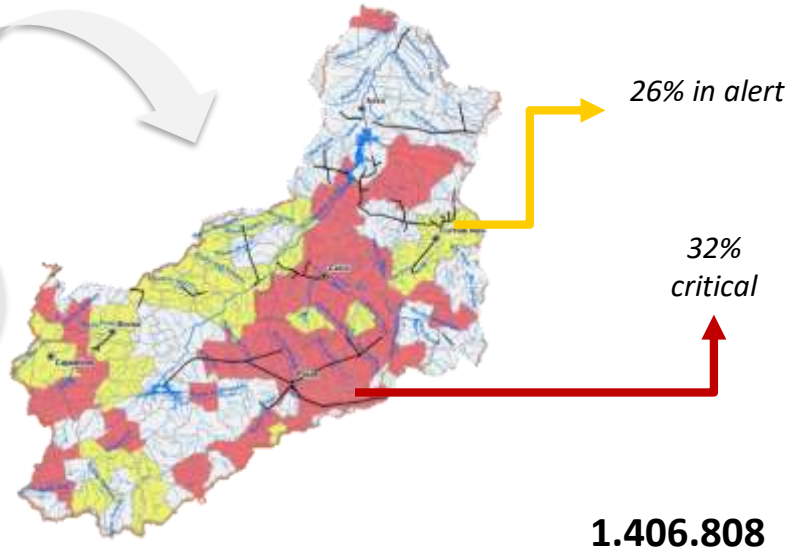
Estimation of the Economic Loss Associated with the Potential Water Scarcity due to Climate Change over a River Basin in Northeast Brazil

Guiding Policy-making Process on a Tangible Scientific Basis

Layla Lambiasi, Researcher at the Center for Sustainability Studies (GVces) of the Business Administration School of Fundação Getulio Vargas (FGV-EAESP)

FGV EAESP
CENTRO DE ESTUDOS EM SUSTENTABILIDADE

REGION OF INTEREST: NORTHEAST BRAZIL



1.406.808 habitants (2010)

- Potential worst CC impacts
- Already at risk (water crisis): severe droughts
- Systems of intermittent reservoirs: All rain drops between February and May
- Rural profile

THE CONTEXT: A COST-BENEFIT ANALYSIS

QUESTION 1 **Where and from what are we at risk?**	Water deficits on a monthly basis for each district of the analyzed river basin
QUESTION 2 **What is the magnitude of the expected losses?**	Economic loss in monetary terms divided by type of user
QUESTION 3 **How can we respond?**	Cost/benefit ratio of each measure

SCALING UP SCENARIO PLANNING

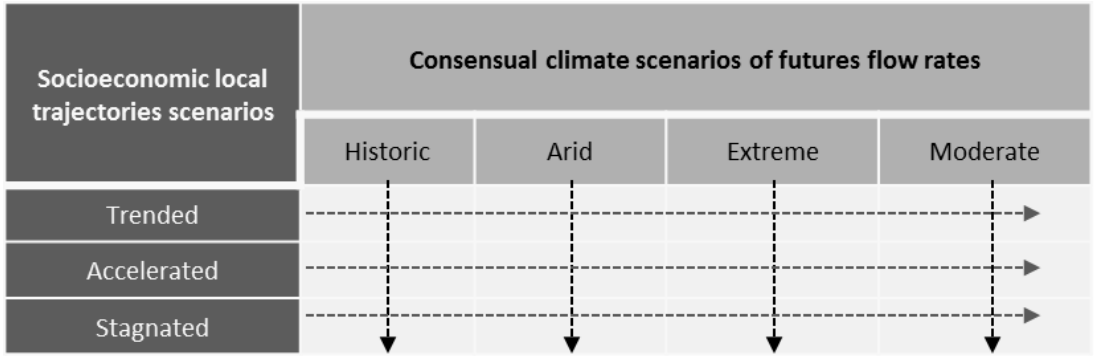
- Bring together climate science and economic perspective to **support decision-makers**

- **Dealing with uncertainty in a proactive manner**:

not trying to predict the future but be better prepare for whatever it might happen

- Continuous modeling from 2016 to 2065

- Bottom-up approach

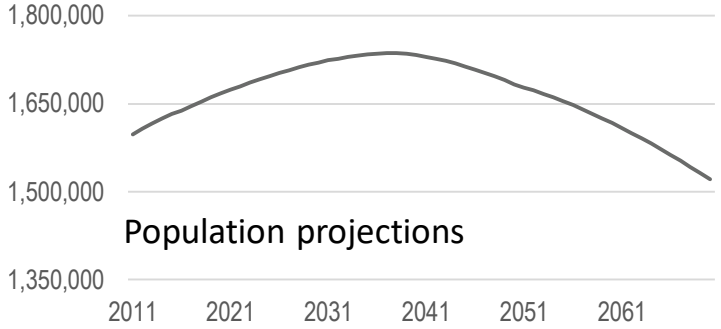


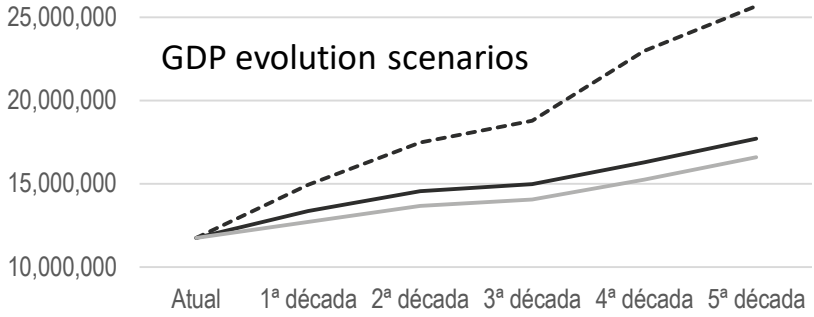
A. Current water demands

Type of user	Total water demand (m^3/s)	Percentage of the total (consumptive uses)
Urban supply	2,89	12,5%
Rural Supply	0,46	2%
Water diversion	1,61	4,7%
Animal watering	0,61	2,6%
Irrigated agriculture	17,48	75,4%
Industrial supply	0,65	2,8%
Aquiculture	18,98	-

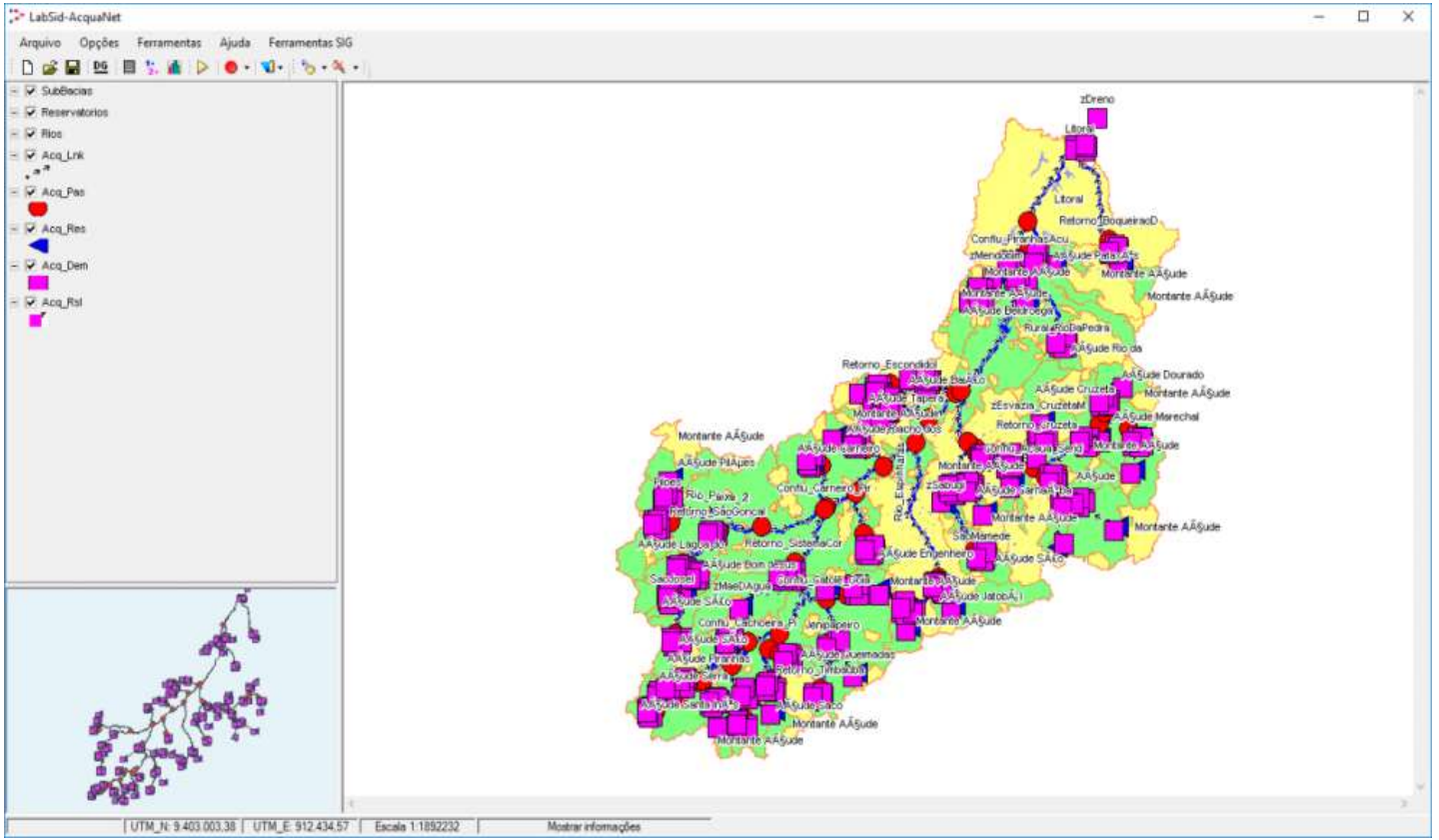
B. Socioeconomic dynamics and driving-parameters of future water demands

C. Projections of economic development and population growth





WATER ALLOCATION SOFTWARE AND THE CONDUCTED SIMULATIONS

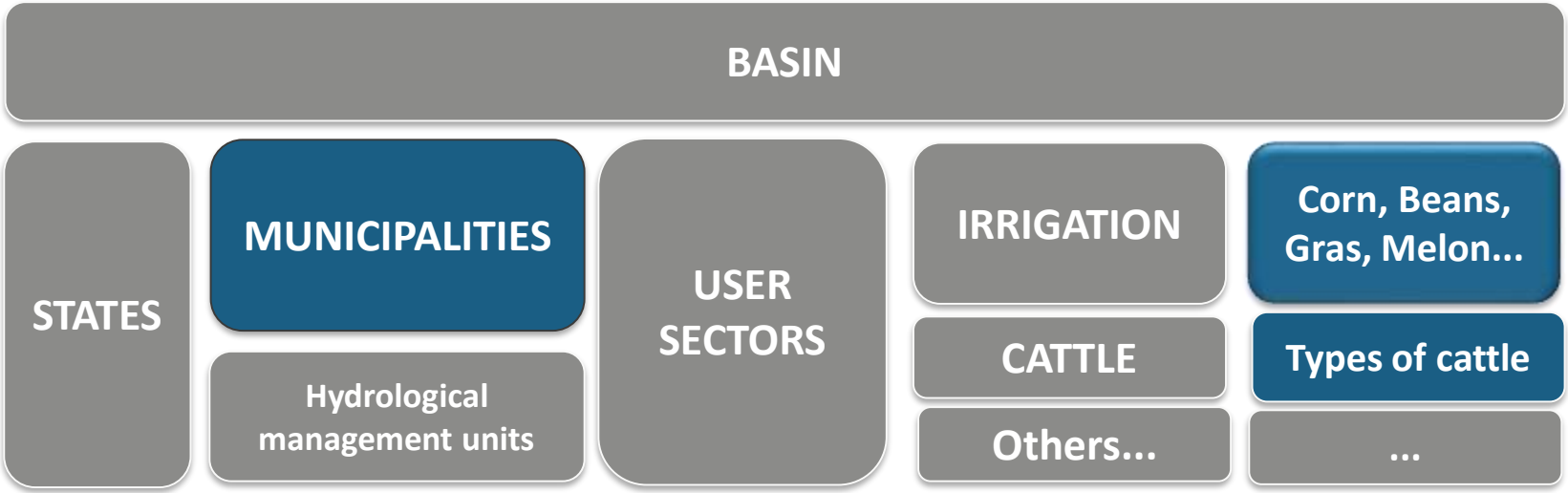


ESTIMATING ECONOMIC LOSSES FOR EACH WATER USER IN THE BASIN

Production function method

physical relation between the input production, in this case water, and the production activity in each water user sector

First order tangible losses

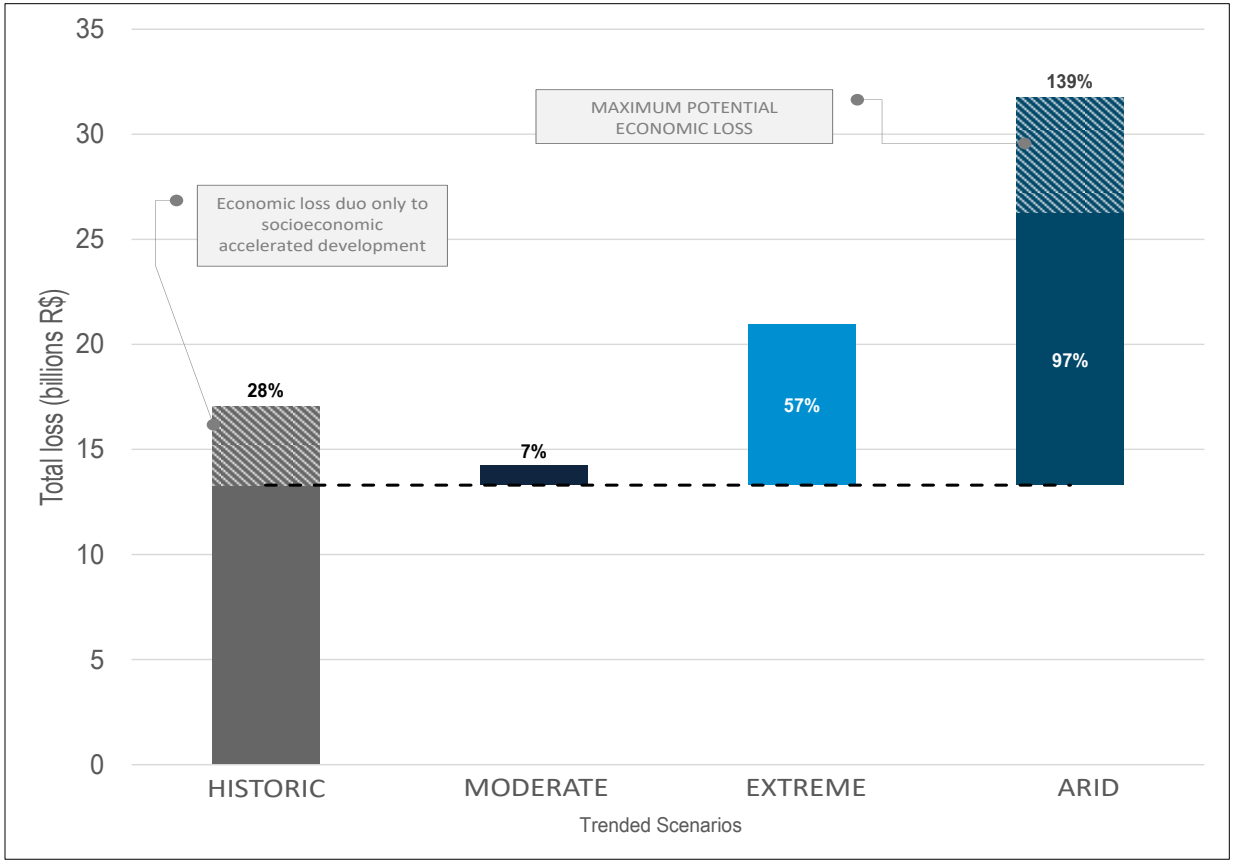


Example

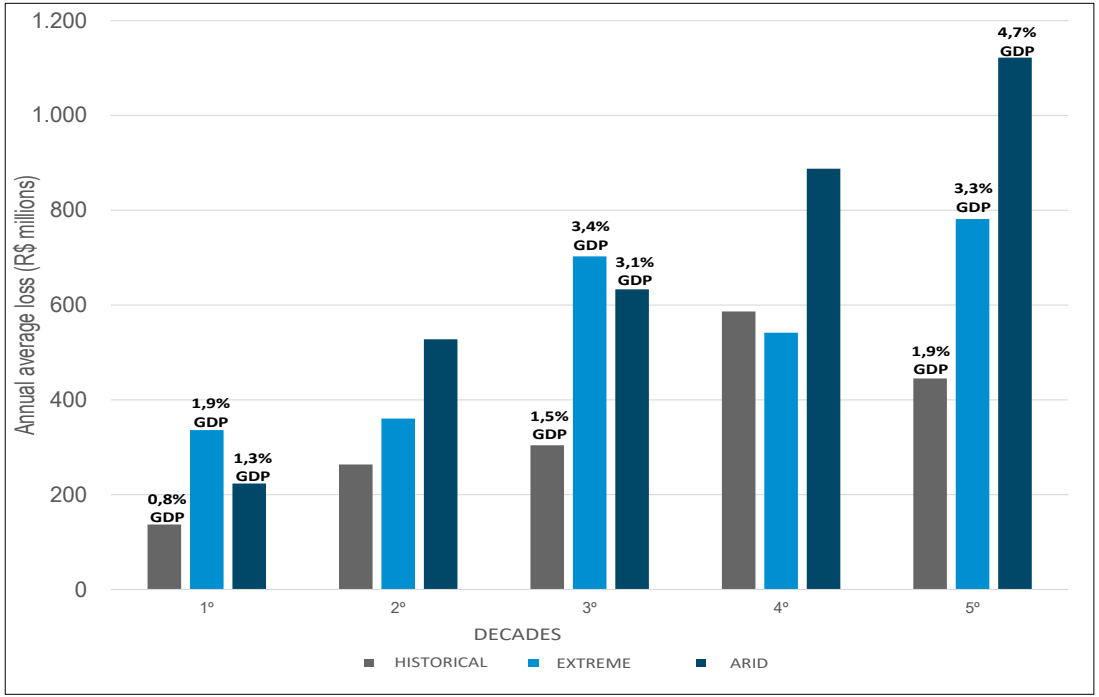
Most expressive types of agricultural crops in terms of water consumption, planted area, and size of production for banana; coconut; mango; corn; beans; rice; melon; and watermelon.

RESULTS AND DISCUSSIONS

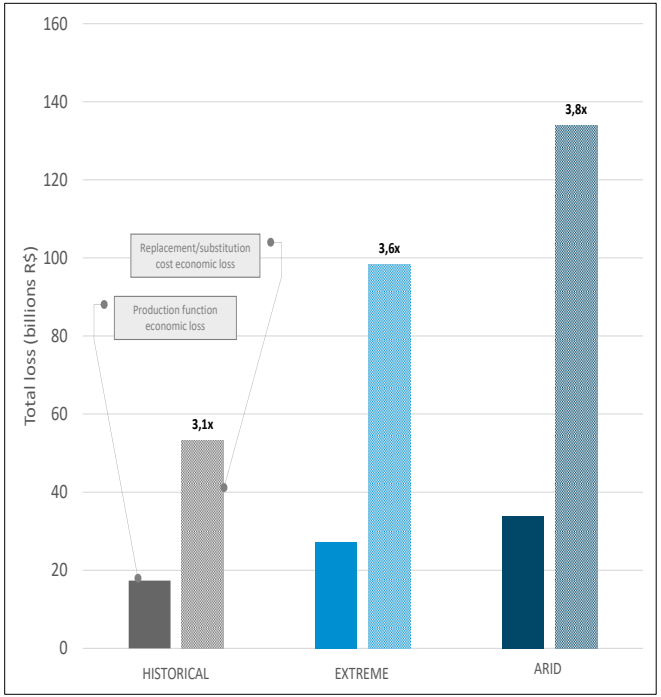
Total incremental economic loss per scenario in **50 years**



Evolution of annual average economic loss per decade and its relation with the basin GDP.



Comparison between the total loss calculated from two different economic methods



ACKNOWLEDGEMENTS

The cooperation with the National Water Agency (ANA) of Brazil was fundamental for developing this study.

THANK YOU!!

Layla Lambiasi
layla.lambiasi@fgv.br