A Multiscale Integrated Model of Ecosystem Services (MIMES) for Araça bay region, in São Paulo north coast, Brazil.

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PRESENTATION

Assessing Coupled Human and Natural Systems (CHANS) through modelling has recently evolved to spacial and multiscale models (Multiscale Integrated Model of Ecosystem Services – MIMES). Changes on environmental characteristics due to human actions or natural variations and it's consequences on human life conditions and ecosystem support are being addressed by these tools in order to assist public policy development. However, before developing dynamic models it's necessary to identify key ecosystems services (ESs) provided by the environment and its direct beneficiaries. Here we discuss the development of a matrix arranged to support the identification of ESs at Araçá Bay (São Sebastião – Brazil) for further modelling.



Fig. 1. São Sebastião channel and surrounding hydrographic basins.

Araçá is a small bay with hydrodynamic dominated by tides, bordered by rocky flanks, that covers four beaches, three sections of mangrove forests and a soft-bottom plain (Amaral et al, 2010). Araçá, as well as the entire northern coast of São Paulo / Brazil, is immersed in an intense context of socio-economic and environmental changes, as a result of economic growth policies related to energy, infrastructure and logistics.

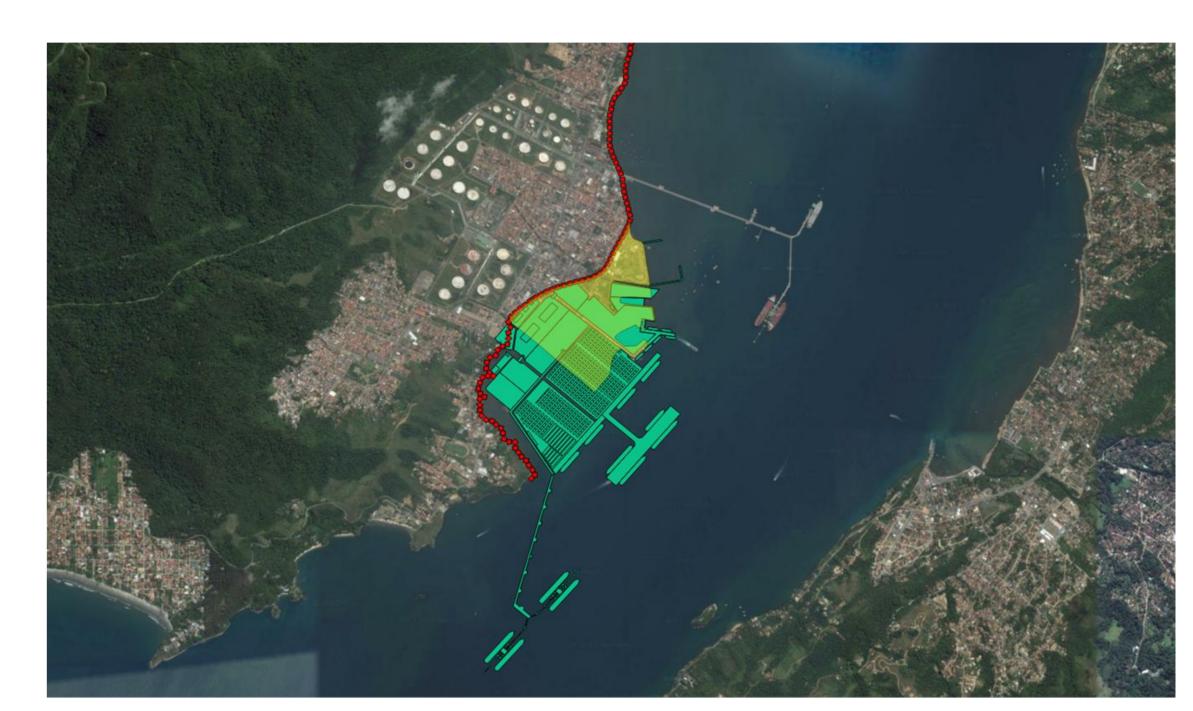


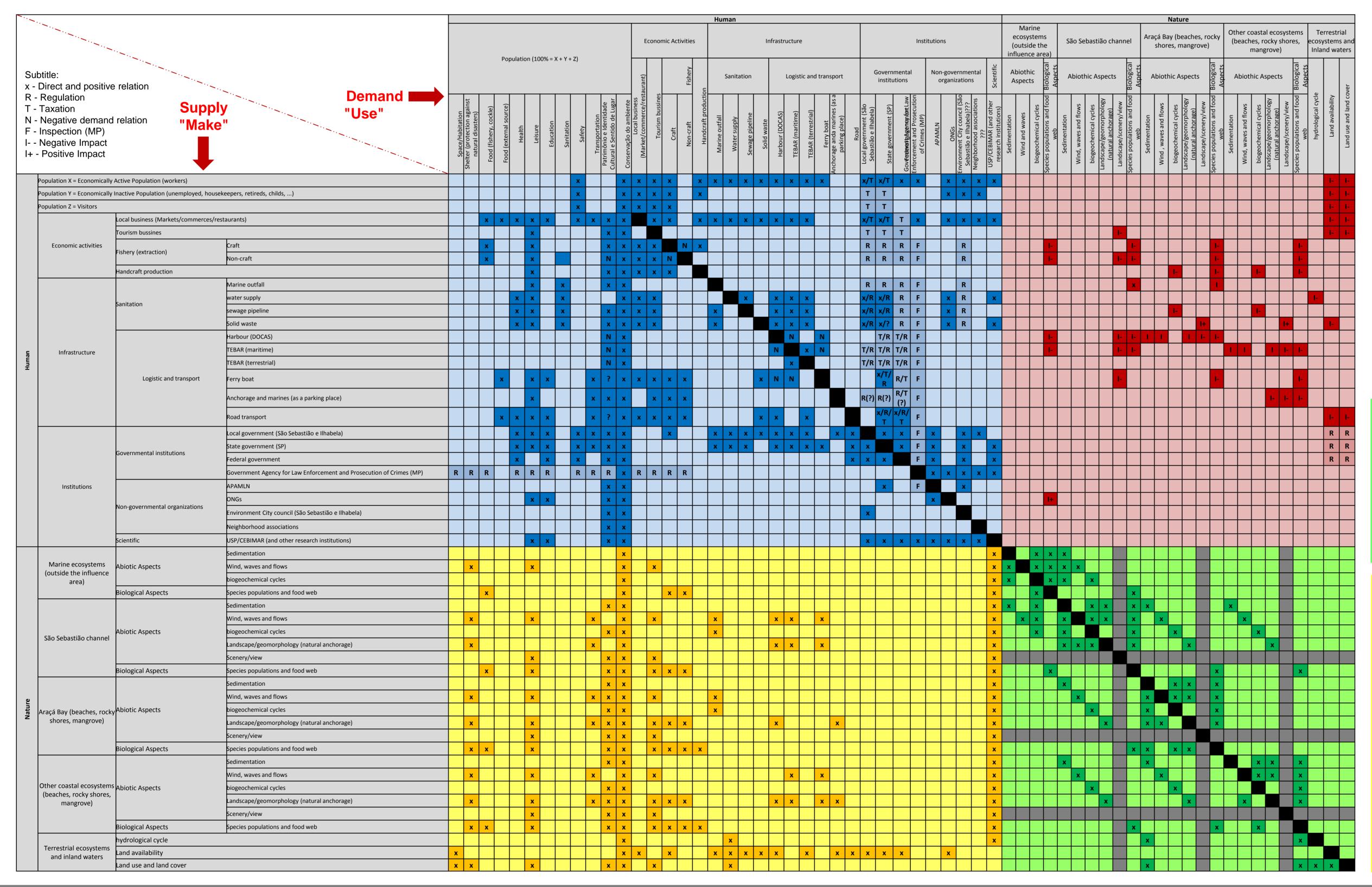
Fig. 2. São Sebastião port nowadays (yellow) and its expansion project (green) predicting to cover 80% of Araçá bay.

OBJECTIVES E METHODS

Identify the ESs resulting from interactions of coupled human and natural systems at Araçá Bay through the development of a matrix within the human and natural dimensions. The ESs identified will be further modeled at MIMES/ARAÇÁ.

Both X and Y axis of the matrix has the same natural (physical and biotic aspects of marine ecosystems, mangroves and land) and human (local economic systems, institutions, population dynamics, and the projects related to infrastructure) components. The specialists who participated on the matrix development assumed that components on X axis demand something from componentes on Y axis, thus, an interaction emerge from this demand and supply relation.

RESULTS AND CONCLUSION



Socioeconomic components that demand from itself, e.g.:
population demands leisure and environmental conservation from all society actors; local business demands labours; tourism demands infrastructure; artisanal fishery demands local business.

Impacts at marine ecosystems were not understood as being as critical as those cause on São Sebastião Channel, at Araçá bay or at their coastal ecosystems

Natural components demands usually from each other on different scales (ecosystem at Araçá bay demands from São Sebastião ecosystem which demands from marine ecosystems)

components from Socioeconomic:
population (need for local services
and resources, space for
construction, leisure and
transportation), economic activities
(tourism, artisanal and nonartisanal fishery), sanitation
intitutions (marine outfall) and
logistic and transport (inland and
oversea)

References: