Quantifying Negative Externalities Avoided in the Extension of the Anchieta-Imigrantes System

EXECUTIVE SUMMARY

Since 1998, Ecovias dos Imigrantes Concessionaire has been operating the Anchieta-Imigrantes System (SAI), a 176.8-km stretch that connects the metropolitan region of Sao Paulo with the Port of Santos – the largest port in Latin America –, Cubatão Petrochemical Complex, the industries of ABCD region, and Baixada Santista seaside lowlands, where over 30 million vehicles cross per year.

Among the concession requirements, the agreement established that Ecovias had to build the descending lane of the Rodovia dos Imigrantes Highway. That lane was launched on December 17, 2002, and the original project, from 1986, was redesigned gaining even longer tunnels and more modern viaducts, which minimized the impacts on remnant native vegetation in this stretch of Serra do Mar mountain chain.

Thus, as a way to understand the avoided externalities, the Concessionaire chose to quantify avoided emissions, comparing areas of vegetation suppression in both project scenarios and its contribution to the Global Climate Regulation Ecosystem Service. Removals were also considered through forest restoration projects.

For this assessment, conducted for the 20-year period granted for the concession, the areas to be deforested in the original project scenario (baseline) were considered, encompassing 1,600 hectares, then compared to the areas that were actually deforested for the construction of the new 40-hectare lane. Therefore, the conclusion was that the concessionaire avoided the deforestation of 1,560 hectares.

It also quantified the emission balance between the 78-hectare suppressed vegetation area (40 hectares for the descending lane and 38 hectares for other interventions) and the 298-hectare restored area. Carbon quantification considered the stocks contained in that phytophysiognomy, and the economic valuation used the Replacement Cost Method through the Social Cost of Carbon (SCC).

Based on the results obtained in the study, there was a positive externality of about 26,000 tCO_2e from removals enabled by forest restoration projects, and about 363,000 tCO_2e from avoided deforestation. Applying the SCC to valuate both, the resulting value is about BRL 49 million.

The valuation project allows for a reflection about the improvement costs in the engineering project, avoided impacts on natural resources, positive externalities and the corresponding benefits for society.

Reporting of Dependencies, Impacts and Externalities

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Project drivers

Goals: Assess risks and opportunities; Communicate internally or externally; Understand the business relationship with ecosystem services.

Description: Valuate the techniques adopted to preserve the environment.

Project scope

Object of the Project Analysis: Project

Description: Valuate the reduction of impacts caused by improvement and extension construction works in the road system that connects the highlands and seaside lowlands of Baixada Santista, as well as in other infrastructure construction works for Anchieta-Imigrantes system management.

Geographic Area: São Bernardo do Campo, Cubatão, Santos, São Vicente, Praia Grande, Guarujá.

Step(s) of the Value Chain Included: Own operations

Type of Approach: Retroactive and prospective

Time Horizon: 20 years

Ecosystem Services: Global climate regulation

Global climate regulation

Role played by ecosystems in carbon and nitrogen biogeochemical cycles, thus influencing emissions of important greenhouse gases, such as CO_2, CH_4 and N_2O.

Method(s) Used: Replacement Cost Method (RCM).

Results:

Externality: BRL 3.3 million for net emissions and BRL 45.6 million for avoided deforestation

Data Used:	Type of Data:
Net Emissions	
Actual emissions resulting from deforestation or environmental degradation, in tCO_2e: 22,116.45	Primary
Actual removals resulting from environmental recovery, in tCO_2e: 77,419	Primary
Avoided Deforestation	
Biome phytophysiognomy and land use: Montane Dense Ombrophilous Forest	Secondary
Area of avoided deforestation, in ha: 1,560	Primary
Deforestation rate considered as base line: 100	Secondary
Deforestation rate with the project: 0	Primary
Avoided emissions, in tCO_2e: 363,654	Primary

Further Information

Exchange rate used to convert the Social Cost of Carbon (SCC), in Brazilian Reais: 3.30.

Assumptions adopted in the valuation estimates: —

Adjustments or derivation applied to the methods and tools used: In a conservative approach, 10% of the value was discounted from the total volume of emissions avoided as project non-performance margin and/or leakage deforestation.

Others: —

Explanatory Notes*: —

Analysis of the results

By conducting the valuation, it is possible to realize how important the project revision and the use of new technologies were, thus avoiding greater environmental impact. With this tool, it is possible to understand the economic value of environmental damage avoided related to deforestation emissions as about BRL 45 milllons and that the benefit from the carbon sequestration is around BRL 3 millions. These values, in many cases, are not accounted for.

Management of ecosystem services

Use of ecosystem service valuation results: Assessment of damages caused to natural resources; Social and environmental impact assessment.

Description: The ecosystem service valuation method enabled the concessionaire to run a diagnosis and directly or indirectly estimate the value of used or preserved natural resources, the interference with the environment, whether due to construction works, demobilization, obstruction of water resources, or actions that affect fauna and flora. Based on this case, it is increasingly clear that the actions adopted by the company after revising its projects can bring significant gains to the ecosystem and to the global climate. It also shows how important it is to continuously invest in the search for innovative, less harmful methods and techniques, from the project design to its final execution, balancing investment costs and ecosystem valuation, so the company can make sustainable decisions.

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