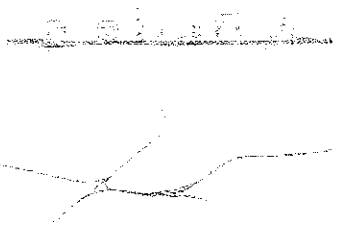
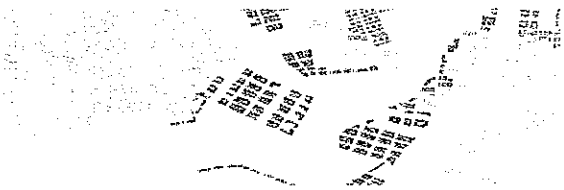
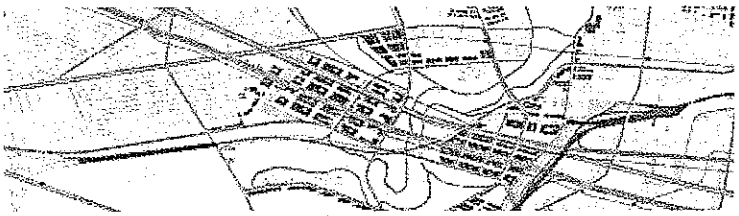
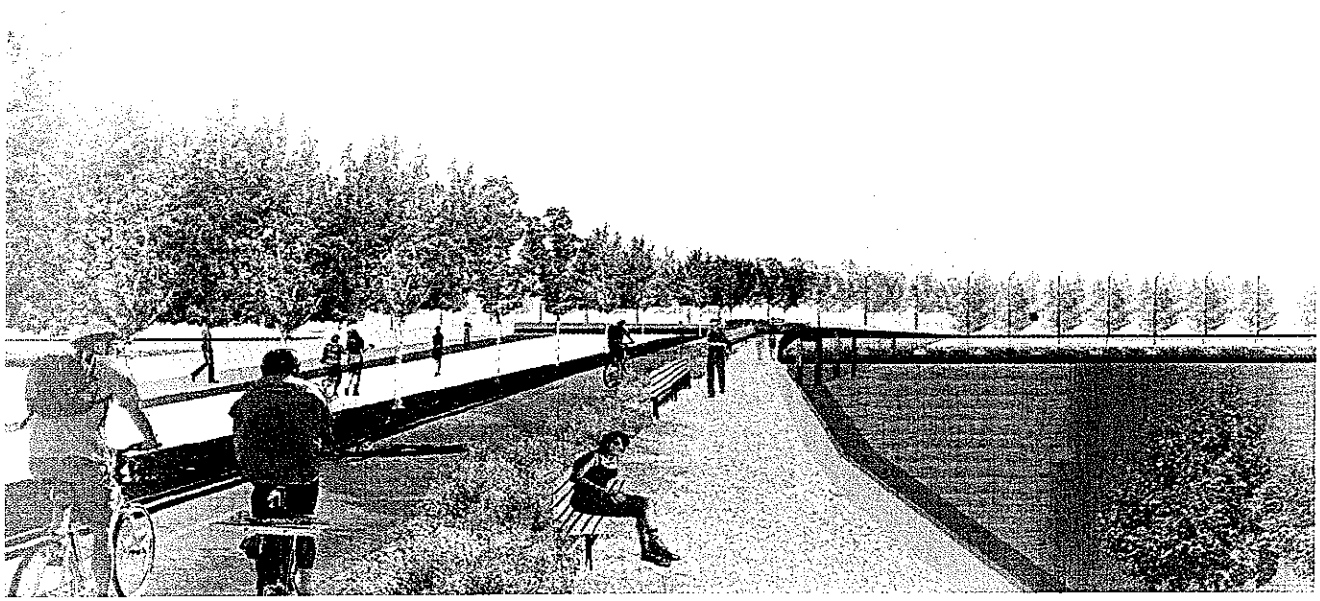
Panorama

Transformations









PLANNING FOR SCALE

PLAN PUEBLA PANAMA AND THE DIQUIS HYDROELECTRIC PROJECT.

By Dan Moscovici & Craig Wenger

Central America is currently engaged in a major, transnational planning effort—Plan Puebla Panama (PPP)—intended to facilitate regional economic integration through a series of large-scale infrastructure improvement and construction projects. Leaders from throughout the region conceived the plan in the context of, and as a response to, the impacts of globalization. They realized that pooling and efficiently connecting resources would be the most efficient means of prospering within this new global structure. Like the European Union before them, new regional collaborative structures such as the PPP are demonstrating to the world that regional, transnational planned growth is essential for the sustainability of a healthy, global economy. Regional planning is now a critical element in this drive to achieve sustainable economic development.

The Diquis Hydroelectric Project, proposed in southern Costa Rica near the town of Buenos Aires, is an important piece of the regional PPP to create energy interconnection throughout the region. The dam will produce energy for millions of Central Americans, but as proposed, it will also cause irreversible local impacts on some of Costa Rica's rare mangrove forests, the river ecology, the indigenous Borucan people, and local Buenos Aires residents. The project is proposed in the name of progress, energy, and international regional development, but this is often at the expense of important local interests. The scale of the PPP is so large that regional decision makers *must* engage with planners at the local level to ensure that existing local assets are maintained as regional infrastructures are built.

Plan Puebla Panama and Economic Integration at the Regional Scale

Plan Puebla Panama is an alternative to struggling international agreements trade integrating the Americas, particularly NAFTA an Mercosur, and aims to successfully implement the Free Trade Area of the Americas (FTAA). PPP covers about 1 million square kilometers and 65 million people in Latin America's eight countries: Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama.

The intent of creating PPP is to develop a free trade area that links these nations. A synergy of industry would bolster individual national economies, major international highways would connect population centers, and cross-boundary infrastructure projects and sharing would generate energy. Initiated by Mexican President Vicente Fox, the underlying goal of the PPP is poverty alleviation. The PPP nations will be closely monitored to see if they can improve their global human development indices— benchmarks of health and prosperity in respect to poverty—as measured by the United Nations Development Programme.[1]

Mexico plans to take the lead and immediately begin construction of "great corridors of highways and railroads, of pipelines and electric lines, of ports and airports," to quickly and efficiently connect all the development zones between Panama and Mexico.[2] The Diquís Hydroelectric Project is the biggest individual project. While not the most significant part of the PPP megaprojects, electrical interconnection (using hydropower) is currently budgeted at 11.1 percent of all funding, second only to highway projects, which is by far the dominant element, constituting 85.2 percent.[3]

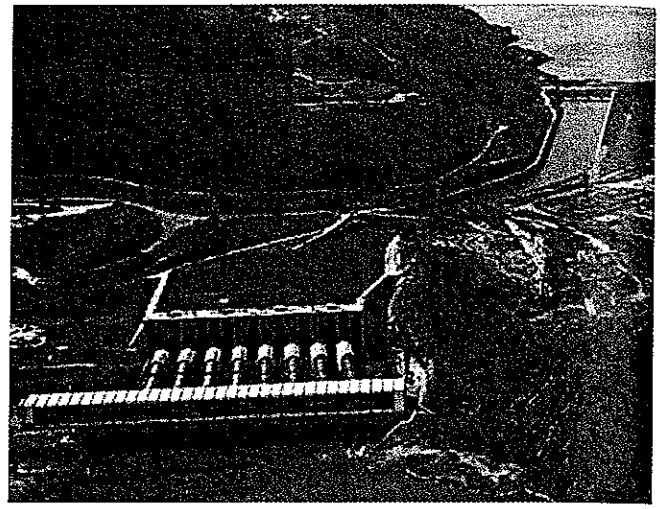
Map of Pan Puebla Panama Countries

Overall, the PPP has major international financial backing, with the Inter-American Development Bank pledging $10 billion of the total $20 billion in project costs. Costa Rica is in the greatest position to spearhead initiation of this regional plan. With a strong eco-tourism industry, a booming computer chip manufacturing sector, and a central location, the country can be considered a keystone for overall development and interconnection in the region. One of the electrical infrastructure plans, known as SIEPAC, seeks to build electrical transmissions lines linking all of the Central American nations. Costa Rica's strategic hydroelectric projects will foremost benefit residents domestically, but will also allow the country during peak demand periods to sell power surpluses to neighboring countries through the improved distribution network.[4]

There is a great opportunity for success of the PPP, but many problems persist. First, planners at the regional level are ignoring significant environmental considerations in construction of the megaprojects. Simultaneous efforts at creating a Central American Biological Corridor have led proponents of the PPP to disassociate any integration of the two proposals because of conflicts over environmental impacts.[5] In addition, individual plans violate country agreements and protection strategies for places such as the mangrove site in Costa Rica called Terraba Sierpe, a Ramsar-designated Wetland of International Importance.[6] Second, and possibly more significant, is the disregard for local decision-making. The presidents of Mexico, the Inter-American Development Bank and the World Bank are the plan's architects. With billions of dollars invested, and politics closely married to outcomes, those leaders have consistently disregarded local-scale impacts and opinions of local residents as insignificant in the regional planning picture.

THE DIQUIS HYDROELECTRIC DAM AND THE LOCAL SCALE

The Diquis Hydroelectric Dam Project is a medium-sized project in comparison to the Three Gorges Dam in China or the Aswan Dam in Egypt. It is nonetheless a major project whose impacts will be numerous and significant, both on nearby residents and on the environment. Grass roots alliances and non-governmental organizations have sprung up to fight for the interests of local residents, including indigenous inhabitants and those living in the many towns alongside the rivers who will be affected by the dam's new reservoir. Environmentalists have spoken up against the future dam's impacts on the local river ecology and the downstream wetland through the creation of a large reservoir. Of course, some activists and environmentalists would prefer that no dam be built—ever. However, many are not fighting to kill the project, but rather to ensure that ap



Example of Hydroelectric Dam. Congo River at Inga Falls

propriate and relevant local planning knowledge and measures are incorporated into the overall plan so that unnecessarily detrimental impacts—to both people and the environment—are avoided.

Ecological Impacts

The plans for the dam and its subsequent impacts have evolved significantly over the years. The dam proposal has been up for debate since the nineteen-seventies and has changed names, specific location, and mediation measures various times. Alternatively known as the Boruca project, the Veraguas-Diquis project, and the El Diquis, today the project is titled the Diquís Hydroelectric Project.[7] The current plan sites the dam on the General River, near the confluence of the Coto Brus River and the Grand Terraba River. The Terraba water basin is Costa Rica's largest basin and the river feeds the country's most significant mangrove forest that lies within the internationally significant Ramsar-protected wetland.[8]

There will be immediate environmental impacts along the General River after dam construction. Once the dam is built, only 10 percent of the river's flow will pass into the pre-existing riverway[9] and considerable habitat above the dam will be engulfed by the new reservoir. A total of 21 kilometers of river downstream will be affected, particularly because of the controlled flow and water releases. This 10 percent, which will also fluctuate seasonally, will not adequately maintain the current ecology of the General. The affected 21 kilometers will experience severe drought-like conditions, putting pressure on the biodiversity. Ultimately, this will cause species within the river to crowd into smaller areas with fewer resources, eventually leading to a reduction in diversity.[10] Unlike the downstream section, the headwaters will experience almost opposite environmental effects

The dam will flood a 6,002-hectare area to form a reservoir that will be utilized to supply the power generators Environmentally, this reservoir will create a massive lentic (still water) system—an ecological biome that does not otherwise exist in Costa Rica, aside from other man made examples at other hydroelectric projects. Species living in Costa Rica's river systems are not adapted to live in an area where there is constantly standing water. Researchers have documented species loss in similar circumstances [11]

In addition, reservoir depths will vary seasonally, creating a new "dust season" in summer. During the rainy season, the reservoir will gain 20 meters in length only to lose it in summer droughts. The vast areas of newly uncovered mud will then dry, creating dust bowls. Buenos Aires is situated 8 miles from this area and, as the name suggests, is a windy region, thus ensuring that dust will become an environmental health issue for many residents of the city.[12]

Intense sedimentation caused by years of silt collecting behind the dam will also become a problem. Farming practices in the higher elevations produce silt that is washed into Costa Rica's rivers during rains. Sediment collects behind dams, which typically open their doors to release both water and silt. However, the dam's large size—it is designed to be 179 meters high—prevents construction from accommodating these kinds of outflows.[13] Therefore, the dam will block all sediment for the duration of the dam's life, which if typical, will be approximately 50 years.[14] After a half century there will be an enormous amount of sedimentation trapped behind the concrete walls, which could lead to flooding, a need to raise the structure, or major issues if the impoundment were ever removed

The flow volume and sedimentation levels in the General River will cause additional problems downstream at the Sierpe-Terraba wetland. The Sierpe-Terraba wetland is fueled by the natural flows of water and sedimentation provided within the Grand Terraba River, which is formed by the General and the Coto Brus rivers. With the creation of the dam, this significant international site will be severely altered ecologically. To provide sediment and constant water flow to the wetland, the Coto Brus will have to maintain its current condition, which will require management by ICE—the power company. This will occur year-round at 100 percent capacity, to maximize energy generation. In doing this, the wetland will constantly be receiving amounts of water equal or surpassing that of the wet season, which will result in a change to the salinity concentration of the mangrove forest, turning it into primarily a fresh water base Species will not be able to survive these drastic changes in the mangrove wetland In order to mediate these biological issues, engineers have planned that the water released will be altered to match flow, temperature, and dissolved oxygen levels of the Terraba [15]

However, as a solution to the mangrove devastation, the El Diquis project could produce at 20 percent capacity in the rainy season, allowing it to simultaneously meet demand and protect the freshwater content of the mangroves.[17] However, to maximize profits the dam authority will most like produce at 100 percent the entire year and sell power to neighboring countries.[18] This is a project component of the Plan Puebla Panama, and the entire Central American region must be considered.

There is no question that Costa Rica needs to increase power generation capacity, particularly during the summer high peak periods. Many power shortages have occurred during the past few years, costing the country's businesses millions of dollars. For instance, in May 2007, the country experienced an unexpected blackout and businesses lost an estimated $20 million If the problem continues, experts estimate that Costa Rican businesses could lose approximately $400 million dollars between 2007 and 2008 [16]

Social Ramifications

Socially, the plan has even greater problems and hurdles to overcome There is a great deal of opposition throughout the country. In the International Human Rights Court (which is located in Costa Rica's capital, San Jose), indigenous peoples' rights and the associated fair market value for the land that will be flooded are of concern. There are essentially two facets to the community-based problems One component of the problem is generated from the indigenous people and the other from the citizens of the eight towns which will be inundated by the reservoir.[19] In response to these issues, ICE has created a taskforce responsible for handling all social conflicts associated with dam construction It is interesting to note that there is no precedent for this type of initiative by ICE in the many years and dams they have built and operated in Costa Rica, suggesting that the intensity of the current conflicts are particularly high.

The indigenous argument is simple; the aboriginal people believe that they own the land and have no desire to sell it or move– their tribes and people have settled these hills and mountains for thousands of years.

The project calls for the flooding of 657 hectares of indigenous land, but there is no component discussing the relocation of affected native persons [20] ICE's social taskforce maintains that the indigenous groups have agreed to the newest plan;[21] however, the natives have continued to hold numerous protests against

the projects. On another front, questions of corruption have surfaced during discussions of land acquisition. Many of the indigenous land holdings have changed hands illegally over the years and now non-native people have purchased the properties unlawfully.[22] Therefore, much of the land ICE needs to purchase for the project is now claimed and owned by non-native persons; so, ICE sees no indigenous conflict

Of the eight towns that will be flooded, 1,068 people will be relocated. Since talks of this project have been around for decades, it has given these people time to prepare themselves for ICE and the negotiation process. As a benchmarking initiative, many of the local town leaders traveled north to the Arenal Dam (a recent ICE hydroelectric project with similar relocation issues) and garnered advice from the residents and grassroots organizations. Learning from the Arenal mistakes, the towns associated with the Diquis Hydroelectric Project have banded together for greater negotiation power with ICE. Known as *Asprodiquis*, or the "Association of the Communities Affected by El Diquis," and formed Sept. 24, 2006, its mission is to learn more about what the dam will bring in regards to tourism, environmental impacts, and community development. In addition, it seeks to ensure residents will receive a fair price for their land.[23] Generally, the region around the proposed project, the southern zone, is one of the poorest regions of Costa Rica.[24]

CONCLUSION

Around the world hydroelectric development plans have many associated environmental risks and pressing social problems. In the case of the Diquis Hydroelectric Project, it is essential that ICE consider the cost-benefit of its actions and ensures that proper environmental management and local citizen fair bargaining occurs. Proper planning at the local scale will ensure that globally unique ecosystems are not destroyed and that indigenous tribes and local people are not displaced or eradicated from existence. Costa Rica can be the leader for sustainability in the Plan Puebla Panama.

We are in an era of globalization, possibly considered a new golden age of knowledge, communication, and culture. However, sustainable development must move beyond construction of roads, dams, and railroads. It must integrate institutions, government, people, culture, places and act as a link between ecology and politics. Proponents of the PPP are on the verge of an exciting and potentially radical plan for improving the lives of millions of people in Central America; however, planners must recognize that globalization shapes the economy, society, and ecology—the triple bottom line.[25]

Costa Rica has cultivated a global competitive advantage through its preservation of diverse ecosystems and the creation of one of the strongest ecotourism markets in the world. Therefore, it is essential that Costa Rica and the Diquís Hydroelectric Project stand as a model for ecological and social planning within the Plan Puebla Panama. With international agreements, such as NAFTA, CAFTA, FTAA, and the PPP, it is essential that Central American countries and agencies work together to come up with effective and visionary plans. However, only if regional planning can move beyond infrastructure development, to social and environmental sustainability, will successes be achieved locally and internationally in this Central American region

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