

## Development of a Resource Management Model for the island of Martinique

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### Abstract

**Climate change have already consequences on the quantity and quality of Martinique's available freshwater resources. In the future, without an adaptation strategy, the unavoidable trade-off will have to be made between satisfying water uses with an acceptable price versus respecting the ecology of watercourses and the quality of aquatic environments.**

**However, this trade-off is not inevitable, and solutions exist to reconcile these two objectives. They need to be collectively shared, technically and financially, equitably and effectively, at the territorial level.**

The Resource Management Model is the first hydroeconomic model that was developed in France with the support of French Office of Biodiversity, as a decision-making tool for water management in Martinique. It is the result of a research and development program led by the Water Office Martinique which mobilized the expertise of economists, hydrologists and hydraulics civil engineers.

This model includes all uses of freshwater (human, agricultural, industrial consumption) and involves 3 components: the environment (modelling of water resources), hydraulics (distribution according to uses) and economy (the cost of water). This model aims to optimize the technical and financial management of water resources in order to guarantee uses within resource constraints (compliance with reserved flows). Climate and demographical projections were incorporated into calculations of the availability of the extractable resource.

This innovative model has been co-constructed as a structuring tool for dialogue and projection for all water stakeholders. Different scenarios were discussed and implement into the model for further cost-benefit analysis.

### Modelling results:

1 - Due to rainfall scarcity, the volumes of water available for all uses would be reduced in 2055 by -31% to -75% during dry season.

2 - Demography and operating revenues of services: alert on the financial balance of drinkable water services

3 - Improving network performance is an option in the adaptation strategy, but not enough!

4 - Diversifying sources of supply would improve user service satisfaction at 78% to 95%

5 - The interconnection of primary infrastructure: a cornerstone of the adaptation strategy

6 - RECOMMENDATIONS

- The first results of the “MGR” should allow the development of an adaptation strategy For climate and demographic changes.
- Such a strategy should involve all stakeholders in a concerted process.
- This strategy would have significant benefits in terms of user satisfaction rates and respect for the ecological constraints of watercourses.
- This strategy also has a cost, which must be equitably distributed among users, the citizens of Martinique and the State in a perspective of national solidarity.

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