

# The effect of forest proximity on biological control of pasture in Northwest Mato Grosso, Brazil



## Keywords

Brazil, Northwest Mato Grosso, Amazon, REDES, WP3, cattle ranching, pasture pests, biodiversity and ecosystem impact, biological control valuation, land use policy.

## Main research question

Could biological control services provided by forest proximity in pastures be a significant incentive for landowners to keep the forest standing?

## Research finding in brief

Economic losses associated with spittlebugs – the primary pest affecting grasses in Tropical America – threaten cattle ranching profitability in the Amazon. The planned maintenance of forest patches within pasture dominant landscapes could effectively control spittlebug populations and thereby enhance farm incomes.

## Policymix approach

This study provides information for landowners and policymakers, to motivate them to take into account the value of the forest in agroecosystem management in Northwest Mato Grosso. Pest control of pasture is analysed, as an important ecosystem service provided by the forest for cattle ranching in the municipality of Cotriguaçu where it is the principal economic activity. The value of biological control, and means to improve its benefits, were assessed by the correlation between forest proximity and spittlebug (Homoptera: Cercopidae) infestation level on pastures – studied by field sampling and statistical analysis – and its estimated economic loss – based on values obtained through interviews with ranchers. We derived scenarios at different scales (farm and municipality) regarding cost-effectiveness of biological control strategies within the productive landscape as an incentive for forest conservation by estimating the value of this service, compared with the opportunity cost of conserving the remaining forest. These benefits were considerably greater than the opportunity costs of converting the forest to additional pasture. We found that biological control was optimized within a matrix including a series of forest patches of different sizes, with good connectivity between them to allow the movement of spittlebug's natural enemies in the landscape. Moreover, connectivity with large patches of forest should be favored, as they are the main source of natural enemies. Broader land use management strategies and policy instruments for biodiversity conservation were found to be complementary to such a matrix.



Mosaics of pasture and forest bring greater profits to cattle by biological control. Cotriguaçu, Brazil.

## Reference:

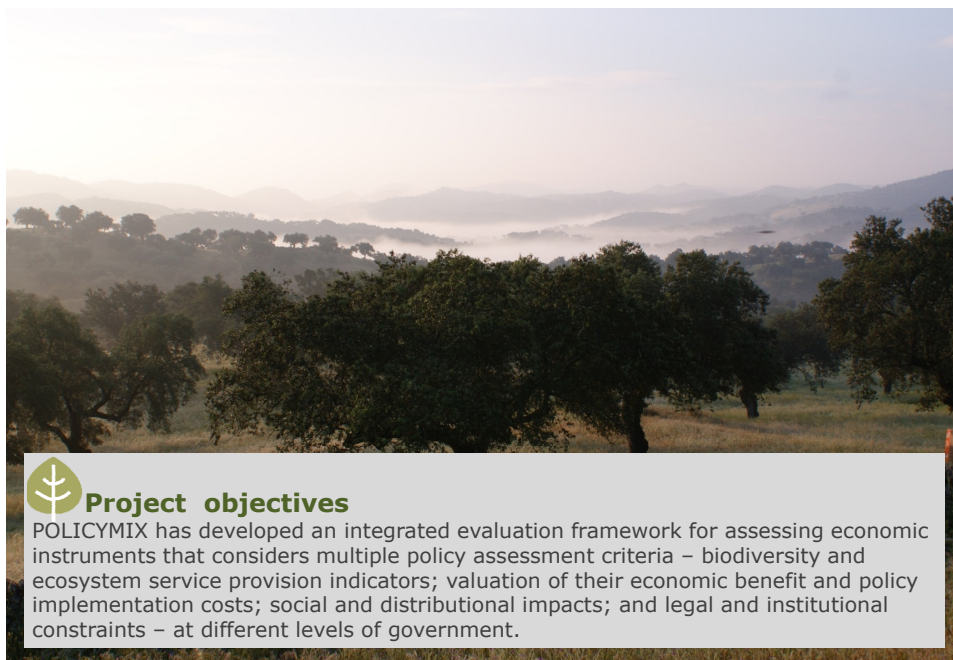
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## ASSESSING THE ROLE OF ECONOMIC INSTRUMENTS IN POLICYMIXES FOR BIODIVERSITY CONSERVATION AND ECOSYSTEM SERVICES PROVISION



### Project objectives

POLICYMIX has developed an integrated evaluation framework for assessing economic instruments that considers multiple policy assessment criteria – biodiversity and ecosystem service provision indicators; valuation of their economic benefit and policy implementation costs; social and distributional impacts; and legal and institutional constraints – at different levels of government.



### Methodology

POLICYMIX focuses on the role of economic instruments for biodiversity conservation and ecosystem services provided by forest ecosystems. The cost-effectiveness and benefits of a range of economic versus regulatory instruments are being evaluated in selected POLICYMIX case studies in Norway, Finland, Germany, Portugal, Brazil and Costa Rica. Comparative analysis evaluates the possibilities for transfer of policy success stories between Europe and Latin America, and promoting learning from policy failures.



### Training and dissemination

POLICYMIX actively used advisory boards including land users, local managers and national policy-makers, who collaborated with our researchers in the feasibility assessments of economic instruments. A web-based [POLICYMIX TOOL](#) encompassing policy impact assessment guidelines, case stories and demonstrations of policy assessment methods is aimed at supporting dissemination and learning.



### Results

POLICYMIX research discusses improvements in the design, targeting and implementation of economic instruments for biodiversity conservation through better understanding of (i) the linkages and complementarities between impact assessment tools, (ii) complementarities between different policy instruments in a policy mix, and (iii) trade-offs in design of a policy mix between economic, environmental and social impact criteria.

### EC Contribution:

3 458 312 €

### Duration:

2010-2014

### Consortium:

9 partners from 8 countries

### Project Coordinator:

Norwegian Institute for Nature Research (NINA) (Norway)

### Project Web Site:

<http://policymix.nina.no>

### Key Words:

Biodiversity, ecosystem services, policy mix, social ecological systems, economic instruments, payments for environmental services, ecological fiscal transfers

### Partners:

- Norwegian Institute for Nature Research (NINA), Norway
- Helmholtz Centre for Environmental Research (UFZ), Germany
- Foundation of the Faculty of Sciences and Technology, New University of Lisbon (FFCT-UNL CENSE), Portugal
- Institute for Environmental Studies, Vrije Universiteit Amsterdam (IVM), Netherlands
- International Institute for Environment and Development (IIED), UK
- Finnish Environment Institute (SYKE), Finland
- Rede de Desenvolvimento, Ensino e Sociedade (REDES), Brazil
- Fundação de Apoio a Pesquisa Agrícola (FUNDAG), Brazil
- Tropical Agricultural Research and Higher Education Center (CATIE), Costa Rica

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