes to the flooding regime;
- ?? Risks associated with displacement of people and indirect effects to local trade and livelihood;
- ?? Loss of the cultural heritage values associated with Görmel Bridge;
- ?? The risk that global climate change may cause severe droughts or floods that may affect turbine and total production performance

The EIA notes that the construction phase will provide significant work opportunities for approximately 900 people and that it is planned that local people from the towns of Ermenek and Gulnar will fill many of these jobs. Once construction is completed the number of jobs will be reduced dramatically to around 80 people.

The EIA assumes that the increase in jobs will increase local trading opportunities and that the production of hydropower will lead to direct benefits at the national scale. The EIA report repeatedly emphasises the potential positive impacts but fails to consider the possible negative impacts of an increase in trade, worker flow to the region or the indirect effects of relocation.

Environmental and social Impacts

Best practice, as embodied in the practices of organisations such as the World Commission on Dams, specify that impact assessments need to be timed so that results can feed into the final design of the project. Unfortunately the Environmental Impact Assessment (EIA) procedure for Ermenek started only after the planning of the project was almost complete leaving little opportunity for the project to be modified. Although some studies into feasibility and relocation requirements were carried out between 1988-1990, no project specific studies on flora or fauna were commissioned until the EIA commenced in 1999.

Basin Wide Impacts

The most significant shortcoming of the EIA is its failure to take a basin approach, therefore not taking cumulative impacts of the projects on the aquatic and terrestrial ecosystem into account. Ermenek Dam and hydroelectric power plant is part of a bigger scheme of hydropower projects and irrigation projects in the Göksu Basin and it cannot be separated from the whole picture.

The Göksu Delta Management Plan (1997) cautions that rapid coastal erosion and associated losses in dunes may occur if the dams planned on Göksu River and tributaries are built. The local economy (agriculture, fisheries, tourism) is dependent on ongoing sedimentation to maintain the delta. It is of great concern that the Ermenek EIA does not consider these impacts.

The EIA claims that because Gezende Dam and hydroelectric power plant have been in operation downstream since 1992, most of the environmental impacts will have occurred already. However, the EIA does not actually include any specific information on the impacts of the Gezende Dam and it fails to consider additional environmental impacts on the Göksu River and Delta such as scouring and erosion of river banks, changes in the sediment pattern, which potentially impacts the survival of the Göksu delta and fisheries.

Site Impacts

Dam reservoirs destroy ecosystems and the extent of this damage depends on the location and the size of the scheme. The Ermenek reservoir will cover approximately 60.75 square kilometers of which 70% is agricultural land and 30% forest.

The Ermenek Valley has been identified as an Important Plant Area and is notable for the high level of endemic species found only in that area. A total of 900 taxa have been recorded, of which 179 are Turkish endemics. Of over 100 nationally rare species recorded, no fewer than 50 are largely or wholly restricted to this area. (Özhatay et al 2003)

The botanical survey completed for the EIA does not reflect the true nature of the extremely rich flora of Ermenek Valley. The length of the survey was insufficient for such a large project, covering only the months of February-March-April in 1999. To identify the rare and threatened plant species, this survey should have been extended to May-June-July-August. Moreover, this survey should have been repeated the year after. Consequently, the EIA reports only 374 plant species including 23 endemic to Turkey. Furthermore, several threatened species from the two families (Amaryllidaceae and Illecebraceae) known to occur in the area are not listed in the EIA.

The construction of the dam and diversion tunnel could significantly impact aquatic biodiversity. The EIA states that 6 fish species: Brown Trout (*Salmo Trutta*), Bulatmai barbell (*Barbus capito*), Transcaucasian barb (*Capoeta capoeta*), Common Carp (*Cyprinus carpio*), European Chub (*Leuciscus cephalus*), and *Chondrostoma regium* will be impacted by the change from a river to a lake ecosystem. The report states that these species will adapt to lake conditions and that arrangements will be made to incorporate structural elements that allow fish movement. Some freshwater fish species use upper creeks for spawning. These areas will be limited and fish will use side tributaries instead of the main course, which is bypassed by the pressure tunnel. The impacts of reduction of habitat niches, physical prevention of fish migrations, isolation of populations, disruption of breeding triggers (particularly through changes in water quantity and velocity, water temperature, seasonality of flows) and the potential for fish disease in reservoirs cannot be considered trivial issues.

The EIA states that 4 amphibian species, 21 reptile species, 53 bird species and 34 mammal species are likely to be affected. Of these 49 bird, 21 reptile and 2 amphibian species are listed under the Bern Convention. In addition an endemic orchid species (*Ophrys argolica*) listed in Appendix I of the Bern Convention, grows in the dam area. Turkey is obligated under the Bern Convention to conserve its wild flora and fauna and their natural habitats and to pay particular attention to endangered species however there is no reference to this obligation and how it will be achieved in the EIA.

The underground pressure tunnel to transfer water from the reservoir to the hydroelectric power plant will result in the loss of approximately 8.5 km of river habitat. EIA does state that a minimum critical flow of 4.1 cubic metres per second will be provided for the survival of aquatic fauna and flora. However, this is unlikely to be sufficient as discussed below.

Large reservoirs such as the Ermenek Dam inevitably affect local climate and create new microclimates, and although the habitat on both sides of the reservoir is stated to be similar in the EIA, the lake will be a natural habitat barrier and reduce population size and connectivity. This is poorly dealt with in the EIA which deals with most potential impacts with the sweeping assurance that alternative areas or habitats are available. There is little consideration of the proportion of a species population and its habitat affected, the suitability, security and future management arrangements of the alternative habitat or the potential for migration of animals to alternative sites.

The recreation areas to be created are promoted as a positive impact, however artificial recreational areas cannot be easily compared with natural ones. For example there is no mention of the fact that Ermenek River has considerable potential for rafting and that this potential will be lost.

Another issue not well evaluated by the EIA is the solid waste dumping problem. It is stated that domestic solid wastes created during the construction and operation of the dam will be disposed in the Ermenek District dumping area above the reservoir and that leakage from the wastes will only flow into the reservoir from a distance. The fact that the dumping area where the solid wastes of the dam will be disposed of is not in compliance with the Turkish Solid Waste Control is not mentioned in the EIA.

Social impacts

The directly affected population is estimated as 550 people who need to be relocated. An April 2003 press clipping about Ermenek Dam states that people to be displaced from 12 villages in Karaman continue to protest, as they have not been provided with resettlement costs or information on the proposed resettlement location.

Additionally indirect effects and long-term consequences to local trade or livelihood are not evaluated sufficiently by the EIA.

Mitigation

The mitigation of environmental impacts is not covered comprehensively in the Ermenek EIA.

In discussion of the 6 fish species impacted, the EIA simply states that they expect these species will adapt to lake conditions and that arrangements will be made to incorporate structural elements that allow fish movement and reduce mortality through turbines. There is no detailed consideration of the impact of the reduction or lack of specific micro habitat's and the loss or modification of specific flow and temperature related triggers that may have important consequences for fish behavior including migration and spawning.

The minimum critical flow of 4.1 cubic metres per second proposed compares to very poorly to natural flow. Examining the flow statistics from the closest monitoring station (Görmel Bridge Station) the average annual flow of the river is 42.3 cubic metres per second. At the same station over the period 1982-1992 the maximum flow rate recorded is 354.11 cubic metres per second in November and minimum 7.55 cubic metres per second demonstrating the clear fluctuations in flow of the river between summer and winter. In the two driest months, August and September, the average flow rates are 9.39 and 8.68 cubic metres per second respectively.

If the two nearest flow-monitoring stations are considered together over the period 1946 to 1995 the minimum flow rate recorded is 3.86 cubic metres per second. Over this 50 year period natural flow has been below the nominated critical flow rate of 4.1 cubic metres per second only 6 times.

This means the critical flow rate is almost half of the average flow rate in the driest months and is set at the lowest historical flow levels. This is clearly inappropriate. A recent publication by IUCN (2003) has demonstrated the importance of adequate levels of flows and WWF urges that benchmarks for flow maintenance should be expressed as a proportion of flow to be maintained in terms of the natural climatic and seasonal variability of the region.

In general, the experience with mitigation measures has not been overly successful. The WCD (2000) evaluated 87 projects for which impacts had been recorded and found that mitigation had been carried out on less than 25% of the anticipated environmental impacts. Even worse where mitigation was carried out, it was effective in only 20% of the cases, while in a further 40% of the cases it had no beneficial impact. Therefore, it is questionable whether mitigation measures such as the inadequate minimum flow described above are likely to be effective in the Ermenek case. Certainly, evidence from elsewhere in Turkey is not encouraging. For example, the Eregli marshes, Sultan Marshes (a Ramsar Site) and a lot of similar wetlands have been lost or heavily impacted due to dams constructed upstream.

World Commission on Dams (WCD) Recommendations

The World Commission on Dams (WCD), in its report published in 2000, provided a new framework for decision-making on dams to ensure that water and energy needs are met in a sustainable fashion. There does not appear to have been any specific indication from the Turkish Government that they are committed to following WCD guidelines. In general, it is not easy to assess the project against the seven strategic priorities or the 26 specific recommendations of the WCD due to a lack of information on key issues. However, WWF has made an initial assessment against the seven strategic priorities based on the limited information available.

The informed participation of stakeholders on the basis of a comprehensive baseline dataset is the key to the implementation of WCD recommendations. In Turkey participatory ways of working are still rather new; the capacity for participatory work is quite varied across the country and within government bodies. Hence, EIA is usually not applied in an open, consensus-oriented or participatory way. Indeed, EIA is often perceived as the domain of 'experts' and is rarely, if ever, used as an entry point for involving local stakeholders, harnessing their knowledge and considering their particular needs during the feasibility and design phases of dam planning. The lack of public participation, poor baseline data available and difficulty in obtaining access to economic assessments mean that the Ermenek proposal fails to address the WCD strategic priorities.

Analysis of the Ermenek project against the seven strategic priorities recommended by the World Commission on Dams

WCD Strategic Priority	
Gaining Public Acceptance	<p>Public participation is still weak in Turkey, although it has improved in recent years. Reasons for weak public participation in the development of the Ermenek Project include limited time allowed for this purpose and insufficient information sharing.</p> <p>The directly affected population is estimated as 550 people who need to be relocated. An April 2003 press clipping about Ermenek Dam states that people to be displaced from 12 villages in Karaman continue to protest, as they have not been provided with resettlement costs or information on the proposed resettlement location. Additionally indirect effects and long-term consequences to local trade or livelihood are not evaluated sufficiently by the Environmental Impact Assessment or the cost benefit analysis.</p> <p>Transparency is key to public acceptance but in the Ermenek case, cost-benefit analysis details have been kept confidential and the EIA report was not provided directly to WWF Turkey due to a confidentiality agreement made between the company and DSI. Although it is theoretically possible for anyone to obtain a copy of the EIA by application to the DSI or Environment Ministry, the WWF experience was that several applications and visits to the Ministry and a direct personal approach to the Deputy Minister of Environment was required before a copy was received. It was not possible to obtain an English copy of the EIA.</p> <p>The lack of participatory process and poor availability of information mean that the informed consent of stakeholders cannot be assumed for the Ermenek project.</p>
Comprehensive Options Assessment	<p>According to the EIA the long-term benefit of the proposal is a modest increase in total Turkish electricity output of less than 1% and reduction of sedimentation in an existing hydropower plant.</p> <p>The WCD recommendations suggest that a comprehensive options assessment be based on a comprehensive and participatory assessment of the full range of policy, institutional, and technical options. In the assessment process, social and environmental aspects should be accorded the same significance as economic and financial factors.</p>

	<p>The feasibility study for the Ermenek project was completed in 1990 and EIA was not completed until 1999. This has inevitably restricted the validity of the options assessment.</p> <p>The alternatives suggested in the EIA include:</p> <ul style="list-style-type: none"> ?? A lignite fired thermal power plant ?? Two middle sized hydroelectric power plants instead of one big project ?? No project <p>Mini and micro hydro schemes, run-of-the-river schemes, more decentralized alternatives or other renewable resources, which can also lower transmission losses (up to 30% in Turkey), are not considered to be alternatives. These are rejected based on the assumption that they are more expensive but without providing evidence to support this.</p> <p>There has not yet been a funded commitment by the Turkish Government to explore the contribution that could be made by development of alternative energy generation capacity or demand management.</p> <p>Previous investigations into the Ilisu Dam noted the Turkish Government's own State Planning Organisation's 1996-2000 Five Year Development Plan, concludes that "energy efficiency is considered the cheapest energy source [and] potential gains to be achieved by increased energy efficiency are substantial."</p> <p>It is of serious concern that the assessment and valuation of the social and environmental impacts used to justify the preferred option do not include:</p> <ul style="list-style-type: none"> ?? Possible delay in construction and associated cost overruns ?? Future decommissioning impacts or costs ?? Costs of new transmission lines associated with this project ?? Loss of roads and cost of rebuilding ?? Contribution to impact on the whole river ecosystem (alteration of river dynamics, alteration of riverbanks) ?? Benefits or losses associated with recreation, fisheries or changes to the flooding regime ?? Risks associated with displacement of people and indirect effects to local trade and livelihood ?? Loss of cultural heritage associated with Görmel Bridge ?? The risk that climate change may cause severe droughts or floods that may affect turbine and total production performance <p>It is clear that a multi criteria analysis of regional needs and options has not been completed for the Ermenek Project or for other proposed projects in the Göksu Basin. This lack of analysis means it is unclear that Ermenek Dam and hydroelectric power plant are the most sustainable development options available.</p>
Addressing Existing Dams	<p>There is no analysis of the ongoing impact of the existing Gezende dam and hydroelectric power plant downstream or the effectiveness of any mitigation measure put in place. It is simply assumed that the existing impacts caused by Gezende dam cancel out any potential impacts of the Ermenek project.</p> <p>The WCD recommends that a comprehensive post project monitoring and evaluation process, and a system of longer-term periodic reviews of the performance, benefits and impacts for all</p>

	<p>existing large dams should be introduced. The effectiveness of existing environmental mitigation measures should be assessed and unanticipated impacts identified; opportunities for mitigation, restoration and enhancement recognized, identified and acted on.</p> <p>This should then provide important information for the planning and option development stage of other dams in the catchments.</p> <p>There was no reference to ongoing review and evaluation of Gezende dam in the EIA for the Ermenek project. The EIA itself found that Brown Trout (<i>Salmo trutta</i>) could not be found now although its presence in the past was listed in the literature. The EIA completely fails to relate this loss to the construction of Gezende Dam and hydroelectric power plant just downstream of the Ermenek Project 10 years ago.</p>
Sustaining Rivers and Livelihoods	<p>The Göksu River, a tributary of which is the site of the Ermenek project, is one of the last free flowing rivers in Turkey and an important site for both migratory birds and plant diversity. The lack of river basin scale planning means the Göksu River Basin and delta are threatened by at least five hydro plants, one dam and a river diversion scheme.</p> <p>The Göksu River as a relatively undeveloped river that is the lifeblood of an internationally important wetland system, the Göksu Delta, should have high priority for active management and protection. Unfortunately, Turkey does not have a national policy to maintain selected rivers with high ecosystem value.</p> <p>As noted before, the Ermenek Project has been evaluated without reference to the whole Göksu Basin. This is in direct conflict with the WCD recommendation that “A basin-wide understanding of the ecosystem’s functions, values and requirements, and how community livelihoods depend on and influence them, is required before decisions on development options are made.” (WCD 2000)</p> <p>The minimum critical flow of 4.1 cubic metres per second compares to very poorly to natural flow. This flow rate is almost half of the average flow rate in the driest months and is set at the lowest historical flow levels. This is clearly inappropriate. WWF urges that benchmarks for flow maintenance should be expressed as a proportion of flow to be maintained in terms of the natural climatic and seasonal variability of the region.</p> <p>At this stage, there is no agreed environmental management plan incorporating environmental flows and other mitigation and enhancement measures that has been agreed with stakeholders and defines monitoring and evaluation programs. There is little information provided to demonstrate that proposed mitigation and development measures would be effective in meeting their objectives. The Ermenek project also fails to meet requirements to explicitly consider and provide compensatory alternatives to ensure a net gain for protected species.</p>
Recognising Entitlements and Sharing Benefits	<p>The WCD recommends that impact assessment include all people in the upstream, downstream and in catchment areas whose properties, livelihoods and non-material resources are affected. There has been some work on resettlement plans for directly impacted households but these do not appear to be well documented and agreed.</p> <p>Assessment should also encompass people affected by dam related infrastructure such as transmission lines and resettlement developments – there does not appear to have been a process to</p>

	include these people in the assessment and negotiation of the Ermenek scheme.
Ensuring Compliance	<p>The WCD suggest that clear guidelines to ensure compliance should be adopted by sponsoring, contracting and financing institutions. Further they note that compliance must be subject to independent and transparent review and that the cost of establishing and implementing the guidelines are built into the project budget.</p> <p>It is unclear what funding or responsibility, if any, has been allocated for a monitoring and evaluation system covering project performance, safety and impacts.</p> <p>No reference to performance bonds or Trust Funds to fund reparations should the project result in unforeseen problems has been found. There is currently no body nominated for referral of adverse social and environmental impacts for reparation.</p>
Sharing Rivers for Peace, Development, and Security	Not applicable as the whole river is on Turkish territory.

WWF Conclusions and Recommendations

The Ermenek Dam and hydropower project has been evaluated as a case study of the shortcomings of the planning process for new dams and WWF is making recommendations to ensure that this project and all future proposals conform to the WCD guidelines and properly weigh up environmental, social and economic costs and benefits.

Turkey, through its listing of the Göksu Delta as a Ramsar site and designations under national laws has indicated the desire to protect the values of the area. To move from desire to real protection is an urgent priority with significant development planned and underway in the catchment. The EIA completed for the Ermenek project was substandard and should be significantly reconsidered.

Although the cost benefit studies show significant economic benefits for the Ermenek project, WWF is of the view that to conserve the special features of the Göksu, significant improvements are required both to the ongoing construction and future management of the Ermenek project; and to the process for assessment and approval of future proposals to ensure that all development conforms with the WCD Guidelines and properly weighs up environmental, social and economic costs and benefits.

WWF recommendations to improve environmental outcomes of the Ermenek project:

1. ABN and other financiers should suspend finance for construction until the following recommendations for improvement of the EIA are seriously considered and realized.
2. Basin wide cumulative and indirect impacts of the project are studied and incorporated into the EIA, considering the fact that Ermenek Dam and HEPP is a part of a bigger scheme of hydropower and irrigation projects in the Göksu Basin.
3. An agreed environmental management plan incorporating environmental flows and other mitigation and enhancement measures agreed with stakeholders and defining monitoring and evaluation programmes is urgently required. The project proponents should investigate and cost actions to mitigate temperature and environmental flow impacts on fish prior to commencement of electricity generation.
4. Further survey work on both terrestrial and aquatic ecosystems needs to be undertaken for to provide a more complete platform for ameliorating impacts on species listed under the Bern Convention.
5. Needs and options assessment and cost-benefit analysis of the project is revised also considering cost of new transmission lines, losses to fisheries and other resources associated with diminished flood regimes, loss of cultural heritage values, future decommissioning costs, mitigation measures for direct, indirect and cumulative impacts, etc.

6. The Turkish Government commits to resettlement plans for directly impacted households that are well documented and supported by those households.
7. The project proponents and the Turkish Government develop a credible, publicly available post project monitoring and evaluation system for both Ermenek and Gezende Dams covering project performance, safety and impacts. This system should explicitly consider the impacts of the projects on the protected area downstream. The effectiveness of existing environmental mitigation measures should be assessed and unanticipated impacts identified; opportunities for mitigation, restoration and enhancement recognized, identified and acted on.

WWF recommendations to improve future development proposals:

1. Strategic EIA for all “master plans” in the Göksu Basin and other river basins.
2. The Government of Turkey compares the existing policy framework for planning and implementation of water and energy options with the criteria and guidelines recommended by the World Commission on Dams and institutes a process of internal review and modification of existing policies and legislation.
3. Multilateral agencies provide funding and appropriate capacity to Turkey to review its existing policy framework against the criteria and guidelines recommended by the World Commission on Dams to facilitate implementation of the Commission’s recommendations in future.
4. The Government of Turkey develops a national policy to maintain selected rivers with high ecosystem values and to better manage the impacts of hydropower development.
5. The Turkish Government urgently undertakes an assessment to explore the contribution that could be made by development of alternative energy generation capacity or demand management.
6. All institutions providing or guaranteeing finance should commit to credible and transparent environmental and social standards. All potential investors in large dams must ensure project proponents demonstrate how the project meets the WCD Guidelines. Funding for projects that do not meet the guidelines should be rejected.

References

Anon (2001) Behind Closed Doors: A critical survey of the Austrian official export supporting system. WWF Austria, Erlassjahr 2000 Austria, Greenpeace Austria Vienna

DHKD (1999) *Göksu Deltası Yönetim Planı (Göksu Delta Management Plan)*, TC Çevre Bakanlığı Özel Çevre Koruma Kurumu ve DHKD, March 1999

ENCON (1999) *ERMENEK Barajı ve Hidroelektrik Santrali Çevresel Etki Değerlendirmesi Nihai Raporu (EIA Report of Ermenek Dam and HEPP)*, ENCON Çevre Danışmanlık Ltd. Sti., Ankara, Turkey, October 1999

IUCN (2003) Flow – the Essentials of Environmental Flows, IUCN, Geneva.

Magnin, G. and Yarar, M. (1997) *Important Bird Areas in Turkey*, DHKD, Istanbul, Turkey,

Özhatay, N., Byfield, A. and Atay, S. (2003) *Türkiye'nin Önemli Bitki Alanları (Important Plant Areas in Turkey)*, WWF Türkiye, Istanbul, Turkey,

World Commission on Dams (2000). Dams and Development: A New Framework for Decision Making, Earthscan, London

Websites consulted

Aksam Newspaper 28 April 2003

<http://www.aksam.com.tr/arsiv/aksam/2003/04/28/guneydogu/guneydogu1.html>

Ermenek Consortium <http://www.ermenekbaraji.gen.tr/index1.htm>

General Directorate State Hydraulic Works, Turkey www.dsi.gov.tr

General Directorate Electrical Power Resources Survey and Development Administration, Turkey www.eie.gov.tr

Electric Power Development Co., Ltd <http://www.jpowers.co.jp/english/index.html>

Wetlands International 2002 Ramsar Sites Database A Directory of Wetlands of International Importance 2002 - 7th edition http://www.wetlands.org/RDB/Ramsar_Dir/Turkey/tr001D02.doc

Turkish Australian Online Business <http://www.taob.com.au/news/issue005news015-eng.asp>

BM Mühendislik ve İnşaat A.S http://www.bmmuh.com.tr/english/news/indexMarch_April2002.html

Fishbase <http://www.fishbase.org/>

The Ilisu Dam, the World Commission on Dams and Export Credit Reform The Final Report of a Fact-Finding Mission to the Ilisu Dam Region 9-16 October 2000A Report by the Ilisu Dam Campaign; the Kurdish Human Rights Project; The Corner House; World Economy, Ecology and Development; Eye on SACE Campaign and Pacific Environment Research Center <http://www.khrp.org/publish/p2000/IlisuReport2000.htm>



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