

# Ecological Fiscal Transfers for Biodiversity Conservation Policy

## A Municipal-Level Analysis

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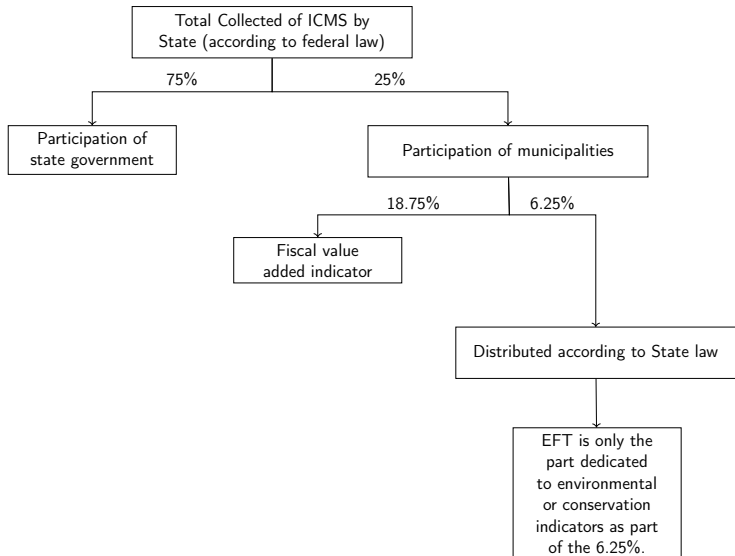
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Encontro Ciência 18

- 1 A TCP perspective for understanding a policy instrument for protected areas: a multi-level approach
  - The Design of the EFT Policy Instrument at State Level
  - Policy Formulation and Implementation of PA at Municipal Level
- 2 Levels of transaction costs for EFT at local level
- 3 Research design
- 4 Results
  - EFT in Minas Gerais for Biodiversity Conservation Policy
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# EFT in Brazil



# Policy Formulation and Implementation of PA at Municipal Level

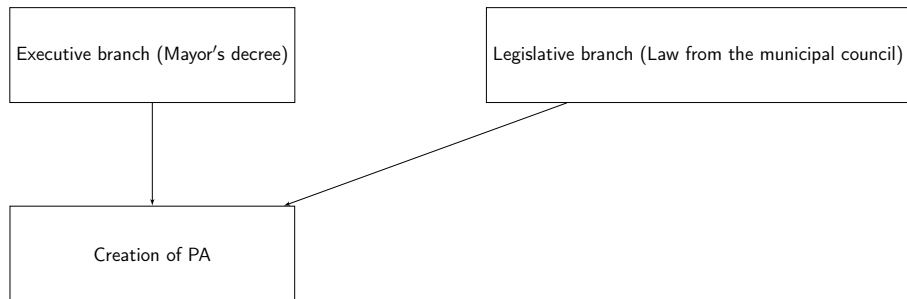


Figure: Policy process of creating a municipal PA after 2000

<b>Group</b>	<b>Management category</b>
Integral protection	Ecological station Biological reserve Natural monuments Wildlife refuge Municipal park
Sustainable use	Natural heritage private reserve Extractive reserve Sustainable development reserve Municipal forest Fauna reserve Area of relevant ecologic interest Environmental protection area

Table: Groups of PAs

# Levels of transaction costs for EFT at local level

Table: Levels of transaction costs to implement local PA

Stage of the Policy Process	Transaction cost	PA category
Policy Formulation ( <i>ex-ante</i> )	Expropriation costs	ESEC, REBIO, PM, RESEX, FLOMA, REFAU
	Rent-seeking costs	Mostly for integral protection use
	Sunk costs Collective costs	Mostly for integral protection use RESEX and REFAU face it more intensively
Policy Implementation ( <i>ex-post</i> )	Agency costs	For all categories

- **The first step is the study of the design of the policy instrument at the state level, detailing the evolution since its beginning until its actual version.**
- **The second step is an event history analysis (EHA) from 1966 to 2013.**
- Data source: data collected under the law on access to public information from Minas Gerais state

<i>Criteria</i>	1996	1997	1998
<i>Value fiscal added</i>	13.04702	8.4575	4.48608
<i>Geographic area</i>	0.333	0.666	1
<i>Population</i>	0.666	2.0420	2.71
<i>Munic. (largest population)</i>	0.666	1.3320	2
<i>Education</i>	0.666	1.332	2
<i>Food production</i>	0.333	0.666	1
<i>Cultural heritage</i>	0.333	0.666	1
<i>Environment</i>	0.333	0.666	1
<i>Health</i>	0.666	1.332	2
<i>Municipality tax revenue</i>	0.666	1.332	2
<i>Minimum quota</i>	5.5	5.5	5.5
<i>Mining town</i>	1.5	0.75	0.11
<i>Water resources</i>	0	0	0
<i>Number of prisons</i>	0	0	0
<i>Sports</i>	0	0	0
<i>Tourism</i>	0	0	0
<i>ICMS Solidario</i>	0	0	0
<i>Minimum per capita</i>	0	0	0
<i>Mateus Leme</i>	0.20383	0.1807	0.13555
<i>Mesquita</i>	0.08755	0.0778	0.05837
<i>Total</i>	25	25	25

Table: ICMS Distribution in Minas Gerais State

Source: law 12040/1995, law 12428/1996 law 13803/2000, and law 18030/2009

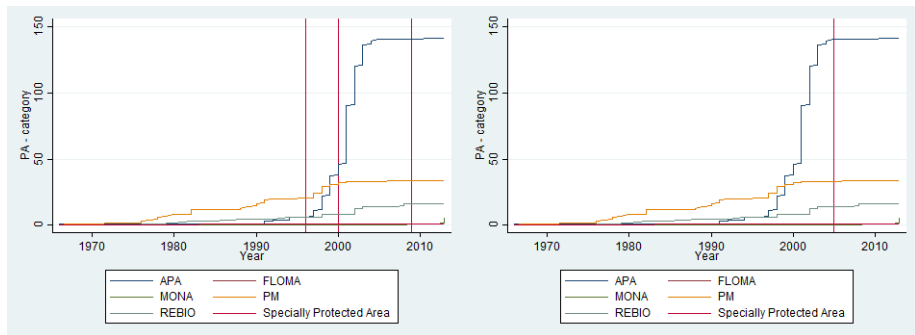


Group	Management category	FC 1995	FC 2000	FC 2009
Integral protection	Ecological station	1	1	1
	Biological reserve	1	1	1
	Natural monuments	1	1	1
	Wildlife refuge	1	1	1
	National park	0.9	0.9	1
Sustainable use	Natural heritage private reserve	0.9	0.9	1
	Extractive reserve	0.5	0.5	0.5
	Sustainable development reserve	0.7	0.7	0.5
	National forest	0.7	0.7	0.3
	Fauna reserve	0.3	0.3	0.3
	Area of relevant ecologic interest	0.3	0.3	0.3
	Environmental protection area (with env.-eco. zoning maps)	0.1 to 1	0.1 to 1	0.5 to 0.1
	Environmental protection area (without env.-eco. zoning maps)	0.025	0.025	0.025
	Eco. recovery private reserve	0	0.9	0.1
	Indigenous land	0.5	0.5	0.5
	Specially protected areas	0.1	0.1	0

Table: Conservation Index of the Protected Area

Source: law 12040/1995, law 13803/2000, law 18030/2009

# EFT in Minas Gerais



(a) PA Category

(b) PA Quality

Figure: PA analysis

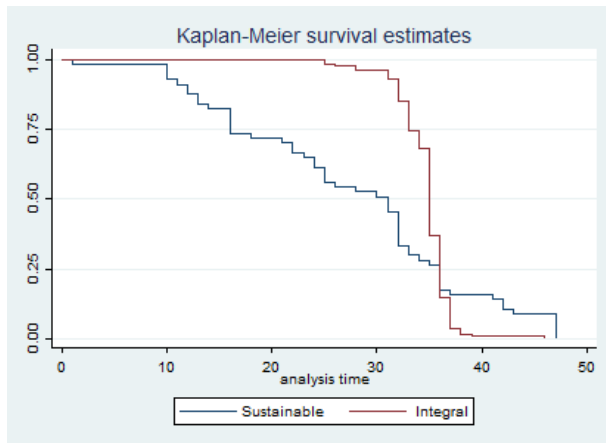


Figure: Groups

Table: Weibull regression

Conservation Factor x EFT	-3.306*** (-11.42)
Share of protected area	0.121 (0.61)
Quality index of protected area	2.019*** (3.94)
Environmental protection area (APA)	-4.338*** (-4.03)
Municipal park (PM)	-3.503** (-3.29)
Biological reserve (REBIO)	-3.370** (-3.11)
Natural monuments (MONA)	-3.884** (-3.11)
Municipal forest (FLOMA)	-5.034*** (-3.41)
National system of protected area (SNUC)	-2.480*** (-10.70)
Constant	-37.47*** (-14.07)
In_p Constant	2.507*** (39.15)
Observations	198

- Highlights:

- There is a higher degree of transaction costs in integral categories of municipal protected areas;
- The uncertainty of the ecological fiscal transfers revenue increases the commitment costs;
- The quality index of protected areas imposes additional costs to local governments (agency costs);
- The local governments choose the best institutional arrangement through the policy-making at local level, that is, they tend not to lose their discretion so much;

- THANK YOU  
comments are welcome  
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