Environmental Indicators to assist Sustainable Intensification practices in Espírito Santo, Brazil

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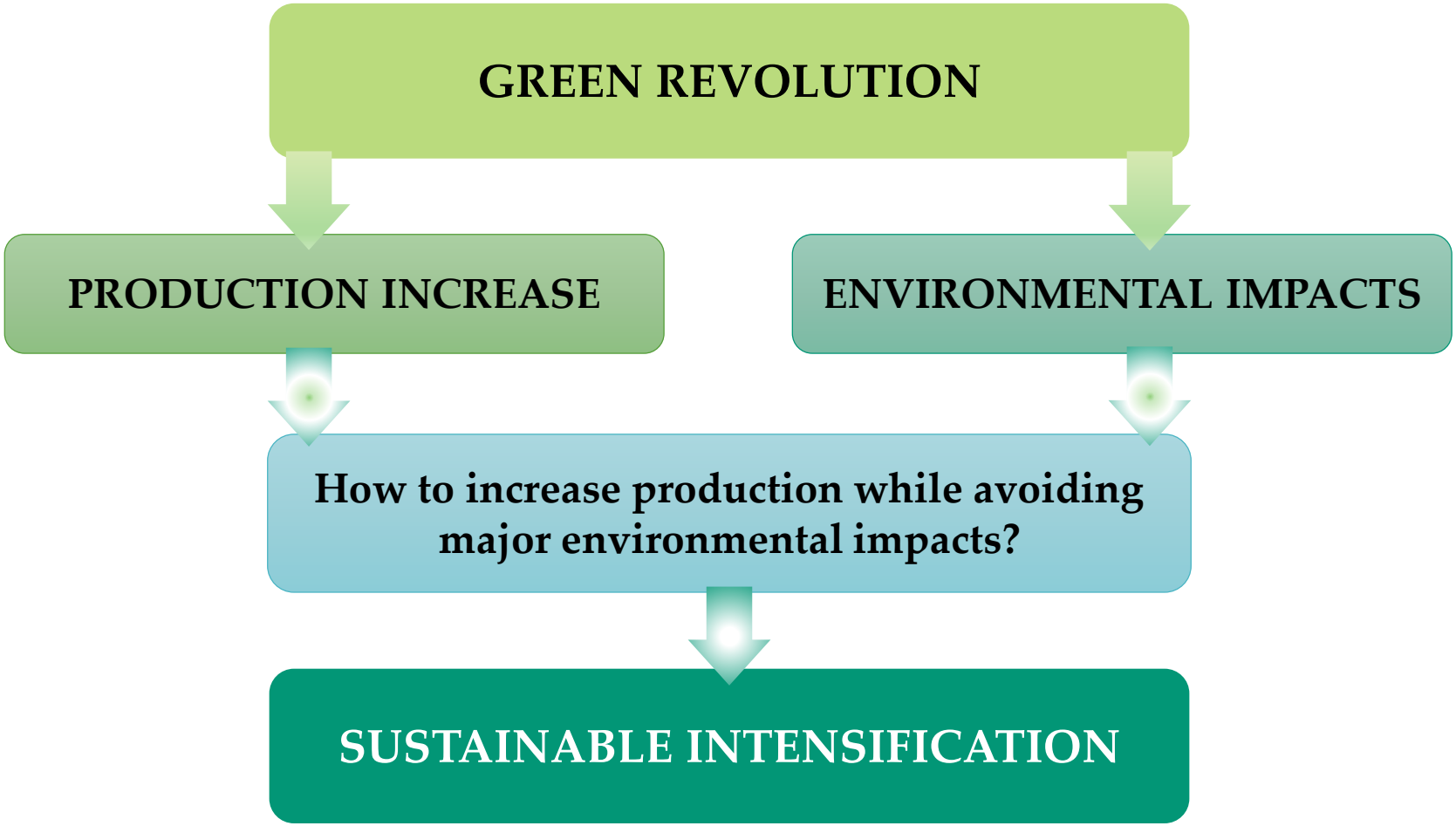
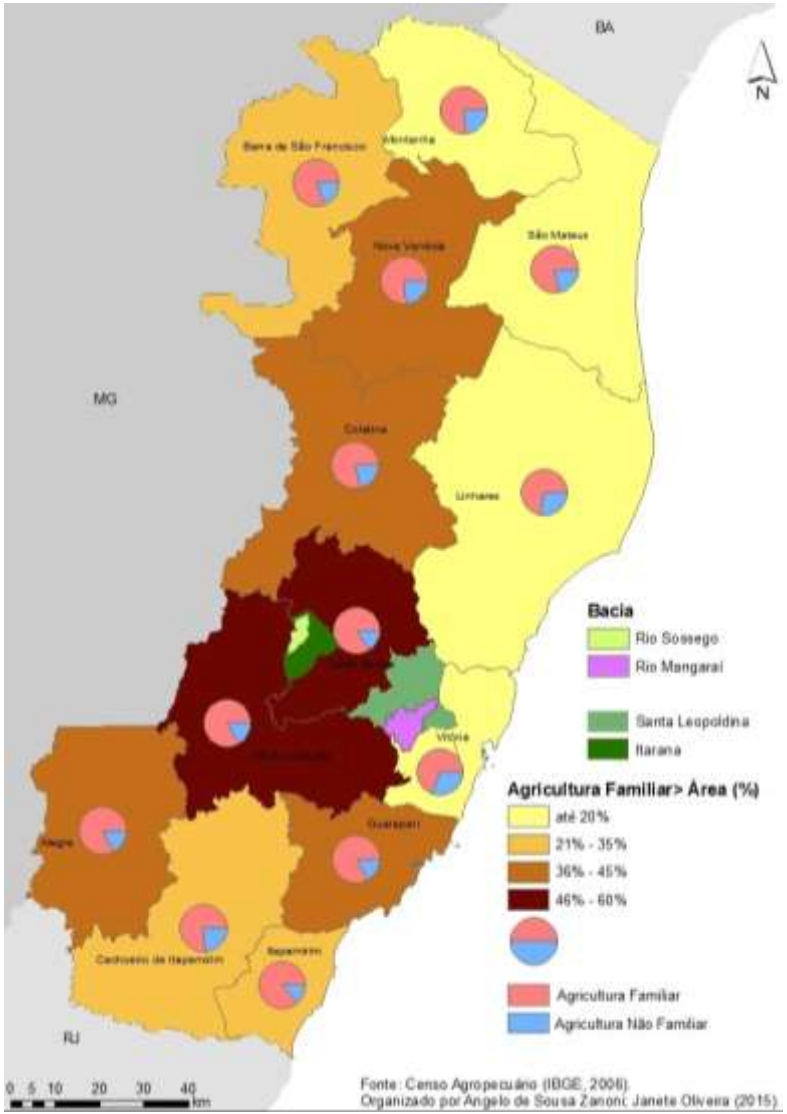
Introduction



Introduction

Family Agriculture in Espírito Santo



80% of rural commercial activities

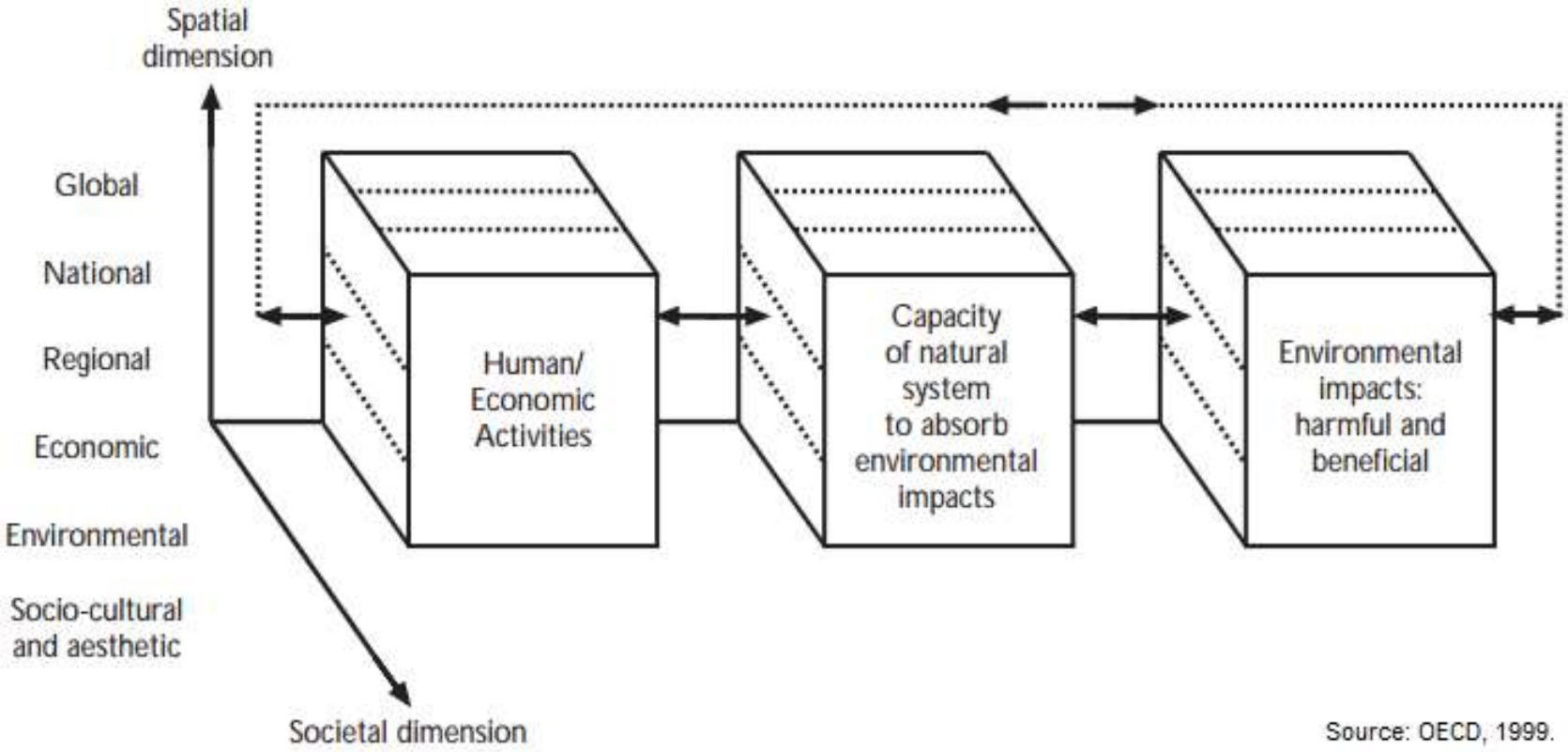
36% of cultivated lands

64% of rural workforce

44% of public revenue

13,2% of State GDP

Introduction



Source: OECD, 1999.

Introduction

Objective

- Identify, analyse and select environmental indicators to assist Sustainable Intensification practices in Espírito Santo, Brazil, focusing on family farming, with potential to be measured and assessed at catchment scale.

Methodology

Framework for agri-environmental indicators

Natural	Human	Social	Physical	Financial
Earth	Health	Institutional support	Access to infrastructure and energy	Family income
Soil	Education	Food security	Personal infrastructure	Market trends
Water		Family perceptions		
Atmosphere		Political representation		
Biodiversity				
Energy balance				

Source: Fernandes & Woodhouse, 2008.

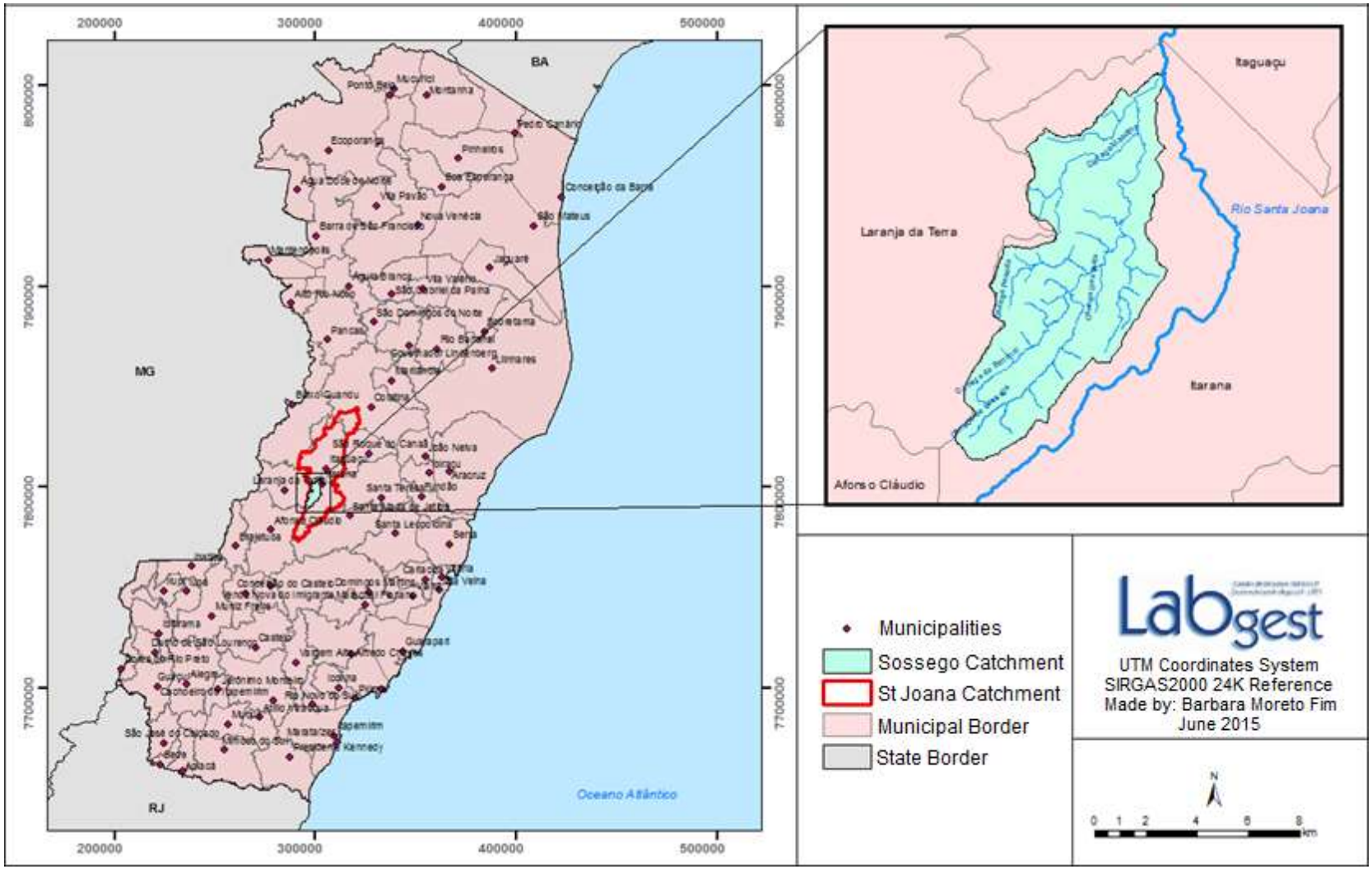
Methodology

- Meetings with research group on the project “Participative governance and collaborative integrated management at catchment scale for Sustainable Intensification of smallholder family farming.”

- Interviews with collaborators from INCAPER, the State’s agricultural research institution, and also family farmers of the municipalities of Itaguaçu and Itarana, which are part of the Sossego catchment.

Methodology

Location of Sossego Catchment



Results and Discussion

- There are maps and geographical interfaces with data on hydrography, terrain, geology, geomorphology, pedology, vegetation, land use and cover, rainfall, climatic zones, natural zones amongst others.

Results and Discussion

Indicators	Information	Timeframe
Soil's agricultural aptitude	Agricultural aptitude map for the Espírito Santo State.	Short term
Rainfall distribution	Historic average of rainfall on catchment/region.	Short term

Results and Discussion

Indicators	Information	Time frame
Susceptibility to extreme events	Measured by the Indicator of Suscptibility to Drought and the Atlas of Vulnerability to Floodings.	Short term

Results and Discussion

Indicators	Information	Timeframe
Level of forest cover	Percentage of the catchment covered by forest.	Short term
Level of Permanent Preservation Areas (APP) recovery	APP recovery in a given period of time.	Short term

Results and Discussion

Indicators	Information	Timeframe
Natural soil's vulnerability to erosion	Maps of geomorphology, pedology, rainfall intensity, slope and soil erodibility.	Short term
Energy usage by productivity	Ratio between the energy usage and the farm's productivity.	Short term

Results and Discussion

Indicators	Information	Timeframe
Water quality	Water quality in superficial water bodies.	Long term
Superficial water availability	Water bodies' flow rate.	Long term

Results and Discussion

Indicators	Information	Timeframe
Level of adoption of conservationist practices	Percentual of properties where conservationist practices are adopted.	Long term
Pesticides usage by productivity	Ratio between pesticides' usage and farm's productivity.	Long term
Water usage by productivity	Ratio between water usage and farm's productivity.	Long term

Final Considerations

- The indicators identified on this research were innovative to Sustainable Intensification, specially at a catchment scale, considering the approach on environmental and social issues.

- For better application of agri-environmental indicators on SI, it is more practical to explore extensively the data already available, instead of collecting more data for a too specific purpose.

Final Considerations

- Government institutions and farmers assess sustainability based on farmers self-sufficiency, while academia and NGOs main concern is usually ecology and natural resources.

- Ultimately, the process of elaborating and proposing indicators is not only a technical issue, it is also a political process, in which the conflicting priorities of embracing every opinion to achieve sustainable development must be weighted, assessed and discussed.

Universidade Federal do Espírito Santo

Labgest

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THANK YOU!

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