Strategic Environmental Assessment: Needs and Opportunities in Mexico¹

Juan Palerm

Juan Palerm is Researcher and Lecturer in Environmental Policy in the Department of Project Engineering, Universidad de Guadalajara, Mexico; Apdo. Postal 5-737, Zapopan, Jalisco, C.P. 45040, Mexico; Tel: +52.33.3656.0767; Fax: +52.33.3656.3639; email: jpalerm@newton.dip.udg.mx.

Abstract

Albeit officially a 'democracy' for nearly a century, Mexico's political system may at best de described as a 'consolidating democracy'. Mexico was led by a single party for over seven decades, whose idea of planning rarely involved long-term scenarios, public participation or any sort of environmental assessment. Things have not changed much since the gradual turn to a more consolidated democratic system, although EIA legislation has been passed and civil society has matured. As yet there are no intentions to assess plans and programmes on their potential environmental impacts. Planning schemes are increasingly becoming more controversial with regards to their potential environmental and social impacts and the limited opportunities for public involvement, leading to a loss of legitimation of planning authorities and resulting in delays to implement associated projects, not to mention the resulting environmental impacts of plans and programmes (and their associated projects) that respond to sectorial and political objectives with little regards to their environmental dimension. Planning practices are not keeping pace with the consolidating of the democracy in Mexico. This paper analyses the needs and opportunities to implement an SEA system in Mexico, based on a case study of the water management planning in the Lerma-Santiago-Chapala watershed, a comprehensive review of current planning and environmental assessment systems, and making reference to other relevant and controversial planning schemes such as the Puebla-Panama Plan.

Key words

Strategic Environmental Assessment, Environmental Planning, Mexico, Latin America, Watershed Management

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Introduction from Sustainable Development to Strategic Environmental Assessment

The concept of Sustainable Development (SD) has been in use since the early 1980s, but its most widely recognised milestones are the report prepared by the World Commission on Environment and Development 'Our Common Future' (commonly known as the Brundtland Report) and the Earth Summit in Rio (especially through Agenda 21). In the Brundtland report SD was defined as '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*', while Agenda 21 asked governments to integrate SD into their national development strategies.

One of the drawbacks of SD as a concept is the lack of a clear definition and guiding principles (although probably also a reason why the term has become so widely accepted). Nowadays it is generally agreed that SD has the following dimensions to it: economic growth, social development, protection and enhancement of the environment, and regard to the needs of future generations (inter-generational fairness). Moreover it is becoming widely accepted that SD must also be understood in its procedural dimension, e.g. decision-making in the context of SD must be participatory, transparent, and accountable (see COWI *et. al.*, 2004).

If policy-making and planning is left to an open "balancing-out" of the economic, social and environmental dimensions, the environmental dimension is the one that tends to be "traded-off" most of the time, as policies, plans and programmes are generally assessed against stated sectoral objectives (mainly in economic terms) (Palerm and Richardson, 2002).

Strategic Environmental Assessment (SEA) becomes a powerful tool to ensure that the environmental dimension is adequately addressed in the definition of policies, plans and programmes (PPPs). In this regards for SEA to be most efficient it must be undertaken from the earliest stages of the planning process and should be integrated in the PPP-making process, rather than be applied as an *ex-post* assessment (Sheate *et. al.*, 2001).

SEA is only recently gaining recognition as an assessment tool, mainly in developed countries. Suffice it to mention that the European Union directive on SEA was only adopted in 2001 and full transposition into Member States' legal systems is not due until 21 July 2004. The Johannesburg Earth Summit in 2002 reminded us that most of the planning in the world is not sustainable, and highlighted SEA as an effective instrument to address this situation. In Latin America the concept of SEA is very new and is yet to enter in the environmental policy debate.

As far as Mexico is concerned, although EIA legislation has been in place since 1988, no SEA requirements have been devised or are currently being officially considered.

Best-practice SEA

As pointed out above SEA is a relatively new concept that arose from the need to achieve better levels of integration of the environment in policy making. At the same time the concept has been interpreted in diverse ways, from a mere extension of the EIA process to PPPs to SEA as an integral element in the planning process. Sheate et. al. (2001) have defined SEA as follows:

"SEA is a systematic decision aiding procedure for evaluating the likely significant environmental effects of options throughout the policy, plan or programme development process, beginning at the earliest opportunity, including a written report and the involvement of the public throughout the process".

A best-practice SEA may indeed be confused with a good integration of the environment in the planning process (Palerm and Richardson, 2002), with the difference that SEA involves the determination of the environmental baseline, a systematic assessment of potential environmental effects as well as a written report.

A study undertaken for the European Commission on SEA and integration of the environment into strategic decision making identified the following success factors (Sheate *et. al.*, 2001):

- SEA needs to be a **transparent** process that allows environmental considerations to be highlighted.
- Successful SEA assesses the impacts of **alternative options** rather than option alternatives.
- Widespread **involvement of stakeholders, policy makers and the wider public** is crucial for successful SEA.
- SEA needs to be a **systematic process** involving different institutions in a common reporting framework.
- The most successful SEA generally occurs where there is a legal obligation to require it.
- Successful SEA involves wide use and dissemination of baseline and assessment information.
- An independent body that can **review or audit the assessment process** and content is needed to provide sufficient incentivy to carry out SEA and accountability.
- Successful SEAs have been the start rather than the end of a **process of integration**, and may be a catalyst for developing further guidance and training.
- Successful SEA is an **active**, **participatory and social learning process** for all parties, in that stakeholders are able to influence the d ecision-maker, and the decision-maker is able to raise awareness of the strategic dimensions of the policy, plan or programme. All can learn from the process and from each other.
- Successful SEA is a **continuing and iterative process** in which the decision-maker is constantly being updated with the consequences of the implementation of the policy.
- Successful SEA depends on high quality and rigorous application of **assessment methodologies**, whether qualitative, quantitative or both.

Thus the effectiveness of SEA must be seen in terms of both substantive (e.g. baseline environmental survey, reporting, transparency, accountability) and procedural (e.g. public participation, identification and assessment of potential impacts) elements. These best practice principles are coherent with the principles of discoursive democracy, where decisions are no longer left to hermetic groups of "experts" but rather are open to public scrutiny and involvement.

Although the loss of legitimacy of the scientific-technological paradigm is more widely extended in developing countries, it is not a new process for Latin American consolidating democracies. However, the effectiveness of discoursive decision-making processes is conditioned to the existence of a consolidated and healthy civil society, a condition which is not yet met in Mexico. The implementation of an SEA system in line with discoursive planning practices must respond to the particular characteristics of Mexico as a consolidating democracy, which are summarised below (for further details refer to Palerm and Aceves, submitted).

Planning and Environmental Assessment in Mexico

Mexico is a Federation integrated by 32 States. Planning by the administration is undertaken according to the Law on Planning (1983), under which the federal executive must prepare a *National Development Plan* (NDP) that must "*pursue the political, social, cultural and economic ends and objectives contained in the Political Constitution*". The NDP defines the *Sectoral Programmes* that will be developed. As well, the centralised public administration must undertake their own planning in line with the objectives and priorities defined in the NDP.

National planning is undertaken through the so-called *National System of Democratic Planning*. This system considers the input of various actors in the planning process: the different institutions of the federal public administration and the State governments, as well as interested social groups, indigenous peoples and communities.

The organisations that represent workers, peasants, and popular groups, as well as the academic, professional and research institutions of corporate organisms and other social groupings participate as permanent consultative bodies in those matters related to their activities, through *popular consultation fora* (in which deputies and senators of the Congress of the Union also participate). As well the law establishes that indigenous communities must be consulted and may participate in the definition of the federal programmes that directly affect the development of their peoples and communities.

At this point it must be clarified that these provisions are far from being effectively instrumentalised, both due to the incipient civil society and to a lack of participatory culture in the administration and society.

Article 21 of the Law on Planning states that the NDP must take into account the 'environmental variables' related to the economic and social activity. This provision is in line with the definition of sustainable development given in the Law on Ecological Balance and Environmental Protection (LGEEPA) of 1988: "the process that can be evaluated through criteria and indicators of an environmental, economic and social nature that tends to enhance the quality of life and the productivity of the people, founded on adequate measures for the preservation of the ecological equilibrium, environmental protection and use of natural resources in such a manner that the needs of future generations are not compromised". However it is not specified how an adequate integration of the environment in the planning process will be guaranteed.

The current NDP covers the period 2001-2006 and refers to sustainable development mainly in its environmental dimension, but makes no reference to the assessment of policies, plans and programmes in their environmental dimension. There are however initiatives to integrate the environment in sectoral policies. For example, the National

Programme for the Environment and Natural Resources 2001-2006 "Everybody working for a common objective: the Sustainable Development of Mexico" defines as one of the objectives of its 4th Strategic Programme on the promotion of sustainable development, to "incorporate the environmental dimension in political, economic and social decision-making in all levels of government, economic sectors and society". This is further substantiated through the Programme to Promote Sustainable Development in the Federal Government, which should be the adequate forum to promote an environmental assessment of policies, plans and programmes, but is not.

This paper focuses on the water management planning process in Mexico, being one of the sectors where the environmental dimension is given greater emphasis.

Case study: water planning in Mexico and the Arcediano dam controversy

Introduction

A large dam is about to be built in the outskirts of the city of Guadalajara – the Arcediano dam - in order to provide Mexico's second largest urban centre with a drinking water supply, as an alternative to its current source, the endangered Lake Chapala. The project has proved controversial on various fronts: costs, technical feasibility, environmental impacts, social impacts, health issues, lack of adequate planning at watershed level, non-participatory processes, and alleged personal interests of people in power.

A brief review is made of the water planning process in Mexico, from the National Hydraulic Programme, down to the decision to build the dam. The main focus of this study is, however, the process from the moment it is decided that the concession to extract water from Lake Chapala will be withdrawn, to the final decision to build the Arcediano dam. It analyses the critiques to the Arcediano dam project and the regional watershed management planning process taking into account the principles for best-practice SEA outlined above.

The NDP establishes that the 13 hydrological watersheds will be, for the purposes of planning and environmental management, managed through an Integrated Watershed Management Scheme. However a definition of Integrated Watershed Management is not given nor guidance provided on how to achieve it. Even internationally it is not clear what this concept really means, but there is a general understanding that it implies addressing water planning at watershed level, taking into account the different environmental components and water uses in the same planning process and allowing effective public participation throughout the planning process.

Overview of the water planning process in Mexico

In the water management sector the competent authority at the Federal level is the National Water Commission (*Comisión Nacional del Agua* – CNA), and at the State level they are the different State Commissions for Water and Sewerage Treatment (*Comisiones Estatales del Agua y Saneamiento* – CEAS). The CNA has responsibility to prepare the National Hydraulic Programme (*Programa Hidráulico Nacional* – PHN) as well as the Regional Hydraulic Programmes (*Programas Hidráulicos Regionales* – PHR).

Mexico is divided into 13 Hydrological Regions, each formed by one or more watershed and 102 sub-regions (based on political boundaries), ensuring that the hydraulic watershed remains the basis for water management (see Figure 1). This case study corresponds to water planning in Hydrological Region VIII: Lerma-Santiago-Pacífico. With 13% of the country's surface (190 438 km²), it partly contains eight States² and fully contains two other States³. It begins with the birth of the Lerma River in the State of Mexico, running west until its outflow in Lake Chapala, and continues with the birth of the Santiago River in Lake Chapala until its outflow into the Pacific Ocean (see Figure 2).

² State of Mexico, Michoacán, Querétaro, Guanajuato, Jalisco, Zacatecas, Durango and Nayarit.

³Colima and Aguascalientes.





Source: CNA (2004).





Source: CNA (2004).

Participation of stakeholders in the water planning process takes place through two main consultative bodies: the Watershed Councils (*Consejos de Cuenca*) and the Water

Consultative Council (*Consejo Consultivo del Agua*), as well as through consultation with independent experts and comments submitted by the general public.

The Water Consultative Council is integrated by members of the civil society with the aim to provide assistance to competent authorities in undertaking the necessary strategic changes in the sector, as well as to promote, coordinate and lead initiatives to achieve public awareness and culture in efficient water management. In practice however, the representativeness of their members is questionable, and their effectiveness in influencing the planning process is very limited.

Watershed Councils are discussed in more detail below, as they are a key figure for the new water planning processes in Mexico.

Watershed Councils

A new scheme for water planning and management began to be developed in 1989 when the CNA was created as the sole Federal authority dealing with water management. Although the CNA is now part of the Ministry of Environment and Natural Resources (SEMARNAT), it continues to function as an independent agency (Tortajada, 2001) as it reports directly to the federal executive.

The Regulations of the Law on Natural Waters were amended in December 1997 in order to define the structure of the Watershed Councils and thus integrate relevant authorities and water users in the watershed planning process.

Watershed Councils were defined as consultative bodies formed by the CNA to interact between the CNA, competent authorities (federal, state or municipal) and water users of a specific watershed, in order to formulate and implement programmes and actions to achieve better water management, the development of the hydraulic infrastructure and services and the conservation of watershed's resources.

In spite of the faith placed on the Watershed Councils as bodies that will help achieve truly integrated watershed management, their internal structure and functions hinder them from being effective actors in the planning process.

Watershed Councils are chaired by the CNA and also integrate representatives from the State authorities, water users⁴, and invited experts⁵. Water users have voice and vote, as well as representatives from State government; invited experts only have voice and the chair (CNA) has voice and quality vote (Castelan, 1999). However it is important to point out that "water users" are only those who have titles to withdraw and use water and does not refer to the wider stakeholders, apart that water users often do not represent the views of the majority of stakeholders in their sectors (Tortajada, 2001). As well citizens and civil society cannot participate unless they are invited by the CNA and, judging by recent experiences, the CNA only invites those parties agreeable to them (Castela n, 2000).

⁴ Regional Committee of Irrigation Users, Regional Committee of Industrials, Regional Committees of Service Providers, Regional Committee of Fish Farmers, Regional Committee of Drinking Water Supplying Companies and Organisations, and other Regional Committees.

⁵ From academia, government organisms and NGOs.

An important shortcoming of Watershed Councils is that they are only consultative bodies and have no real power to influence the planning process, although an exception may be pointed out in the Lerma-Chapala Watershed Council, where they have managed to have a larger influence.

The National Hydraulic Programme (PHN)

The current PHN was prepared on the basis of support documents drawn at regional level. First *Regional Hydraulic Diagnoses* were prepared. On the basis of the se diagnoses, *Regional Strategic Lines for Hydraulic Development* were defined; these identified the causes and effects of the problems associated with water management in each region, defined scenarios to 2025 with respect to water needs for different productive sectors, and proposed alternative solutions. Finally the *Great Vision Regional Hydraulic Programmes 2001-2025* were prepared, which presented an outline of potential actions.

The PHN puts forward a *Vision* for the hydraulic sector in Mexico to the year 2025 as well as scenarios. It establishes *National Objectives*, *Goals*, *Policy Guidelines*, *National Strategies*, *Regional and Thematic Strategies*, and *Regional Objectives*.

The relationship between water planning and sustainable development may be envisaged in the PHN. Under the National Objectives for the hydraulic sector, the third one is to "achieve an integral and sustainable water management in watersheds and aquifers". Under the Basic Premises of the Policy Guidelines in the PHN, the need to integrate the economic, social and environmental dimensions in order to achieve a sustainable development is made very clear and is consistent with the definition given in the LGEEPA: "the sustainability of development must precede the immediate economic and political interest, for which a fundamental reformulation of the decision making process is required, such that in the planning for development, a full integration of the economic, social, political and environmental factors is achieved…".

The National Strategies defined in the PHN make reference to the need to seek solutions based on the management of demand as well optimising the existing infrastructure, as approaches that need to be addressed prior to increasing the supply: "*integrated and sustainable water management in watersheds and aquifers must be achieved seeking a substantial modification of the focus on satisfying the demand for water; changing from a focus based on increasing the supply through large scale infrastructure projects to one that gives preference to the reduction of the demand by achieving a more efficient use of water, recovering physical losses and re-using volumes of water".*

The Regional Hydraulic Programme – Hydraulic Region VIII

The PHR for Region VIII was prepared primarily based on two background documents: the Regional Hydraulic Diagnosis (1996) and the Strategic Lines (1999). The Diagnosis had already identified the type of infrastructure works that would be required including cost estimates. As far as the Strategic Lines are concerned, the watershed's problems and alternative solutions were allegedly agreed with water users as well as other social groups involved in the planning process. The causes and effects of water management problems in the region were identified, scenarios to 2025 were devised with regards to water demand for different sectors, and alternative solutions defined. On the basis of the

two above- mentioned documents the *Great Vision Regional Hydraulic Programme* 2001-2025 was prepared, which included an outline of actions.

The PHR defines Regional Objectives, Strategies and Priority Programmes. Out of these Objectives 1 and 4 relate to the Arcediano dam project(Table 1).

Table 1. PHR Objectives related to the Arcediano dam project.



On the basis of the objectives, strategies, programmes and actions, so-called main *Programme-Projects* were identified.

The PHR states that in seeking alternatives sources of drinking water for the Metropolitan Area of Guadalajara (MAG), various alternatives were studied, including Arcediano, Loma Larga, San Isid ro aqueduct, and El Salto-Calderón aqueduct⁶, and finally states that the Arcediano dam project was selected, without providing an indication of the reasons behind this decision.

Water supply for Guadalajara: background and evolution of a crisis

The MAG is the second urban centre in the country, with a population nearing four million. Until the 1950s the source of drinking water for the MAG was the extraction of water from aquifers and deep wells. In 1953 the Covenant of the Santiago River was signed, which allowed Guadalajara to take water from this river and by 1957 the Santiago River was the main source of water (Durán and Torres, 2001). It must be mentioned that the Santiago River is an outlet from Lake Chapala, and thus the water was actually considered to be taken from Lake Chapala (see Figure 3). In the 1970s the canal of Atequiza, was built, which took water from the Santiago River (see Figure 3), allowing an additional supply of 4 m³/s. In the 1980s the Chapala-Guadalajara aqueduct was built, taking water directly from the lake (see Figure 3).

⁶ The PHR does not provide the full list of studied alternatives, nor does it describe what the mentioned alternatives consisted of.



Figure 3. Water supply from Lake Chapala and Santiago River (adapted from SIAPA and CNA, 2002).

By the late 1980s the levels of Lake Chapala started to decrease⁷ and in 1990 an authorisation was given to use the water from the Verde River (Durán and Torres, 2001). The so-called *Sistema de La Zurda-Calderón* (La Zurda-Calderón Sysem) was devised in 1982. This scheme consisted of three phases in order to supply the MAG from the Verde River. Phase 1 consisted of building the Calderón dam (66 Mm³), building the Calderón-Guadalajara aqueduct (31 km) (see Figure 3) and building the first part of the San Gaspar purification plant (3 m³/s); this phase was completed in June 1991. Phase 2 consisted in building the El Salto dam (80 Mm³), building the deviation infrastructure of Purgatorio (pumping system) and completing the second part of the San Gaspar plant (5 m³/s); only the El Salto dam was built. Phase 3 consisted of building the Zurda I and the Zurda II dams and completing the Purgatorio pumping system, which was never built. See Figure 4.

⁷ It must be noticed that the crisis of Lake Chapala is not only associated to the water supply to the MAG, but also to extractions of water from the Lerma River to supply other major urban, agricultural and industrial areas upstream.



Figure 4. The La Zurda-Calderón scheme (adapted from CEAS, 2004).

The La Zurda-Calderón scheme was abandoned for reasons which are not clear. The CNA claims it was due to pressure from the civil society, but other versions point to the large costs of the pumping system (600 m).

Currently the MAG receives 9 m^3/s of water although its needs are estimated to be 12,5 m^3/s . This supply comes mainly from Lake Chapala (4.5 m^3/s) and from aquifers (3,0 m^3/s), and a smaller portion from the Calderón dam (1,5 m^3/s). It is worth noting that 43% of the supply from aquifers is lost due to a deteriorated water distribution infrastructure.

Since the 1990s the level of Lake Chapala started to decrease dramatically, due in a large part to the extraction of water from the Lerma River upstream. In an attempt to protect Lake Chapala, finding alternative sources of drinking water for the MAG was defined as a priority.

Water supply for Guadalajara: seeking alternative drinking water sources

The so-called Citizens' Council, with a base in the Chamber of the Construction Industry and integrated by construction companies and water technicians (Mural, 2001) opened up a forum to select the best alternative to supply water to the MAG, with the only condition that alternatives had to provide a flow of $10,4 \text{ m}^3$ /s for the MAG during a period of 30 years. A total of 53 alternatives were presented, ranging from mere ideas, to more detailed projects.

By this stage the CEAS for the State of Jalisco had been created (May 2001) and they formally recognised the Citizens' Council and accepted the 53 alternatives for their

evaluation⁸. All alternatives were presented in a series of public meetings which took place from the beginning of March until the end of May, 2001. A consulting company was given the contract to undertake the analysis of the alternatives. As a first step the proposals were classified under three categories: projects selected for a more detailed analysis, support projects and proposals and regional development projects and proposals.

On a first screening 14 alternatives were selected. According to the analysis report's executive summary (Grupo Interdisciplinario de Análisis, 2002) – it was not possible to get hold of the full report - the analysis took into account "geological, geotechnical, water quality, environmental, social, etc." factors. However, this diversity of analytical factors was not reflected in the report; for example, the comparative analysis of the final six alternatives is reported in terms of technical feasibility and cost mainly (and no reference is made to potential environmental impacts⁹).

A second screening reduced the number of alternatives to nine, out of which three were excluded, two for not being able to supply the required flow of water, and one because it "presents a different multisectorial integration of projects". The report does not specify what this reason of exclusion consists of, or why it is a reason for excluding the project.

Out of the remaining six projects five consisted of dams on the Verde River and one of a system of deep wells in the San Isidro aquifer. These alternatives received a more detailed analysis in terms of costs (investment and operation) and volume of water supplied.

Finally two alternatives were selected for a more detailed analysis: the Arcediano dam and the Loma Larga dam. The Arcediano project consists of building a 404 Mm³ dam in the junction of the Santiago and Verde rivers (i.e. the canyons of Huentitán and Oblatos), with a surface of 803 ha. The Loma Larga project consists of a 450 Mm³ dam on the Verde River, with a surface of 1350 ha. See Figure 5 below.

⁸ Actually the then head of the Citizen's Council, Mr Enrique Dau Flores became the director of CEAS.
⁹ The only exception is a brief mention that one of the projects would require a "larger" area to be flooded.



Figure 5. Arcediano and Loma Larga dams (adapted from Centro de Evaluación de Proyectos, 2002).

A comparative technical and economic feasibility study was carried out by the consulting company Sistemas Hidráulicos y Ambientales for these two alternatives, with the investment and operation costs being the primary decision criteria. A comparative socioeconomic analysis for the two sites was undertaken by the Centre for Project Evaluation of the Autonomous University of Guadalajara, based on a costbenefit analysis which took into account the water demand (current and future), the opportunity cost, investment costs, costs of complementary infrastructure works, and operational and maintenance costs. Both analyses conclude that Arcediano is the best alternative.

Initially it was calculated that Loma Larga was the cheaper option, but after a revised analysis CEAS determined that it would be more expensive. Moreover, the Loma Larga project was also rejected on the grounds that is was not technically feasible, due to the geological conditions. Rejecting the Loma Larga project, Arcediano became the sole alternative.

The Arcediano dam controversy

As mentioned in the introduction to this case study, the Arcediano project has proved controversial on various aspects. In order to understand these controversies it is necessary to draw attention to some particularities of the project, which are explained below.

The dam will partially flood the canyon of Huentitán-Oblatos, which is a nature protected area at municipal level, and it will collect the waters from two rivers: Verde and Santiago. The waters from the Verde River are relatively clean, but the waters from the Santiago River are very polluted, as it receives the non-treated wastewaters from major urban and industrial centres located along its course.

Technically and economically the following arguments are used against the project:

• The water would be lowered 560 metres and then pumped up to supply Guadalajara, a strategy which will make the system very expensive to operate. This is considered especially risky as the cost of electric energy has increased 210% since 1998

without relating to inflation, thus the cost of pumping could increase significantly in relation to the estimates made.

- The project would require an initial investment of 6700 million pesos (670 million dollars), being the largest public investment project in Jalisco in the last years. This is considered as a very large investment for which an adequate cost analysis was not undertaken.
- Clean waters from Verde River will be mixed with polluted waters from the Santiago river, significantly lowering the efficiency (and increasing the costs) of the treatment systems. Addressing this concern the project considers building a series of waste water treatment plants at discharge points along the Santiago River.

However, this scheme has two arguments against it. Firstly it must be considered that there is an obligation for the government to treat those waters independently of the current project, and thus this scheme should not be seen as a positive impact inherent to the Arcediano project. Secondly, there are doubts that such waste water treatment plants will be operated efficiently, as they are to be run by municipal governments with low budgets, and experience shows that such treatment plants do not receive adequate maintenance or monitoring.

Environmentally the following objections have arisen with regards to the project:

- The canyon of Huentitán is a nature protected area at municipal level as it hosts a variety of species of flora and fauna. However the decree that proposes the protected area was never formally published and it was eventually withdrawn (after the Arcediano project was proposed).
- There is little sensitivity for the lifestyle of the affected community (Arcediano), which leads a traditional lifestyle and depends on its environment for its subsistence.
- It is suspected that the nearby landfill of Matatlán is filtering leachates to the area that will be flooded.
- It is suspected that the sediments of the Santiago River are polluted and may release pollutants to the dam. By the time the costs of the Santiago River clean-up strategy were defined, this possibility was not considered and which, if true, would significantly increase the costs.

Other arguments against Arcediano have to do with the fact that alternatives to the project exist which have been neglected, that the decision-making process has not been transparent, and that there are allegedly strong economic interests from people in power to carry out the project.

• Although federal environmental policy establishes the need to carry out integrated watershed management, some detractors claim that the solution is not to seek sources of drinking water alternative to Lake Chapala, but to solve the problem at watershed level (Peniche, 2003; Mural, 2003a) and keep using Lake Chapala as a source. Currently the agricultural sector uses 84% of the watershed's water through obsolete and inefficient irrigation systems (Mural, 2003b), and over 40% of the groundwater extracted in the MAG is lost through leaks in the system.

- According to various technical experts alternatives do exist to Arcediano, some of which offer a better solution. One of such alternatives is the long abandoned La Zurda-Calderón system; however these infrastructure works have been delayed for nearly 10 years now (Mural, 2003b). As well the Calderón dam could be enhanced in terms of infrastructure in order to be able to deliver up to 3 m³/s of water as opposed to the 1,7 m³/s it currently delivers, offering a partial solution.
- Detractors claim that the whole decision-making system has been non-transparent and participatory initiatives been a sham. The general public was invited to present alternatives; a total of 53 proposals were presented which were "analysed" by the CEAS and rejected for not being feasible (with the exception of Arcediano). The analyses were not made publicly available and no specific reasons were offered for the rejection of the alternatives, according to some detractors, because the proposed projects were never considered by the CEAS.
- Finally some detractors claim that strong personal economic interest lie behind the "stubbornness" of the government to impose Arcediano. They claim that some persons in power have very cheaply bought lands that will be located at the margins of the dam in order to speculate with the increase in land value (PVEM, 2003; Castro and Maguey, 2003), as the future artificial lake is expected to become a touristic and recreational area.

As a final step in the permitting process the environmental legislation required the presentation of an Environmental Impact Statement (*Manifestación de Impacto Ambiental*–MIA), which was prepared by the consulting company ORVA Ingeniería in May 2003. CEAS also commissioned an MIA for the Loma Larga damto the consulting company AyMA Ingeniería y Consultoría, but this study was never submitted to the competent environmental authorities.

The MIA for Arcediano is a very poor quality document that lacks the application of formal environmental impact identification and assessment tools and methodologies, does not address a series of potential impacts and ventures simplistic conclusions not grounded on rigorous analyses. The logic behind preparing the MIA for Arcediano seems to be the justification of any potential impact with the argument that eliminating the extraction of water from Lake Chapala offsets any negative impact. The MIA was also criticised for not addressing the regional impacts of the projects, as required under the EIA regulations (Gutiérrez-Nájera, 2003).

The MIA for Arcediano was submitted to the SEMARNAT on June 2003. On August the SEMARNAT requested a technical opinion from affected local governments as well as from the competent environmental authority of the State of Jalisco. The EIA file was made publicly available, albeit in SEMARNAT's office in Mexico city, and a public meeting was held on September after being requested by the pubic (as well comments were provided in written form by several members of society). The MIA was finally approved on 27 October 2003, establishing 25 conditions, 14 of which must be in place prior to beginning construction works and 11 to be implemented during construction (Hernández and Cruz, 2003).

The conditions set by the SEMARNAT include the following: the Santiago river must be cleaned prior to filling up the reservoir; alternatives must be presented to prevent the leachates from the Matatlán landfill from filtering into the dam; it must be guaranteed that the sediments in the future dam are clean; flora and fauna species must be rescued and relocated; a outflow from the dam of $2 \text{ m}^3/\text{s}$ must be guaranteed to secure the health of species downstream; all mitigation and compensation measures proposed by the developer must be implemented.

It is important to notice that the EIA resolution is dated 27 October 2003, whilst the PHR, dated June 2003, already states that Arcediano is the selected project for the supply of water to the MAG. This fact clearly shows that EIA is not being used as a tool in the planning process, but merely as necessary paperwork over decisions already taken.

Discussion

The planning process that led to the decision to build the Arcediano dam has several shortcomings when viewed in the light the frameworks of Sustainable Development and Integrated Watershed Management which the Mexican government pursues. Note that this paper does not make any judgements on whether the Arcediano dam is the best alternative to supply drinking water to the MAG or not; its focus is on the planning process.

Sustainable Development is primarily about development that considers the economic, social and environmental dimensions on a par. This implies that a plan or programme must be the outcome of a planning process that identifies sectoral needs and addresses them in the best possible way such that economic growth, social development and environmental protection and enhancement are guaranteed. In making any trade-offs in the process, these should be documented and justified, and all parties involved held accountable for their decisions.

In this particular case study and looking only at the stages from the identification of alternatives to supply drinking water to the MAG and up to the decision to build the Arcediano dam, economic criteria were clearly dominant over the environmental and social dimensions. The analysis of the 53 alternatives was made based only on cost and time of delivery; even the selection of Arcediano over Loma Larga was based exclusively on economic criteria (and technical feasibility). The environmental dimension did not come into play until the final project was selected (Arcediano) and had to go through a project-level EIA in order to identify mitigation measures.

The government's objectives of achieving sustainable development will never be met if planning processes are allowed to be dominated by economic objectives exclusively.

Integrated Watershed Management, as a tool that ensures the integration of all aspects relevant to a watershed (social, physical, environmental, cultural, economic) in order to achieve more efficient water use, prevent the implementation of conflicting sectoral initiatives, and aim at reaching sustainable development of the watershed, is currently non existent in Mexic o. The establishment of Watershed Councils are not sufficient to guarantee the representation of stakeholders, nor have cross-sectoral cooperation mechanisms been put in place.

The formal water planning process as described in the law is not reproduced in practice. The PHN and the PHRs seem to be compilations of decisions already taken and which were based on particular contexts, not responding to the wider watershed dimension. It strikes to notice that the immense majority of the documents produced in the process to find a source of water for the MAG do not make any reference to the PHN or the PHR. This is not surprising when the PHR clearly refers to the Arcediano project as the final decision for the supply of water for the MAG, at a date when the EIA process for the project had not been completed.

The planning process for the supply of water to the MAG did not respond to the Integrated Watershed Management scheme. The wider watershed dimension (e.g. making the irrigation systems more efficient) was not addressed at any point of the planning process, in which by the way, other authorities from the rest of the watershed were not involved.

The PHN clearly and correctly points out that solutions must give priority to demand management and making existing supply more efficient, over the construction of large infrastructure projects. This policy guideline was completely omitted in this process; not only were large infrastructure projects aimed at increasing the supply of water for the MAG the only alternatives studied, but elements related to demand management and making existing supply more efficient (e.g. by repairing the water distribution system which currently has losses of over 40%) were never considered as part of the solution.

Public participation, transparency and **accountability** were seriously absent in the planning process. Although there was certainly a call for the general public to present alternatives, this was the only opportunity for public involvement in the planning process (notice that the public consultation of the EIA for Arcediano is not considered in this analysis, as this takes place when a final decision has been made on a project and thus cannot be considered part of the 'planning' process). After alternatives were presented, the rest of the decision making process up to the decision to build Arcediano was closed to public scrutiny.

Watershed Councils did not play a role in this planning process, and even if they did, their structure and lack of experience would not have allowed an efficie nt participatory process to develop.

The evaluation process was not open to public input (e.g. definition of evaluation criteria, definition of alternatives to be studied in greater detail, scrutiny of the assessment process) and the final reports were notmade publicly available at the time they were prepared.

Arcediano as a project should be clearly framed in a wider watershed management (regional/sectoral) dimension. Many of the criticisms that the project has received concern issues that are best dealt with at a more strategic level; planners and stakeholders should not have to wait to reach the project level (Arcediano dam) in order to start looking at the potential environmental and social impacts of the projects that for part of a plan/programme.

The potential role of SEA

SEA has the potential to effectively integrate the environmental dimension in the planning process, by identifying and evaluating potential environmental impacts of alternative schemes to achieve stated objectives, as an aid to help achieve planning in a framework of sustainable development.

In the case of water planning in Mexico the government claims that alternatives were indeed addressed at a strategic level, through participatory processes. In the case of Arcediano it was claimed that alternatives were openly defined by the wider civil society through a call for proposals.

The above reasoning encounters several obstacles which prevent it from being a planning process that effectively integrates the environmental dimensionat the plan and programme level.

- 1. To begin with, proposed alternatives should not have addressed only projects that seek alternative sources of drinking water for the Metropolitan Area of Guadalajara, but look into the wider watershed dimension. In the case of Arcediano the only alternatives studied in greater detail were restricted to the construction of dams on the Verde River, without integrating other measures such as demand management and making supply systems more efficient.
- 2. The environmental dimension was not addressed in the planning process on a par with the economic dimension. An adequate integration would have required that potential environmental impacts be assessed in the planning process, not only through general consultation with stakeholders. SEA is an effective tool to address. An SEA could have identified that an alternative may have been to use the available economic resources in implementing more efficient irrigation systems in the agricultural sector as well as carrying out works to minimise the over 40% of losses from the groundwater extracted to supply Guadalajara. The above mentioned actions could possibly help meet the objective of guaranteeing the health of Lake Chapala. These analyses however, were not undertaken.
- 3. The assessment process must be truly participative, transparent and accountable, which is currently not the case. In the wider water planning process Watershed Councils are much politicised entities which are not independent, in spite of having representation from stakeholders. They are chaired by the CNA so they cannot guarantee impartiality, and not all represented groups have a right to vote.

In the case of the supply of water to the MAG Watershed Council were not involved in the planning process. The only opportunity for participation was the call to present alternatives for the supply of water to the MAG, but opportunities for participation were stopped there; the definition of the analysis criteria, the consolidation of alternatives and the analysis and selection of alternatives was undertaken behind closed doors, and decisions not justified.

- 4. In line with transparent processes, all key documentation must be publicly available without restrictions. This is not the case in Mexico either. The comparative analysis of the 53 alternatives were not made publicly available (only the list with the names of the projects was distributed), and even the EIA itself for the Arcediano dam was a document that was practically impossible to get hold of (it was made available in SEMARNAT's offices in Mexico City, when the project concerned the State of Jalisco).
- 5. Not only must key documents be publicly available, but decision making processes must also be accountable. The government must justify why it took the decisions it

did (e.g. in rejecting 51 of the 53 proposed projects) and allow for a right to appeal (access to justice).

Transparent, participatory and accountable SEAs will also help dissipate doubts with regards to the honesty and integrity of politicians, or point them out if such personal interests do exist, so the judicial system may be triggered at the early stages.

Other planning processes: the Puebla - Panama Plan

This paper illustrated the case of the watershed planning process in Mexico, seen through a recent controversial project. Watershed planning was chosen for its evident links to the environmental dimension, but the need for environmental assessments at a strategic level is relevant to all planning sectors.

The Puebla Panama Plan (PPP) has as a general objective the integration and economic and social development of the Mesoamericanarea, which integrates eight countries, and was initiated on 15 June 2001. It was not until 2003 that the "Mesoamerican Initiative for Sustainable Development" (MISD) was agreed through a Memorandum of Understanding (MoU), which will serve as a framework to ensure sustainability across all sectors covered, in order to "ensure that all projects, programmes and initiatives of the PPP incorporate adequate environmental management practices and promote the conservation and sustainable management of natural resources" (IADB, 2003). The MoU that agrees on the MISD considers SEA as a tool to "assess the synergic and regional effects of the different plans, programmes and projects of the different initiatives of the PPP in order to identify and propose the environmental and sustainability considerations as well as for the reduction of risks that must be incorporated transversally".

However to date no SEAs have been undertaken in the framework of the PPP. As well the terms under which such SEAs are to be carried out is not clear, as no transparent SEA procedures and requirements have been defined.

Considering the large number of projects that are to be developed under the PPP it becomes of vital importance that potential environmental impacts are looked at from the plan and programme stages, before specific projects are defined. This has not been the case so far, and this tendency will reduce the effectiveness of environmental assessments which may be undertaken at the project level.

Central American countries as well as Mexico should seriously consider the implementation of SEAs for the different PPP development initiatives. In order to ensure the effectiveness of such SEAs it is important to clearly agree and define SEA procedures and practices in line with international best-practice. These should include adequate participatory mechanisms, access to information, transparency in the decision-making processes, the definition of the stages at which SEAs are to be developed, and quality criteria. It should not be possible to define detailed projects (as it is now the case) before plans and programmes are assessed.

Conclusions: the role for SEA in Mexico

Mexico is on the right track in promoting legislation and policy guidelines that recognise sustainable development and promote the integration of the environment and

public participation in the planning processes. These good intentions are, however, not put into practice. Sustainable development is becoming a void concept, the environmental dimension is not addressed until projects have been defined and public participation remains incipient and inefficient.

SEA is a potentially useful tool to bring the environmental dimension to the forefront of the planning process, on a par with the economic dimension. For this to occur SEA must be understood as an integral element of the planning process, and not be merely applied to already decided plans and programmes, as it is currently the case with EIA at the project le vel. SEA will allow the definition of plans and programmes that make more efficient use of available resources and with minimum environmental impacts. Effective SEA would be supported by the implementation of already defined policy principles, such as seek ing demand management and making supply infrastructure more efficient prior to building large projects to increase water demand.

However for SEA to be implemented efficiently it is crucial to have effective public participation. For this to occur it is important not only to make the necessary legal provisions, but also to motivate civil society and trigger a change of administrative culture towards the recognition of the benefits of participative practices.

Mexico is a consolidating democracy with considerable deficits in two dimensions relevant to environmental integration: social democracy and pluricultural democracy. By social democracy the author mainly refers to an incipient civil society, having implications for the effectiveness of participatory SEA systems. Thus, SEA in Mexico must actively encourage participation of civil society, but must also show that planning processes are truly participatory, i.e. that civil society has a real voice and impact in decision-making. For this to occur, transparency and accountability in the planning process are vital.

With regards to deficits in pluricultural democracy the author refers to the inadequate recognition of the rights of indigenous peoples and their integration in decision-making processes. This is a difficult aspect to solve, but mainly adequate mechanisms must be developed in order to integrate the voice of indigenous peoples in the planning process, through legitimate representative groups.

Apart from these two dimensions Mexico must overcome its still dominant technocentric planning processes, which disregard the environmental and, to a large extent, the social dimensions, based on plan-making on technical feasibility and costs.

It is important to start implementing SEA in the context of the PPP and use this experience to identify the factors that are allowing a good integration of the environmental dimension in the planning process and helping reach better decisions, as well as those factors that are preventing SEA from being effective. Such a study would provide the elements to start working on an SEA scheme that responds to the needs and reality of Mexico.

References

Castelán, E. (1999). *Los Consejos de Cuenca en el Desarrollo de las Presas en México*, Third World Center for Water Management, Mexico, paper prepared for Thematic Review V.3. "River basins-institutional frameworks and management options" as a contributing paper to the World Commission on Dams.

Castelán, E. (2000). *Los Consejos de Cuenca en México*, Seminario Internacional sobre Asignación, Manejo y Productividad de los Recursos Hídricos en Cuencas, International Water Management Institute, Guanajuato.

Castro, L. and Maguey, C. (2003). Critica chiquillada el 'sí' a Arcediano, *Mural*, 27 October.

CEAS – Comisión Estatal de Agua y Saneamiento (2004) *Arcediano por Chapala, Agua para Guadalajara y su Zona Conurbada*, Powerpoint presentation, February.

Centro de Evaluación de Proyectos (2002) *Evaluación Socioeconómica, Alternativas de Abastecimiento de Agua para la Zona Metropolitana de Guadalajara: Presas de Arcediano y Loma Larga,* Universidad Autónoma de Guadalajara, Guadalajara.

CNA - Comisión Nacional del Agua (2004). Sistema de Información Geográfica del Agua, Mapoteca Digital Nacional, online: <u>www.cna.gob.mx</u>, consulted 09.01.2004.

COWI, Scott Wilson and ECA. (2004). *Evaluation of Approaches to Integrating Sustainability into Community Policies*, final report of a project undertaken for the European Commission Secretariat General.

Durán, J.M. and Torres, A. (2001) Crísis Ambiental en el Lago de Chapala y Abastecimiento de Agua para Guadalajara, *Carta Económica Regional*, **14**(78): 9-18.

Grupo Interdisciplinario de Análisis (2002) Análisis de Factibilidad de Alternativas para el Abastecimiento de Agua a la Zona Conurbada de Guadalajara, Síntesis Ejecutiva, Enero.

Gutiérrez-Nájera, R. (2003). Coinciden que presa afectaría ecosistema, *Mural*, 27.10.2003.

Hernández, S. and Cruz, O. (2003). Validan a Arcediano, ponen condiciones, *Mural*, 28.10.2003.

IADB – Interamerican Development Bank (2003). *Aspectos Ambientales*, consulted online at <u>www.iadb.org/ppp/pppambiental.asp</u> on 17.12.2003.

Mural (2001) Antes contrincante, ahora colaborador, Mural, Guadalajara, 20.05.2001.

Mural (2003a). Se opone Greenpeace a presa de Arcediano, *Mural*, Guadalajara, 25.11.2003.

Mural (2003b). Las dudas de Arcediano, Mural, Guadalajara, 23.11.2003.

Palerm, J. and Aceves, C. (submitted). The Dynamics of EIA in Mexico: an analysis from a 'consolidating democracy' perspective, *Impact Assessment and Project Appraisal*.

Palerm, J. and Richardson, J. (2002). *Land Use – Exploring the Scope for Action at the EU level*, final report for a project undertaken for the European Commission Directorate-General Environment, under contract with ECA, S.A.

PVEM – Partido Verde Ecologista Mexicano (2003). El Gobierno de Jalisco Justifica la Construcción de una Presa, Violando Normas Ambientales: PVEM, *Boletín Senado*, 22.05.2003, consulted online: <u>http://www.pvem.org.mx/2003/mayo03/senado.htm</u> on 12.12.2003.

Peniche, S. (2003). *Alberto Cárdenas, la Presa de Arcediano y el Síndrome de Dau*, Centro Universitario de Ciencias Económico-Administrativas (CUCEA), Mexico, consulted online:

http://web.cucea.udg.mx/files/print_page.php?pagina=/topico/index.php?p=17 on 12.12.2003.

Sheate, W.; Dagg, S.; Richardson, J.; Achemman, R.; Palerm, J.; and Steen, U. (2001). *SEA and Integration of the Environment into Strategic Decision Making*, 3 Volumes, final report of a project undertaken for the European Commission DG Environment.

SIAPA – Sistema Intermunicipal de Agua Potable y Alcantar illado and CNA (2002) Presentación de la Situación Actual y Futura del Abastecimiento de Agua Potable a la Zona Metropolitana de Guadalajara, Powerpoint presentation.

Tortajada, C. (2001). *Environmental Sustainability Water Projects*, Doctoral Thesis, Division of Hydraulic Engineering, Department of Civil and Environmental Engineering, Royal Institute of Technology, Sweden.