

SEA Case Study: Water and Sanitation Sector, Energy Sector and Regional Transportation in Colombia

by Juan Quintero

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In the National Development Plan of 1994-1998, key sectors were identified to mainstream environmental issues in Colombia. Two of the sectors were water and sanitation and the energy sector.

I will start my presentation by analyzing and presenting to you the experience of applying Strategic EA processes to the reforms of these two sectors, and then, there is a little case study that I would really like to present in these Strategic EA courses that has to do with how a Strategic EA changed the project concept at the regional level and changed the policy of transportation in rural areas in Colombia.

I will start with the water supply and sanitation sector, and then I will go into greater detail on this one, and then I will highlight some of the most relevant findings and conclusions of the other two case studies. I will not go into detail on the process and the findings. And I will immediately go to Section 4 of this presentation and highlight the lessons learned from the application of these tools, Strategic EA tools, to these sectors.

The first case has to do with the reform of the water and sanitation sector in Colombia. This was a Bank-financed program, and in our conversations with the Government and in taking into consideration the priorities of mainstreaming environment in this sector that was established in the Development Plan, we promoted and assisted the Government to develop a Strategic EA process for this sector which really changed the way the whole sector was reformed in Colombia and is still being implemented.

I will start by highlight what are the three major issues that were identified as priorities for the sector. One is environmental pollution; two, which we had some data, but it was not too clear, was an efficient use of water; and three was the urban and rural impacts from water resource development.

The externalities for environmental pollution, the Strategic EA identified links with public health, recreation, agriculture and industrial pollution, and natural ecosystems. I am just going to highlight the findings of the SEA only on public health.

For instance, the incidence of waterborne diseases for children under five years in the last seven years in Colombia between 1990 and 1997 was extremely high, which led to an annual cost, according to the analytical work that was done as part of this SEA, of between \$300 and \$400 million of annual cost from these incidences--the lack of potable water, bacterial pollution, inadequate hygiene habits were really having a huge social and economic cost in the country.

The second issue was inefficient use of water. The study identified that the unaccounted for water, the physical losses and losses in the entire system and the production system, averaged more than 45 percent of all the potable water that was produced, with losses that reached around \$370 million for 16 of the main cities in Colombia. Again, this wastefulness because of user habits, the lack of awareness in uses, the lack of micro monitoring, and the lack of a sense of the value of these losses, was creating large economic costs for the country, around \$400 million a year, just counting the losses in 16 of the major cities in Colombia.

And the third issue was that since we were wasting so much money, we had to go more and more farther from the cities to bring more water, causing impacts on ecosystems for water projects, and--this came out from the consultation with the communities and city planners--the construction in cities for the expansion of the water supply systems was really causing tremendous aesthetic impacts and quality of life impacts in the urban areas.

But beyond the environmental issues, the analysis of the institutional and regulatory framework of the sector identified some key issues that I would like to highlight.

One, the environmental capacity--and this is what my colleague mentioned--was very weak. There had not been any effort really to mainstream environmental in these key economic and social sectors.

The accountability and the line of authority for the sector were very unclear because of the overlap of functions between the environment, health, and development ministries. The enforcement functions also were unclear. The water and sanitation companies didn't know whom to report to. And also there was--something that Ernesto mentioned--the lack of clear mechanism for inter-institutional coordination.

I think that also I want to highlight that the Strategic EA found that the water supply and sanitation services model that was being implemented had created some degree of confusion among the municipalities, and the municipalities who had been given the responsibility for water supply and sanitation really had not given the assistance to assume that responsibility in an efficient manner.

We also found that the sector, in spite of the findings of all these linkages to health and to ecosystems and to economic costs, had given very little or marginal attention to environmental concerns.

At the policy level, the SEA also found that the whole regulatory framework and policies were really inefficient, and to put it lightly, were lacking. I think that Ernesto mentioned that for the last 30 years, the entire environmental regulatory framework had had a bias toward the green

issues, and very little attention had been given to urban pollution, to urban environmental issues and water pollution issues.

So I think this really ratified the findings of the Strategic EA that were carried out for the preparation of the National Development Plan in 1998, that this bias toward green issues had left aside the regulatory framework and hence the institutionality for urban pollution issues for the brown agenda.

For instance, the SEA found that there was no regulation promoting or providing incentives for efficient water use or the reliability of water and sanitation services or promoting appropriate technologies in the country; there was no way to assign an economic value to water, and there was nothing related to pollution taxes, for instance, in the country.

The options that the Strategic EA analyzed were several, but I think that I want to highlight some of the key findings. One, definitely--and this is something that the Government in the last five years has been pursuing--the country needs to increase the coverage of water and sanitation services. We cannot really do much about advancing the sector if we cannot raise the level of water supply coverage and sewerage collection in the country. So this became the priority for the sector, and all the policies that have been put in place since then, since this Strategic EA, are going in that direction.

Also, the institutional strengthening was not only needed in the public sector but also, the private sector that was coming in to meet some of this demand for the services needed to be part of this institutional strengthening.

The SEA also found that there was a need for more incentives, more policies, to promote water-efficient technologies in the country because of the wasteful habits. The water industry, or the water equipment, were not promoting water-efficient equipment in the households or in the industry, and there was a need to promote economic instruments to adopt more water-efficient technologies.

Also, the SEA clearly defined that there was a need to clearly differentiate the role of the state as a regulator and promote private sector participation to meet the huge demand to increase that coverage. The deficit in water services and the coverage of water and sanitation was so staggering that there was no way to meet that demand unless private sector involvement came into place.

Also, this lack of environmental attention led to the recommendation that there was more need to prepare guidance or guidelines for environment for the sector.

I think--and I want to stress this--the Strategic EA is a process, and at the end, in the last presentation on the section, Ernesto will talk about the feedback loops that have to be put in place for the Strategic EA at the policy level. However, something concrete has to come from this exercise, and we call them "action plans," but you can call it whatever you want--but there have to be some really specific actions stemming from the Strategic EA exercise, and the Strategic EA for the water and sanitation sector in Colombia was a tool, really--the action plan

that was proposed was a tool and is still a tool that is being used to promote the consolidation of the reform that is being implemented by the Government.

For instance, in the last four years since the Strategic EA, there has been a major change and promotion of new and an improvement and modification of the environmental regulations for the sector. The EIA, or the Environmental Impact Assessment process, has been streamlined for the sector. We needed to have more water projects, more sanitation projects, so the Environmental Impact Assessment procedures and licenses were streamlined.

The private sector was coming in, and there was a need to define the environmental responsibilities of the private sector coming in to provide services for water and sanitation. And there has been a major effort, and right now the country has sectoral guidelines for the design, construction, and operation of water and sanitation projects that has really put environment into the whole process of designing construction and operation of these systems--and an institutional strengthening process that was put in place. Let me clarify that when this was done, the water sector was under the Ministry of Development, and now, in the last year, the new Government has even gone further into the mainstream of environment into the water sector, and now the water sector is under the Ministry of Environment itself.

So all in all, the focus of the Strategic EA is let's have clear rules of the game for the institutions, for the private sector, for the environmental institutions, for the regulators, and we need regulations, we need institutional strengthening, we need to define service standards, we need to promote the conservation of water resources, we need to really promote mechanisms to assign water rights between water supply, potable water, irrigation. We need to have clear standards of potable water quality, and as Ernesto also mentioned, we need to increase community participation and make environmental education at the community level. For instance, at the end of the slide, you can see there is a campaign right now in Colombia for hand-washing promotion which the SEA identified. Even beyond the coverage of water supply, hygiene habits had more incidence in the rate of waterborne diseases than the lack of potable water itself. So this was a strategic option to go into the promotion of hygiene habits among the population as a key strategy to decrease the rate of waterborne diseases in the country.

The second case study, very quickly, was done for energy sector reform in Colombia, but I just want to highlight something that came out and that has really changed the way that business is done in this sector.

A Strategic EA was done with the same process, with stakeholder consultation, with linkages, et cetera, et cetera, but what came out which really is relevant and I want to highlight in this presentation is that the SEA proposed a new model for the expansion of the electric power system in Colombia.

This new model is based on the inclusion in the cost equation of all environmental externalities. The old model was an economic-based model where you have a fixed demand, you propose an expansion plan to meet that demand, you have alternate options to meet that demand, and you estimate the financial and production costs, define an internal rate of return, and then you generate income and profits which will influence tariffs.

However, with the Strategic EA, Colombia started incorporating [alternative mechanisms?--JS] with conventional or traditional mechanisms, including environmental concerns in the model. For instance, at the thermal electric plants, they started including issues like air pollution, water pollution, hydroelectric reservoir sanitation. Just to give you data in Colombia, 50 percent of environmental license or the EIAs that are carried out in the country, 50 percent of those are within the energy sector.

However, the Strategic EA then proposed a new model, an alternative model, which includes not a fixed demand, but it includes strategies such as demand side management to really manipulate different demand projections, because through the demand side management, included the cost of alternative energy sources, especially renewable energy, included liabilities of environmental impacts the costs of production of the energy, and then, you include all those costs, you generate your income, but you also have a feedback loop through the community--the influence of the prices of these tariffs on the consumers, and you go back and improve your model.

This is a very simplified way to put it, but it really has changed the way that business is done in the sector. I just want to give you two cases.

This is a real case of a hydroelectric plant that was built in Colombia in 1996, 1997. They were trying to sell it. They were trying to give it in concession to the private sector, and the estimate was based on firm energy of such-and-such, how many gigawatts per hour, with a spot price of \$1.75, et cetera, and they put a rate of return on this. They came out with a worth of between \$150 and \$200 million.

However, when you count the environmental liabilities, the environmental plan, compensation plans for indigenous people who were displaced, and the administration of those liabilities, the cost of managing all those liabilities came out to around \$150 million.

So really, the net worth of that hydroelectric plant in the best scenario was only \$50 million, and in the worst scenario, really, you have to pay the private sector guys to come in and operate this system.

The second case is an electric distribution company in the city that, according to the economic analysis, had a net present value of \$24 million. However, this company had about 22,000 transformers, of which 11,000 transformers contained PCBs. And when you discount the management of these liabilities, managing the PCBs, sending them to appropriate disposal sites in Europe, for instance, this provided a net present value of those costs of around \$70 million, and really, the real value of that company was only \$7 million.

So really, the new model provides the framework to include environmental liabilities, environmental impacts, and environmental liabilities in the business, and this is the way the business is being done in Colombia.

The third one is a case study that is very dear to me, and this case study or this Strategic EA stemmed from a proposal from the Government of Colombia for the Bank to finance a highway,

a major highway linking two national roads that would go through the Mompox Region. This was under the Roads for Peace Program that was being implemented by the previous Government, and this was seen as a way to jumpstart development in this area.

This area of Mompox--and we'll show you some pictures later on--is very complex from an institutional point of view. There is a confluence of five departmental jurisdictions and many other institutional complexities. It is a major area for geopolitical violence in Colombia, for guerrilla insurgency. But also, it is the major, most important wetland ecosystem in Colombia. Eighty percent of the freshwater fisheries in Colombia come from this wetland area. It has a high value for biodiversity, and it is being proposed as a RAMSA site. In addition, the capital, or the urban area in this municipality is a World Heritage Site for great cultural value.

And finally, the communities living in this area are among the poorest communities in the country.

So I will just show you the slide you are seeing--on the Colombia map, it is right in the confluence of where the three major rivers in Colombia come into this wetland area. Mompox was a major port on the most important river in Colombia called the Magdalena River during the Spanish era up to the 1800s. It was a major port. However, 200 years ago, the river decided to change course and turned the city into an island. Ships can no longer go along that branch of the river, and the port lost its importance.

So this is Mompox. I'll also show you some pictures of the city. On the right-hand side, you can see the Colonial architecture quite intact for the last 400 years. It is now just as in the Spanish period. You can see in the lower right-hand side the wetlands of Mompox. And the only contact of this mainland island to the rest of the country is through river transportation.

The Strategic EA was very difficult to exercise. We could find an NGO that had for the last 10 years been managing a protected area in the Mompox Region, and through them; we could not carry out the Strategic EA because of the conflictive situation of the region. We couldn't really do a conventional study there.

So the SEA was based on a stakeholder analysis which identified communities, major landowners, the NGOs that worked in the region, local institutions--I talked about five jurisdictions. This NGO carried out a community-based priority definition exercise at the community level. And they identified the linkages between the physical, biological, social, economic, and cultural values of the area with economic development.

The main findings--and this came as a surprise to everybody--of the whole exercise, the Strategic EA, were, one--and this came as a surprise to the Government--that land transport was not a major priority for the local communities. So the idea that a major highway or a national highway going through the region was going to jumpstart development was not true; the premise was not true, and there was not going to be much benefit to the local communities for the construction of this major highway.

Two, land tenure was identified as the major constraint to development. There were very few landowners that had the best land, and the communities were being pushed toward the flood plains and the lagoons, where they had subsistence agriculture.

There was also an accelerated degradation of the ecosystems, of the biodiversity values of the ecosystem through encroachment by the landowners and by the rural roads that already existed on the island.

Fourth--and this came out also as a major conclusion that changed the course of the project--was that this island ecosystem and this island community had not had direct contact with the mainland, and a connection to the mainland and boom, the rapid growth of the city, could endanger the cultural resources.

And finally, one of the major conclusions was that there was a need to really improve the way that institutional coordination worked in the area, the fragmented institutional coordination and the overlap of several institutions at the municipal, provincial and national levels was a major constraint for development in the area.

The strategic options that were analyzed in the process of doing this SEA were should we connect or not the island to the mainland; should we insist on rural land transport or transform the project into a rural transport project? How can we protect ecosystems in this fragile area when most of the land is in a few private lands? The area is subject to annual flooding. Should we promote more flood control, more flood protection, in the area?

The action plan that came out of here really changed the whole context and the whole approach to the project. The SEA--and it was very heavily documented--was that instead of a highway going through the area, what was needed was a regional development plan based on land tenure security and community-driven development.

Two, there was a need to create--and this is something that the Ministry of Environment has been working on in the last few years--mechanisms and incentives, and there is also a framework to allow and to promote protected areas in private lands.

Three, there was a need to improve river transportation at the local level, including boat landings in the poorest communities.

And there was an urgent need to support the municipality and strengthen the municipality to protect the cultural assets that gave it the title of World Heritage Site.

This came out of the SEA, and I think these are really, the way I see it, the benefit from this exercise. In Mompox and in Colombia, it changed completely the project strategy. I have been in the environmental impact assessment sector for many years, and when you can see that the environmental analysis can change protect design and influence project decisions, it is really gratifying. But this Strategic EA really changed the way the Government was approaching development in this region.

Two, it identified the real priorities for the communities at the local level and at the regional level. It identified the risks, regardless of the project, whether the project was big or not, the ongoing risks for high-value biodiversity and cultural assets and, more important, it established the precedent in Colombia for how to do road development and rural transportation policy. And I think this model of analysis is being used in other regions by the road agency and the Ministry of Transportation in Colombia.

I want to go into a broader discussion of what are the lessons learned from the Colombia case studies that we have presented to you today.

Colombia has had a good experience, a solid experience. Its Strategic EA concepts have evolved during the last 10 years. However, as you can see from Ernesto's presentation and my own, Strategic EAs, regional EAs, have been carried out at the national policy level and to establish regional priorities.

They have also been used for defining something, like the reform of the Constitution of 1991. The Strategic EAs have broadened the analysis of programs, institutions, and organizations, and really, this exercise has really identified to the highest level for governments the linkages between environment, economic growth, poverty alleviation, in a much clearer manner. But most important, the Strategic EAs have placed environment at the core of policy formulation and sectoral reforms.

Also, I am convinced that the Strategic EA approaches have created additional opportunities in Colombia, such as promotion of more institutional coordination and interaction, have raised awareness of the linkages between economic development and environment, as I told you before, have improved the way the government screens or looks at regional or sectoral programs, before the commitments are made, and has helped focus the discussion on the strategic discussions at the policy level rather than the way we have been doing it for the last 20 years, rather at the project-specific level, and has also promoted through identification of institutional strengthening to have much stronger institutions.

However, this tool, the Strategic Environmental Assessment tool, still faces some challenges, and this is an evolving tool, it is a new tool. This is a process, and I think these challenges will take some time to meet, but the country is doing it. For instance, it is changing systemic decisionmaking procedures or processes. This changes with each government, and sometimes when the ministry changes, these procedures change, so you have to adopt the SEA processes to this new and systematic process.

At the plan and the program level, how to do the scoping of the program for the Strategic EA process; how do you do the scoping for this is still a major challenge. And in spite of all the good things that we have presented in these case studies, it is very hard to promote inter-institutional coordination mechanisms. This is still a major issue not only in Colombia but also in many countries in the region. Every institution wants to keep its own institution; they don't share information; they don't want to know what's going on in other sectors.

I think there is also a need to improve the analytical base for these studies that feed into the Strategic EA process. And one thing that really has been a stumbling block not only in Colombia but in other countries as well is that it is very hard to break the culture of the project-specific environmental impact assessment procedures.

Colombia has been doing EIA for specific projects since 1974, 1975, so for 20, 25 years, the whole academic sector, the consulting sector, the institutions, got used to doing specific project-specific environmental impact assessments. So there is a huge culture, a very heavy culture, that likes and feels comfortable doing environmental impact assessment studies for a specific project--for this road, for this hydroelectric plant, for this thermal electric plant, et cetera--and that culture is very difficult to break, and there is lots of resistance coming from different sectors to promote more strategic options to mainstream environmental assessment.

And finally, the public consultation mechanisms--how to improve real participation and informal participation from communities and civil society at-large is still a challenge, but I think that the country, as Ernesto will talk about now, is working on this.

In the last slide, I want to highlight something I said before--that even if this is a process, even if it looks like a loose way of doing environmental analysis, you have to really come up with action plans. In that process, you have to come up with concrete recommendations, be it for exploring demand side management options, exploring fiscal measures, pollution taxes, or strengthening land use planning. But this is part of the Strategic EA process--how you set up a feedback process or a loop for continuous improvement of the policy formulation.

But to do this, you really need to work a lot and strengthen the institutions.