

SUBURBAN DEVELOPMENT LA SIBERIA LA GALERA (BOGOTÁ), COLOMBIA

VALUE INVESTMENT COLOMBIA (VIC)

BIG Biodiversity Challenge Award category: Large Scale Permanent

Project overview

La Siberia project is a suburban development of 398Ha which will gather 3,500 housing units. The project is developed under a Water Sensitive Urban Design (WSUD) that manages rainwater through bioretention systems, waste water is treated for reuse. Besides, a solar farm of 15Ha will generate 15,000KVA of energy, which supply 25% of the energy loads. 24 artificial wetlands treat the waste water of the project, generating reuse water to provide 32% of water consumption in buildings. A total area of 5Ha is destined for the solid waste transfer station, which allows to do on site recycling, biomass production and to cut transportation costs to landfill.

What were the biodiversity conditions on site, prior to the enhancement?

The site was a quarry mine owned by a cement company that was exploited for more than 20 years. Biodiversity was affected by this activity as it modified the existing topography, vegetation and water sheds.

Also, artificial lagoons were generated which water was contaminated.

Were there any specific conditions that led to you carrying out this work?

The Master plan of the municipality zoned this area for residential activity, offering an opportunity to generate a new planning condition to define a mitigation strategy to recover the biodiversity in the site. To achieve the following, all open spaces of the project are planned and located in the areas where aquifer recharge (according to soil studies) can be fostered and where natural forests could be preserved and enhanced. Artificial water bodies generated by quarry activities were integrated in the master plan open spaces, integrating them to the bioretention storm water system, connecting them to the existing river water shed.



Currently the landscape is dominated by the ruins of the old factory of Cementos Samper, its quarry, unpaved roads and small farms.

What were the biodiversity measures taken?

By applying the WSUD model the natural infrastructure became the backbone of the project. Understanding how the flow of storm water runoff and the areas where aquifer recharge system was possible determine the location of public open spaces. Steep areas with more than 30% slope were restricted for development. Storm water system is managed via bioretention, which was planned following the natural course of the water runoff and using the artificial lagoons. Road, pedestrian and bike systems follow the storm water system. All of these elements conform the open space system of the project, which is connected to the river water shed and protected areas. By integrating again the natural system, the ecological habitat can be restored.

A private utility company was created to provide potable water using storm water and aquifers, generating a self sufficient system. This company is also used as a vehicle to enforce water efficiency in the project by making all water treatment via artificial wetlands mandatory, reuse of water for irrigation and toilets, and rainwater harvesting from roofs in all buildings and developments. Also, parks, street, pedestrian and bike path lighting must use LED technology, and its design will avoid light pollution to minimize impact to the habitat. All buildings must use efficient lighting systems and integrate solar water heating and solar photovoltaic to provide 25% of energy use.



Existing lagoons are used as water reservoirs to provide potable water

What were the biodiversity measures taken?

The integration of the natural open system in the project with the management via the private Utility company is an innovative approach that reduces investment in infrastructure, reduces energy and water consumption, and reduces operation costs, which will be a long term benefit, especially for the management of the Utility company.

Finally, the bioretention systems, the artificial lagoons created and the restoration of natural forests will **recover the natural habitat and hence the site's biodeversity.**

How would you best describe the project?

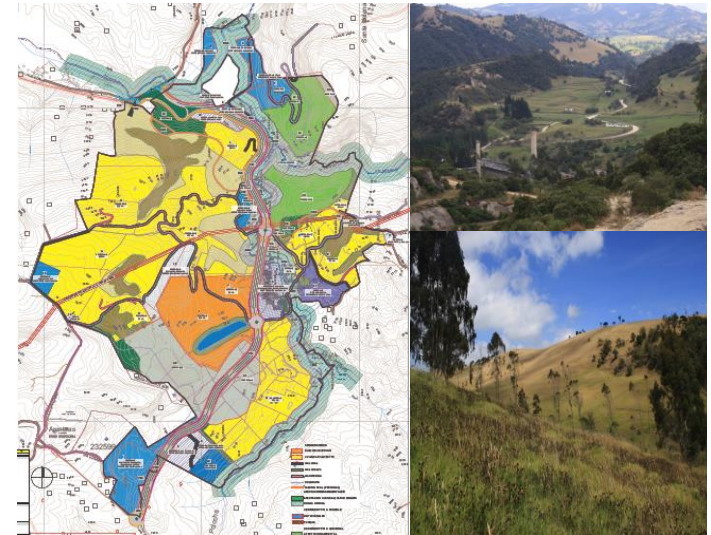
An enhancement to the existing habitat

Further information

The project is a suburban development that will allow aquifer recharge and ensure 100% natural flow to existing rivers and water sheds. Water conservation strategies, including water reuse, reduce 47% potable water consumption in the housing development. The use of bioretention systems and the creation of artificial wetlands for water treatment reduce storm water runoff and waste water by 60%. At least 25% of the energy consumed is generated on site through the introduction of energy efficiency measures and the use of solar panels for energy generation. A waste transfer station reduces on 50% the waste transported to the landfill.

All these benefits are achieved with a 35% reduction in construction costs in the hydro sanitary network of the project at the urban level.

As the project uses the natural ecosystem as the backbone for the suburban development, the biodiversity will recover, and the impacts of the building use will be minimum. The inhabitants of the suburban development will have reduced energy, water and waste costs when compared to other suburban developments, while the Utility company will ensure long term benefits as it works as a decentralized system.



The Master Plan integrates the natural ecosystem in the urban development

What was your personal motivation for carrying out the enhancement?

There was an opportunity to do a suburban development that considered the habitat and the existing ecosystem as an asset. When studying the site of the project, we understood the need to recover the habitat that the quarry mining activities had deteriorated for more than 20 years.