

Hadjibiros, K. (2003). The River Acheloos Diversion Scheme. www.hydrodinosaurs.fr.st, 11p.

THE RIVER ACHELOOS DIVERSION SCHEME

Kimon Hadjibiros

Assistant Professor, National Technical University of Athens
k.hadjibiros@hydro.ntua.gr

The idea of ending up with a River-God

Hercules seems to be back with all his witless vigor. The eternal struggle of the Greeks against the mighty river Acheloos has resumed in full rage. Alas, for the father of Nymphs this could be the last battle. Yet, pulling the Acheloos down to his knees was both technically and financially a Herculean task, which Greece's economy would not be able to bear on its own. It was the European participation that made it possible for Greek governments to launch into this environmental and economic hubris known as the "Acheloos Diversion Scheme".

By pressing ahead, against all odds, for the execution of the diversion scheme Greek governments have tried to plug the holes of an ailing Greek economy by tapping a source of steady EC funding -a modern equivalent of the mythical Amalthean horn of plenty, which Hercules won for the mortals through his victory over the ancient River-God.

The Acheloos diversion project is a singular case because of its magnitude and power to mobilize the spirits of the people. The vision and the goal was that two of Greece's most important natural resources –the Acheloos river and the Thessaly plain- which are separated by the Pindos mountain range, to be brought together for the benefit of the national economy. Particularly since, as many people insist, "the Acheloos flows uselessly into the sea".

The idea of correcting nature by diverting Acheloos with the purpose of supplementing irrigation in the Thessaly plain was first conceived in 1925. The "sleeping giant", as the Thessaly plain was referred to, due to its then unexploited agricultural potential, would be awakened by the fresh inflow of the waters of the river-god. Hydroelectric power generated on the way would be the motive force behind the modernization and industrialization of this promising region. The enormous technical endeavor of the Acheloos diversion fitted perfectly into the technocratic ideological framework of large engineering projects prevailing at the time. It promised also to ensure agricultural "self-sufficiency" for the country –a typical national goal in the period between the two World Wars. Yet Greece lacked both the technical means and the necessary funds needed for the realization of such an ambitious project. But the aspiration itself never died. The potential benefits of the Acheloos diversion were not questioned and they were taken for granted.

Discussion about the benefits of the Acheloos diversion was reinvigorated in 1972 by a Greek engineer with field experience in similar hydraulic mega-projects in the

former Soviet Union. His extravagant concept envisioned not only the diversion of the Acheloos to the Thessaly plain, but at the same time the diversion of five smaller rivers flowing unexploited into the sea. His exorbitant ambition was to create a vast network of inland waterways and harbors to provide a transport infrastructure for the anticipated agricultural and industrial boom, in combination with the extension of the irrigation network and the enhancement of power production.

The project of the diversion of the river Acheloos became gradually an integral part of the local identity in Thessaly. The idea that the Thessalians were entitled to the water of the Acheloos became a deeply rooted belief both among peasants and other local people. The size of the undertaking began to feed expectations of every kind. The project became a political plaything in the hands of central and local governments, opposition parties, politicians and others. Acheloos passed into the collective consciousness as the panacea that would solve virtually most of the country's problems. However no one knew exactly what they were talking about, as the relevant studies were at first non-existent and then insufficient, fragmentary and conflicting.

Thus, the project became a "sacred cow", fertile ground for deal-making. Diverting the Acheloos gained a self-justifying and self-supporting rationale of its own. The project moved along on its own inertia and its own internal dynamic, fed popular expectancies and met important social acceptance. The Minister of Economy expressed a general feeling during a meeting at the Technical Chamber of Greece in 1988, when he said to the audience: "What is the use of a feasibility study?". "Is there any doubt about the feasibility of the project? We don't have any".

Where the Nymphs used to dwell

With its 220 km., Acheloos is the longest river in Greek territory. It has its sources in the shade of a small beech wood high up in the alpine pastures, near the town of Metsovo. It flows from North to South, through the humid western part of continental Greece, separated from the rather dry eastern part of the country by the Pindos mountain range. Rainfall in the western watershed exceeds 1000mm per year while in the eastern watershed it merely reaches 600mm per year.

The aim of the Acheloos diversion project was to tunnel part of the flow of the Acheloos river eastwards, from its natural basin in Aetoloakarnania, to provide for additional water quantities to supplement irrigation in the Thessaly plain. The basic version promoted in the mid '80s called for diverting as much as 1.5 billion m³ of water annually and included the construction of two large dams in the Upper Acheloos region, one at Messochora (135 m.), the other at Sykia (150 m.) and another two at Mouzaki (135 m.) and Pyli (90 m.) where the Pindos mountains begin to give way to the plain of Thessaly. These were in addition to a small dam at Mavromati, vast tunnels (Acheloos-Thessaly diversion tunnel: 18 km through the Pindos range, Messochora-Glystra link: 8 km, Mouzaki-Pyli link: 8 km), corresponding hydroelectric plants, an extensive road network and, most important, a vast irrigation and drainage network in the Thessaly plain.

Originally planned as a multi-purpose scheme, the diversion of the Acheloos was mainly aimed at:

- bringing water to the plain of Thessaly to extend the irrigated land to a total of 390000 ha (the whole of the Thessalian plain up to the contour line of 200 m) as compared to the 200000 ha presently irrigated;
- contributing to the water supply of the urban areas;
- replenishing the overexploited aquifer of the Thessalian plain;
- increasing the flow of Pinios, the main river of Thessaly, which is highly polluted;

Power production (1440 GWh per year) was considered to be only a side effect.

Moreover, the quantity of water to be diverted derived more from wishful thinking than from reality. In most publications the flow of the Acheloos is taken to be 4.5 billion m³ per year at the point its outflow into the Ionian sea. This figure was not verified but it was taken to be true because it was so often repeated. Diverting 2.2 billion m³ per year was thus considered a reasonable amount. However, measurements by the Public Power Corporation during the last three decades indicate that the flow of the Acheloos was overestimated at least 30%. To account for this difference, even theories of climate change were advanced. In fact, the overestimated official figure merely served the purpose of demonstrating the high water potential of the Acheloos.

A technocratic utopia

The first feasibility studies of the Acheloos diversion project were carried out mainly by the Swiss firm Electrowat (1968) and the Canadian firm SNC (1971). Both of them concluded that the scheme was not economically viable.

Nevertheless, Thessaly proved to be a dynamic region with strong and continuing growth based on existing resources. Growth was particularly rapid during the '60s and '70s and was strikingly above the national average. Development was restricted to the plain areas, where growth was impressive and ubiquitous, while the mountainous perimeter was continuously losing people and jobs throughout this period. Plentiful water flowed through irrigation networks with huge losses and soon the irrigated area reached the 200,000 ha. Wasteful water management and increasing irrigation demands are related to the combined effect of cheap water prices and subsidised prices of irrigated crops. Inappropriate irrigation methods result in big water waste (e.g. sprinklers), a decrease in surface water and a considerable lowering of the ground water table. Surface water is mainly abstracted from the river Pinios and its tributaries. Water is pumped by farmers from more than 2000 deep wells served by electric pumps and the water table of the aquifer has been considerably lowered (almost 300 m). Overpumping, fertilizers and pesticides leached from agricultural land and discharge of liquid waste have deprived Thessaly of its most important water resource. The river Pinios almost dries up during summer and it is highly polluted. Tunneling water from the Acheloos to Thessaly would, naturally, not promote a more rational usage of water resources. On the contrary, it would encourage wasteful use and deprive a less developed region of a valuable local resource, for the benefit of a much wealthier region. In any case, there is no available assessment of the existing amount of irrigation water used for the 200,000 ha, and of course no study of the potential savings from rationalisation of irrigation.

The Acheloos diversion project was technically defined in 1983. It was included in the “Integrated Mediterranean Programmes” (IMP), asking for funding from the European Commission. It was presented as an enormous investment scheme primarily for irrigation and, secondarily, for hydroelectric power generation. The Commission concluded in 1987 that “... considering the importance for Greece of hydroelectric production, a participation of the IPM in certain of the works of the Acheloos project might be decided, in relation to profound studies, to be realized or considered, on the ecological and social consequences, on the economic profitability, on the technical and financial feasibility, and on the agricultural impact of this complex”.

Cornucopian politics

Although the Commission was reluctant to support a vast irrigation project threatening to further augment the EC’s already huge surpluses of agricultural products, the Greek government managed to obtain EC funding for a crucial part of the scheme. The mountain dam of Messochora and also a part of a diversion tunnel have been constructed, funded by the IMP. The tactical approach used was to blur the real goal of the Acheloos diversion scheme and to present the construction of the diversion tunnel as part of a series of supposedly “free standing investments” in hydroelectric power generation, beneficial for Greece’s regional development and therefore eligible for EC funding. The Commission agreed to fund these disparate sub-projects with up to 60% of their cost (another 30% would be the contribution of the European Investment Bank (EIB)). The total cost of these projects (excluding the irrigation infrastructure) amounted to 176 MECU (1987 prices). Despite the uncertainties over the scheme’s real goals, a crucial parameter had remained unchanged: it was the quantity of 1.5 billion m³/year of water to be diverted to Thessaly, i.e. about two thirds of the river flow measured at the diversion point. This decisive parameter for deciding on the size of the diversion tunnel, the dams and the hydroelectric power plants was calculated taking only into account the requirements of future irrigation, not those of hydroelectric power generation, presented as the alleged goal of the diversion.

In 1988, the financial consulting firm Morgan Grenfell & Co. compiled a global feasibility study on behalf of the Greek Ministry of National Economy. Among the costs evaluated were the diversion works (dams and tunnels), hydroelectric plants, improvements to irrigation and drainage, agricultural investments, operating expenses, etc. Not evaluated were the costs of smoothing out the regional and social impact of the project, the environmental costs, and the negative effects on the agriculture and fisheries of Aetoloakarnania. On the benefits side, the increase in agricultural production is factored in, along with income from the sale of water and power. The study concluded that the scheme would be marginally viable, provided that all the component projects will have been concluded simultaneously and strictly within the eleven year timetable, under conditions of stable (high) agricultural prices and low inflation rates. The study did not take into consideration the price-reductions imposed by the reform of the Common Agricultural Policy. Meanwhile, the conditions set by the feasibility study were extremely unrealistic: for example, inflation rates in Greece have been in double figures for many years, since the feasibility study. Therefore, under realistic conditions, the project is clearly a loss-maker, even when analyzed with traditional economic tools.

Shifting justification

In fact, the Acheloos diversion is a high-profile project with the corresponding returns in votes and favors, although the contribution to development is definitely negligible. The benefit does not exceed the cost, even when the project is subjected to a conventional cost-benefit analysis and with the most optimistic assumptions. If one adds to the construction and operating expenses of the project the costs of environmental degradation, the loss of wildlife, natural or cultural landscape, as well as the opportunity costs (i.e., the alternative development opportunities sacrificed in favor of the project), the cost clearly exceeds the benefit by a wide margin. Naturally, the feasibility studies have not considered those costs, which are classified as “external or social costs”. All this took place a few years before the adoption of the Water Framework Directive ...

The entire diversion scheme was opened for lump sum bids in the same year, but of the six qualifying bidders only one consortium submitted an offer estimating total planning and construction costs 4,500 million ECU. A contract has been concluded but the proceedings were considered to be infringement of Community legislation concerning competition and the assignment of the works to the consortium was finally annulled in 1994.

During the next years (1989-1994), the Greek governments tried to present the diversion of Acheloos as an energy-only project. This of course made little sense because harnessing the hydroelectric potential of Acheloos would be more effective if it were done on its natural course. The Public Power Corporation has even demanded compensation of 139 billion drachmas from the Greek government for capacity reduction at the existing power stations downstream, as the loss would be greater than the respective gain from plants to be built on the diverted flow.

The Greek government had commissioned a viability study of the energy-only project to the Greek firm LDK Consultants. The result of the study was positive. Yet the Commission entrusted the Swiss firm Colenco to perform the same exercise on its behalf. The result of the second try was negative. Then, the Commission asked the British firm Coopers & Lybrand to arbitrate. The study presented in 1993 stated clearly that the project would not be viable as an energy-only scheme. It went, however, further to suggest a possible solution: the project could be considered as an energy and water supply scheme to meet existing water shortages in Thessaly, excluding all extension of irrigation.

Since the '80s, a group of major Greek environmental NGOs have been mobilized against what they considered as a major environmental disaster. This campaign, which began as an effort to save the valuable wetlands of the Acheloos estuary, was destined to become one of the most important environmental campaigns in Europe. The vast opposition to the Acheloos diversion project has evolved to an international campaign to influence the entire European Structural Funds policy. The Acheloos diversion became the foremost example of Community funds wasted on public works that make no economic or social sense and have big environmental effects. It is one of Europe's “white elephants”, based on an outdated development model. The “diversion

of common sense” as it was pointedly called, became a major European issue with the press and the European Parliament repeatedly raising the subject. By this time, the environmental perspective had to be given the highest priority; 320,000 European citizens made their desire for a different development policy quite clear. Their signatures against the project were handed to European leaders during the Corfu Summit held on June 24-25, 1994.

After a formal complaint submitted by the NGOs, the Council of State, the highest administrative court in Greece, ruled that all construction works had to be suspended, until the authorities prepared an integrated and scientifically sound Environmental Impact Assessment. The CoS decision of 23 September 1994 annulled the Ministerial Decisions for the implementation of the project.

The “soft” diversion

In 1994, the Greek government decided to curtail the project to the first phase only, to reduce the amount of diverted water to 600 million m³ per year- which is closer to the real diversion potential, given the overestimation of the actual Acheloos flow- and to refrain from any extension of irrigation. The dams at Pyli and Mouzaki were cancelled. The diverted water would be simply channelled to a tributary of the river Pinios and no extra irrigation scheme would be developed. In a ministerial internal document it was suggested that the drainage channels in Thessaly could be used for irrigation –a practice that, accordingly to experts, could greatly augment flooding risks. Nobody informed the people of Thessaly how much more expensive Acheloos water would be, if and when it ever reached Thessaly. This “soft” or “ecological” diversion, as it was proclaimed by the Minister of Public Works and the Environment, was stripped of all the costly irrigation works in Thessaly. Despite the radical redefinition of the scope of the project, neither re-designing nor re-dimensioning of the power stations and the diversion tunnel were undertaken. To further justify the transport of the Acheloos water to Thessaly the Greek government pointed to the fact that the situation of extensive over-exploitation of ground water could not be sustained for long. Curiously enough, the figure of excess water demand was given to be close to the amount of water that was needed to extend irrigation to the whole of the Thessalian plain according to the 1989 Morgan Grenfell & Co. study. The Greek government has also proceeded to the direct assignment of both construction and equipment of the hydroelectric power plants to a Russian consortium. This move can be understandable, because, if you have the hydroelectric plants, it is easy to prove that you need water to run them.

The new version of the project is hampered by a series of facts which render it even less likely to perform than the previous one. The components are now overpriced and therefore wasteful. By keeping the size of the works while reducing the amount of diverted water, the cost-benefit ratio decreases. This also applies to the pipeline and irrigation aspects of the project. If the latter is eventually cancelled, then the main argument for the creation of financial benefit –increased agricultural production– vanishes.

A feasibility study was not carried out for this practically new project, which was proposed to the Community Support Framework 1994-1999, the estimated cost

amounting to 248 MECU (at 1994 prices). To avoid difficulties with competition rules, the Greek government decided to split up the works of the “soft” diversion in small sub-projects and to issue separate calls for tender for each one of them.

All these proceedings did not convince the Commission about the wisdom to fund the Acheloos project and no EU money has been paid for the diversion of Acheloos besides the amounts initially provided by the IMP. In July 1994 when the Commissioner for Regional Policies and the Greek Minister of Economy signed the Delors II package, the Acheloos proposal was not awarded any of the applied funds.

A bottomless pit

The campaign of the environmental NGOs against the Acheloos diversion has been a long and hard confrontation. It has teetered back and forth and both sides have shown a strict determination. Following the negative attitude of the EU and under the pressure of Thessalian lobbies, the Greek government has expressed the intention to keep on with the project and to provide it with national funding. Local organizations from the areas that will be directly affected by the diversion and environmental NGOs have submitted new complaints to the CoS. Hearing of all complaints was held in November 1999 and the decision was issued in November 2000. The CoS once again upheld the positions of the NGOs and cancelled the government decision of the environmental terms for the “soft” diversion project.

The technical works stopped, but after lobbying from farmers organizations, the ghost of the Acheloos diversion has appeared again in late 2001. Then, the amount of approximately 200 million Euros was earmarked from the national budget for the continuation of the construction project. Since then, the previous environmental impact assessment has been modified and new administrative approvals have been issued. Some construction works in the diversion tunnel are continuing (end of 2003), but the works for the Sykia dam have not restarted yet. The reservoir of Messochora has still remained empty, because of strong local opposition, although this dam was completed several years ago.

Impact assessment

The diversion of the River Acheloos in Thessaly would indeed cause serious adverse environmental, economic and social impacts. The various parts of the project will influence a wide area and will have impacts on flora, fauna, important biotopes and landscapes located in this area. Some of these impacts will be direct or short-term and others will be indirect or long-term. Most impacts on natural environment are only partly dependent on the size of the diversion. More specifically, there will be impacts related to changes in hydrological conditions, fragmentation of habitats, increased water pollution, construction of mountain roads, excavations or dumping of rubble, intensification of agriculture, changes in land use, changes in micro-climate etc.

The forest and riparian ecosystems of the Southern Pindos, the Acheloos Valley and the Acheloos Delta have been included in the NATURA 2000 and the Special Bird Areas lists. The riverine ecosystems of the middle and upper Acheloos have been

identified as an important habitat for many threatened species of freshwater fish and birds. The whole Delta area with its brackish shallow lagoons, saltmarshes, wetlands and sand-dunes formed by the action of both the Acheloos and the Evinos river, is a very important bird and fish-breeding area. The Acheloos Delta is one of the eleven Greek Ramsar sites.

Blind forces at work

The whole area between Messochora and Sykia became a single construction site. Vegetation was cut, the river was deviated to prepare the ground for the construction of the dams and a dense network of access roads were built on slopes on either bank. Extra width of the roads made up for the lack of quality and the land slides in this steep and loose terrain. The valley has been literally disfigured. Dams, ancillary works and a network of access roads, all monstrosities of sub-standard quality, have caused irreparable damage to the valley's landscape. Extensive erosion and landslides have left great stretches of barren land and are provoking the formation of enormous talus fans descending the steep slopes down to the river's edge. Gravel for the road building is extracted from the river bed while great quantities of uncollected used oil from the trucks and the heavy earth-moving machinery are spilled on the ground right by the river.

Anticipated environmental and other burdens

- Natural landscape of exceptional natural beauty will be heavily degraded by works and by dumping of excavation products in the areas of S. Pindos and Acheloos valley. Widespread excavations and road construction are expected to cause extensive soil erosion and landslides and to destroy unique mountain scenery. The extremely lengthy reservoir of Sykia, subject to dramatic changes in the water level, will flood and reveal in repeated cycles a broad band of base land.
- South Pindos biotopes will be extensively destroyed following construction and operation of upstream works. A part of wild fauna (big mammals, birds of prey etc.) will be heavily pressurized by the works and mainly by fragmentation of biotopes.
- The river Acheloos ecosystem and underground waters along it will be significantly degraded following its decrease of flow. The coastal wetlands will suffer from critical reduction in freshwater input.
- Biotopes, surface and ground waters in Thessaly will be significantly degraded due to the constructions and also to anticipated intensification of chemical products use in farming.
- The extinction of populations of internationally protected species is possible. Populations of other species will be seriously disturbed both during and after the construction by the alteration of the natural landscape.
- Cultural impacts are mainly related to the destruction of important monuments, such as the 11th century monastery of St. George of Myrophylo, as well as a number of valuable old stone bridges, which will be inundated by the reservoirs. Other monuments will also be threatened by the construction works.
- Many important socioeconomic impacts are probable, but they have not been adequately studied.

It may be concluded that the project of the River Acheloos diversion will most likely cause severe degradation of great parts of natural environment in the broader area of influence and also severe degradation of the cultural character of a part of this region. This degradation will be in many cases equivalent to a total extinction of ecological or cultural elements or to severe losses. Most of the major impacts will be irreversible. Environmental systemicity and presence of serious indirect and long-term impacts may hide potential dangers of causing even more severe degradation in the future.

Problems in assessing potential impacts

The assessment of potential impacts presents significant peculiarities arising from the nature of the project itself and also from the way this project has been forwarded. Uncertainties arise due to:

- the breadth of the area being influenced (a significant percentage of the country's total land area)
- the long duration of the project (some decades)
- indetermination as regards planning (what is the total project?)
- lack of necessary data (insufficient or incomplete studies)

Time uncertainties

The project would take many years to complete, even under the most favorable conditions. However, it is most likely that the project will be greatly extended in time, mainly because neither continuous nor sufficient financing can be reasonably expected. Of course, this fact will have adverse impacts on the yield of investments which is estimated as very low. More than sixteen years have already passed by since the completion (1986-87) of relevant environmental impact assessment and the project is not under way yet. Therefore, it is only realistic to say that the time span between theoretical assessment and actual appearance of environmental impacts will be some decades. Following this time uncertainty, there is an obvious inability to assess environmental impact, especially indirect and long-term one, which may be rather serious, and the same holds true for most of socio-economic and spatial impacts.

Another problem related to time aspects is that completion of the irrigation works in the Thessaly plain would need several decades, because of organization, management (for example expropriations) and financing problems. However, the life expectancy (due to filling with material brought in) of basic irrigation reservoirs is also one of this order (for example, for these at Pyli and Mouzaki, Electrowatt estimates 75 years). As a result, if and when full technical capability for use of water downstream is available, it is likely that the main upstream works will already start presenting operational problems.

Uncertainties of the plan itself

The project was officially announced and discussed twenty years ago, but no plan was definitive. Various plans have been presented, depending on different circumstances that seem to change the purpose of the project (hydroelectricity, agriculture, watering, even environmental protection), different quantities of water to be diverted, the construction or not of certain reservoirs (for example Mouzaki reservoir), the construction or not of an irrigation system in Thessaly etc. The finalization of the plan should be an essential and necessary condition for the assessment of impacts. Because of the interdependence of different environmental parameters, each significant change in the plan calls for a new study of its impact on the environment. A final plan should be nothing less than a plan, which includes all the works that will be needed for the realization of its aim. Therefore a plan that deals only with the upstream works, for example, can not be considered as final; neither can any dealing only with irrigation works. Moreover, the use of studies based on an earlier plan for the assessment of impacts of a later, revised plan is contradictory to the philosophy and practice in the field of impact assessment.

Uncertainties of the “soft” diversion project

The “soft diversion” project involves fewer reservoirs, but the same diversion tunnel, while no irrigation channels are included. This project should be considered as rather semi-complete as regards design and it is very likely that reservoirs would be added in the future along with an irrigation system, in order to make use of the irrigation potential of the project. It is also likely that more water would be diverted in the future, since the dimensions of the tunnel allow this. Therefore, an assessment of environmental impacts of this project cannot be complete, because the assessment must refer to the project as a whole, taking into account all reasonable possibilities which at present are not pushed forward for various reasons, but which will be most likely brought forward in the future, when strong pressures are exercised. It is not possible to assess real impacts of the diversion tunnel without taking into consideration all consequences of the projects and of the activities, which will probably follow when this tunnel will operate. In fact, the “soft” diversion is a manoeuvre that conceals the whole picture. No one knows exactly what the real project is, how much it will cost, what its goals are and how they will be achieved. Although the “soft” diversion, without irrigation works is nonsensical, the rationale behind it could be simple: let us commence the work and whenever completed, we may invoke the project’s inability to work properly and proceed with the rest of it in the plain. The money will be found, because no one will want to leave the investment half-finished.

Hypocrisy at work?

The initially fuzzy concept of the diversion of the Acheloos to Thessaly became a pressing political reality with a momentum of its own. The contours and the scope of this vast project have been repeatedly modified to adjust to financial realities and to suit the political conjuncture. The project suffers from lack of a compelling financial rationale. A negative climate has been created in which substantive dialogue and restrained objective examination of the issue have been stifled. In these conditions of darkness, every opposing opinion was treated as nearly treacherous. Successive Greek

governments have used dubious methods to ensure further EU funding and they had to face a double pressure: the pressure from the materialization of their own rhetoric and the pressure from the EU funding mechanisms.

In this light, the Acheloos Diversion Scheme does not exactly seem to translate the environmental and development policy principles of the European Union in practice. Diverting rivers in order to permit continuing waste of irrigation water is not what, by contemporary standards, is understood as “sustainable and sound use of natural resources”. Besides, tolerating wasteful irrigation practices or flushing-down the pollution of the river Pinios using the waters of the Acheloos is not really “preventive and precautionary action” or problem solving at source. Nor is the piecemeal approach adopted by Greek governments and the presentation of a major irrigation scheme as a series of ordinary independent hydroelectric projects an example of either integrated planning or of partnership with the European Union.

Acknowledgements

The author would like to thank Ms Christina Giannakidou for her valuable suggestions and help in preparing this presentation.

Bibliography

Efthymiopoulos I., K. Hadjibiros and D. Tsantilis (Eds). *The Acheloos trial*, Stochastis/DIPE, Athens 1999, 246 p. (in Greek).

Hadjibiros K. The river Acheloos diversion project. Environmental considerations. National Technical University of Athens, Athens, 1995.

Nantsou Th. The case of the Acheloos diversion, WWF Greece, Athens, 2002.

National Technical University of Athens. Report on a global appraisal of the river Acheloos diversion plan, Athens, 1994.

Politis Y. Introduction to the Acheloos diversion project, Kouvelis S. Economic performance, Scoullou M. The chronicle of the actions of the environmental organizations against the diversion project, Vassilakis K. The impact on natural environment, in: *Acheloos: Eternal river-Ultimate destruction*. WWF Hellas, Elliniki Etairia, HOS, Nea Ecologia, Athens 1996, 36 p.

Society for Ecology and Development. The Acheloos diversion scheme, leaflet, Athens, 1992.