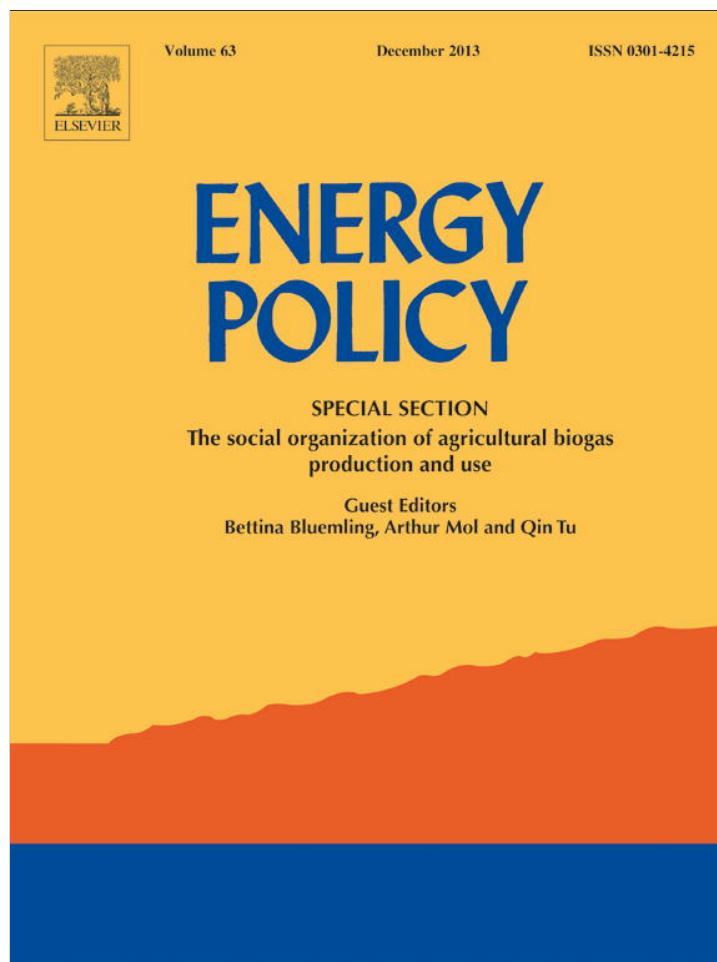


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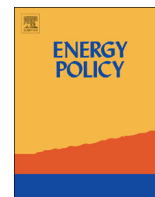
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Institutional analysis and the “resource curse” in developing countries



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HIGHLIGHTS

- The institutional strengthening is part of the solution for the resource curse.
- We observed a failure to adhere to Law 7.990/89 of the producer municipalities.
- The implementation of fundamental rights was not significant.
- The producer municipalities studied were not transparent.
- There are evidences of the resource curse in the producer municipalities studied.

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ABSTRACT

The present article examines the recent advances reported in the literature regarding the mechanisms underlying the “resource curse” in developing countries. By analyzing the Rule of Law Index, we investigated how the institutions responsible for allocating hydrocarbon royalties can help minimize the effects of the resource curse. We used a qualitative methodology based on case studies. The results show that evidence of legal violations on the part of these institutions and the lack of tools in resource-rich developing countries to uphold basic social and economic rights are associated with the resource curse. Our findings suggest that strengthening the institutions, closer monitoring of oil revenue allocations, and public participation can help to alleviate the resource curse.

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1. Introduction

Empirical analyses based on a survey of historical GDP data from countries that have been exporting fossil fuels since the 1970s, including oil and gas, have demonstrated that an abundance of natural resources and economic growth are not positively correlated, which has become known in the literature as the “resource curse” or the “paradox of plenty” (Mikesell, 1997; Auty and Gelb, 1986; Conway and Gelb, 1988; Gelb et al., 1988; Auty, 1988, 1991a, 1991b, 2003, 2005; Sachs and Warner, 1995, 1997, 1999, 2001; Sala-i-Martin, 1997; Doppelhofer et al., 2000).

However, other theorists criticize this perspective because it is solely based on economic growth. These theorists argue that studies based on these theories have not adequately distinguished between economic growth and economic development and that there is insufficient evidence to conclude that resource exporting activities detrimentally affect the development of resource-rich

countries (Davis, 1995, 2004; Davis and Tilton, 2005; Lederman and Maloney, 2007; Brunnschweiler, 2008).

Despite these objections, the views of the early theorists on the existence of the resource curse in countries rich in natural resources have prevailed, and several recent studies have indicated the role of strong institutions in helping these countries escape the resource curse (Sala-i-Martin and Subramanian, 2003; World Bank, 2007a, 2007b, 2008; Mehlum et al., 2006; Charlier and N'cho-Oguie (2009); Okeke, 2008).

Stevens and Dietsche (2008) argue that the current emphasis on institutions as potential solutions for the resource curse ignores the circumstances under which the institutions are formed as well as how they change. North (1990) discusses the institutional strengthening within the context of historical and structural changes.

The present study analyzes the institutional processes involved in allocating natural resource revenues and the measures that minimize the effects of the resource curse. Using more robust definitions of what constitutes the resource curse and its relationship with institutional changes, we introduce a methodology based on the Rule of Law Index, demonstrating its importance as a tool to reduce the risks and effects of the resource curse. The present article is divided into 4 sections. Section 2 briefly

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describes the theoretical framework used. Section 3 describes a case study involving an institutional analysis of the Brazilian oil industry. Section 4 details the results. Section 5 presents the conclusions..

2. The resource curse concept and its institutional dimensions

In the late 1980s, several studies on the impact of the natural resource sectors on mineral-exporting economies gathered evidence from the international community that demonstrated that little to no economic growth was achieved in these countries over an extended time span. In response to this evidence, researchers began to conduct empirical studies and analyses to identify the causes and characteristics of the resource curse (Sachs and Warner, 1995, 1999, 2001; Mikesell, 1997; Auty and Gelb, 1986; Conway and Gelb, 1988).

The first of these studies, written by Alan Gelb of the World Bank and published in 1988, was titled “Oil Windfalls: Blessing or Curse?” Gelb’s analysis demonstrated that despite oil price increases during the 1970s, the economic circumstances of oil-exporting countries worsened. Gelb concluded that the economic situation in these countries would be healthier if the oil prices had remained steady. According to Gelb, the boom initially experienced by these countries when oil prices rose, which led to the accumulation of capital, dissipated rapidly when prices fell in the 1980s.

In a series of articles and case studies, including his book “Sustaining Development in Mineral Economies: the resource curse thesis”, Auty (1988, 1991a, 1991b, 2003, 2005) showed that some exporting countries did not respond well to the commercial impacts of the oil price shocks in the 1970s. Despite an initial surge, industries based on mineral resources experienced disappointing economic growth and negative responses to structural changes in the mineral economy.

Neary and Van wijnenbergen (1986) discussed the macroeconomic effects of high oil price volatility on producing countries. Sachs and Warner (1997) reported evidence that manufacturing exports in countries with abundant resources tend to grow more slowly than in natural-resource-poor countries.

Corden and Neary (1982) and Sachs and Warner (1999) found evidence that countries with abundant natural resources tend to have well-developed service sectors and poorly developed manufacturing sectors compared to poor countries without natural resources.

Empirical analyses demonstrated that the existence and exploitation of mineral resources per se does not guarantee economic growth or decreased poverty rates in these countries. The wealth generated by mineral production has not contributed to strong economic performance in the producing countries. This phenomenon has become known as the “resource curse” or the “paradox of plenty” (Andrews, 2007).

Melby (2008), Bacon and Tordo (2006), and Stevens (2003) described the resource curse as a form of economic decline that can arise from the following conditions: (i) increased real exchange rates in response to income from natural resource exports, depressing other economic sectors (such as agriculture and industry) because of the new flow of resources (a process known as “Dutch Disease”); (ii) an increase in short-term inflation; (iii) reduced domestic consumption capacity resulting from increased commodity prices; (iv) weak controls on public expenditures; (v) increased corruption; and (vi) increased political and economic dependence on the income provided by the production and exporting of natural resources.

Some theorists have emphasized the evidence that institutional quality determines the presence or absence of the resource curse.

Thus, the combination of weak institutions with an abundance of natural resources can lead to the occurrence of this phenomenon (Mehlum et al., 2006). These authors proposed institutional analyses as a means to address the negative effects of natural resource exploration on producing countries (Stevens and Dietsche, 2008; Mehlum et al., 2006).

The present paper is also based on the premise that the resource curse is a phenomenon involving both economic consequences and institutional integrity. The resource curse can be described as the phenomenon by which oil-producing countries or localities do not receive the economic and social benefits expected from the wealth generated by the hydrocarbon industry either directly, through the stimulation of the local and national economy, or indirectly, through increased tax revenues as a result of government involvement. This latter factor is the subject of the present study.

In principle, one would expect that the wealth generated by the hydrocarbon industry would contribute to the development of localities that experience a boom in natural resources. However, this assumption does not always hold true, and careful decisions must be made to reverse the negative effects of the resource curse.

The resource curse is an institutional and economic phenomenon. Effective tools with which to identify the presence of the resource curse and the means to adequately manage and govern resource exploitation are essential to addressing this problem and preventing its occurrence in areas that experience natural resource booms.

Davis and Tilton (2005) and Vinod and Kaushik (2007) noted that experts on the topic have focused on adequate government and whether there is an assurance that the income generated by resource exports will be directed toward investments that promote development. On the topic of adequate government, these authors described solutions that require adequate incentives, including a clear definition of property rights; an internal political structure with rules to prevent corruption, waste, rent seeking, and other behaviors that are inappropriate in the public sector; and international pressure associated with the availability of loans from international financial organizations such as the International Monetary Fund (IMF).

Sala-I-Martin and Subramanian (2003) maintained that one of the strategies that companies could adopt would be to transparently make revenue payments by publishing them, thus causing governments that are not committed to wise spending to lose international assistance. These authors also proposed that more of the revenue be given directly to the citizens and less to the government and that mineral companies provide services for the locations impacted by their operations.

According to Stevens and Dietsche (2008), transparency concerning the dispersal of revenues is essential for monitoring, which also includes the creation of incentives and the means for popular participation in allocating and evaluating revenue expenditures. Thus, institutional performance evaluation constitutes a mechanism with which to determine how the government utilizes the revenue. Thus, institutional integrity becomes part of the solution for managing the risks of the resource curse.

Based on the principles of submission to the law, transparency, and the protection of human rights, the present paper analyzes the behavior of municipal executives with regard to the implementation of laws concerning recipients of the public distribution of hydrocarbon royalties. This study also assumes that the municipal executive knows and submits to the Brazilian hydrocarbon laws. In the present study, the rule of law implies that the municipal executive power directs the hydrocarbon revenues in its budgetary expenses in accordance with the law, transparently, and in a way that protects human rights, including social and economic rights.

This paper describes a qualitative comparative analysis using the public municipal budget and focusing on the average principle expenditures from 2000 to 2009 for 2 different groups of municipalities located in the State of Rio Grande do Norte (Brazil), designated as AG (Analysis Group) and CG (Control Group). The rule of law is an important qualitative indicator because the law might require allocations that are consistent with the development of a favored location.

However, in addition to legal compliance, it is essential to determine whether the law protects fundamental rights and whether the allocation process is transparent, thus allowing for the monitoring of the executive power. The present paper considers the protection of fundamental rights to be equivalent to the implementation of social and economic rights, such as education, health, and environmental conservation, through public policy. As a result, we studied socioeconomic data from these groups to measure the human development index results obtained from the studied localities and to determine their possible relationship with the institutional performance of the municipal executive power.

We propose criteria to evaluate the hydrocarbon industry that is able to qualitatively measure the tendency to develop a resource curse within the context of institutional conduct. Indications of the resource curse may be present when the institutions that allocate the revenues do not conform to the law, do not protect fundamental social and economic laws, or are not transparent about the revenue allocations.

3. Case study

According to North (1990), institutions are composed of the formal and informal rules (restrictions) created by humans to frame the structure of societal interactions. North believes that the role of institutions is to reduce the inherent uncertainties in human relations by creating stability through the application of a system of rules.

The Federal Constitution of 1988 is the highest standard in the Brazilian judicial system. This law states that the underground mineral resources, including oil and gas reserves, are the property of the Union and guarantees that the states, federal districts, and municipalities that participate in the exploration are appropriately compensated.

Law 7.990/1989 was passed to regulate this constitutional mandate, with specific provisions for the distribution of the oil and gas payments to these governmental entities. Later, Law 9.478/97 provided new rules for the distribution of oil and gas royalties (Costa et al., 2011).

The State of Rio de Janeiro is the largest producer of oil and natural gas, with approximately 11,707.25 million barrels of oil in proven reserves. Next is the State of Espírito Santo, with 1343 million barrels of oil in proven reserves. The third largest producer is Rio Grande do Norte, with 375.2 million barrels of oil in proven reserves. However, the State of Rio Grande do Norte is the largest producer in terms of onshore reserves, with 254.6 million barrels of oil in proven reserves (National Agency for Oil, Natural Gas and Biofuels (ANP) (2012)).

The present paper proposes a case study focused on Rio Grande do Norte because of this state's leading position of proven reserves and the decline of oil production in this state.

Rio Grande do Norte covers an area of 52,810,699 km². There are 167 municipalities in this state, including its capital, Natal, with an estimated population of 3,168,027 inhabitants in 2010 according to the Brazilian Institute of Geography and Statistics (Brazilian Institute of Geography and Statistics (IBGE) (2010a, 2010b)).

The State of Rio Grande has historically had a mature oil and gas industry, resulting in almost 4 decades with exploration, production, and discovery companies present in the state to advance hydrocarbon extraction in the region. Significant discoveries include Campo de Ubarana in the maritime region of the Potiguar Basin in 1973; the confirmation of the Estreito-Guamaré trend between 1975 and 1984, which was advanced by the discovery of the first onshore oil deposits in the region in 1979; and the discoveries of the deposits in the Belém and Alto dos Rodrigues fields (Lucchesi, 1998).

In addition, Petrobrás began to obtain results from a 3D seismic survey of the Potiguar Basin during the period from 1985 to 1997. Among these results was the discovery of the Canto do Amaro field in the Potiguar Basin (Lucchesi, 1998). To demonstrate the maturity of this basin, Fig. 1 shows the annual production of oil and gas in the State of Rio Grande do Norte from 2000 to 2009, illustrating the production decreases that occurred during this period. This pattern was caused by the discovery of marginal fields in this region, especially those offered in the second round of bidding by the National Petroleum Agency (ANP), which specifically offered these types of fields in 2006 (Santos, 2009).

Because of this scenario, the State of Rio Grande do Norte may be the first area in the nation to be financially impacted by a decline in hydrocarbon production. After establishing that production levels are declining and that the increases in the reserve/production ratio are not being maintained, it is important to evaluate the utilization of hydrocarbon revenues in this region using the principle of submission to the law and focus on the beneficiary municipalities from an institutional perspective. An analysis of partial data on the revenue from the hydrocarbon royalties shows how significant these royalties are to the budgets of these locations (see Fig. 2).

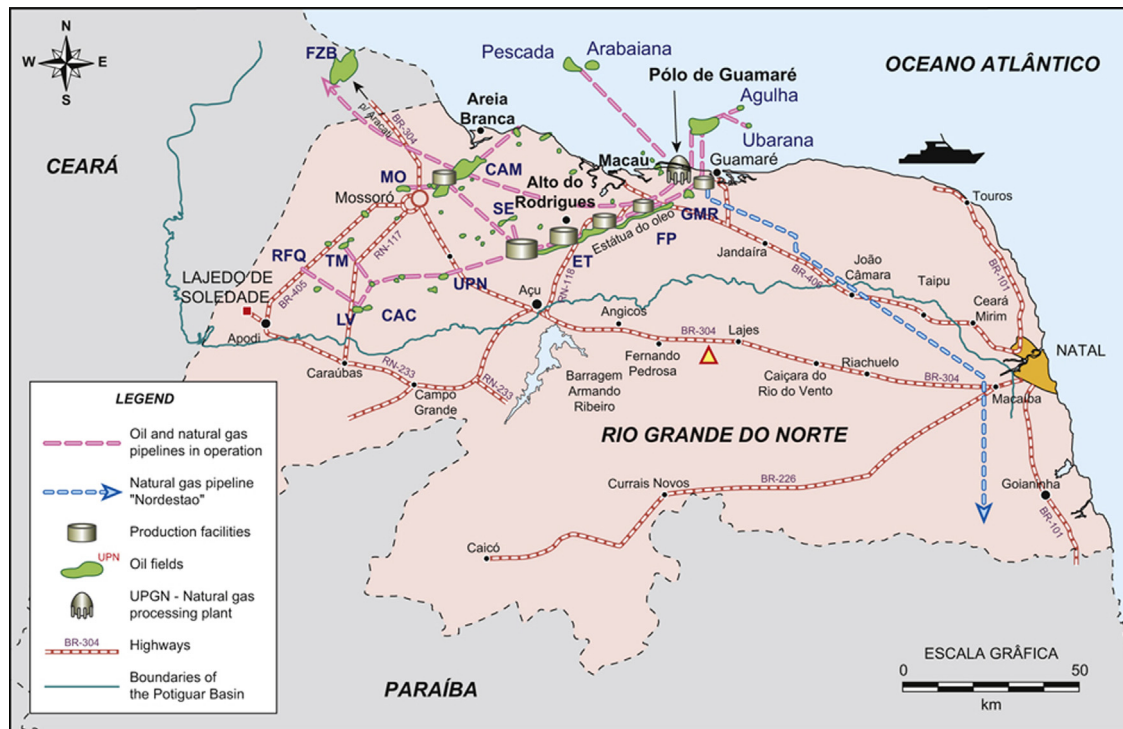
For example, the royalties from oil and gas exploration and production paid between January and July 2010 to Rio Grande do Norte amounted to US\$100 million. Of this total, US\$51.37 million was paid to the state government, and US\$49.6 million was distributed to 95 municipalities (Tribune of the North, 2010). The 95 beneficiary municipalities received approximately US\$76.25 million through November 2010. Table 1 shows the 6 municipalities that benefited the most from the revenues received in November 2010 (Nominuto.com, 2010).

Among the major municipalities, the present analysis will focus on Macau, Guamaré, Pendências, Areia Branca, and Apodi, which are designated as the Analysis Group (AG), because these are municipalities with a population similar to that of the Control Group (CG), unlike Mossoró, which is considered to be the hub of the region.

The following map shows the major projects developed in the upstream and midstream regions by the hydrocarbon industry in the State of Rio Grande do Norte, which are concentrated in northern and western Potiguar. The yellow line that runs from the northwest to the southwest of the state indicates the area considered by Petrobrás to comprise the Potiguar Basin.

Production fields near the respective municipal territories, as well as some producing municipalities such as Mossoró, Areia Branca, and Alto dos Rodrigues, and the gas and oil pipelines connecting the producing areas with both consumption and storage sites, are shown. The map also illustrates the maritime production fields of Pescada, Araibana, Ubarana, and Agulha (Map 1). The red line indicates the section of the "Nordestão" gas line that crosses the state and follows part of the northeastern coast (Brazilian Association of Channeled Gas Distributors (ABEGAS), (2010)).

The majority of the CG consists of affected municipalities, defined as those bordering the maritime production zone. In accordance with Law 7.990/89 and Decree 01/91, these



Map 1. The State of Rio Grande do Norte and the hydrocarbon industry projects. .

Source: Petrobras UN-RN/CE, 2001 in Alexandre, 2003 (PETROBRAS. Petrobras Notebooks: a history of a conquest—25 years of the UN-RNCE, volume 1. Rio de Janeiro: 2001.)

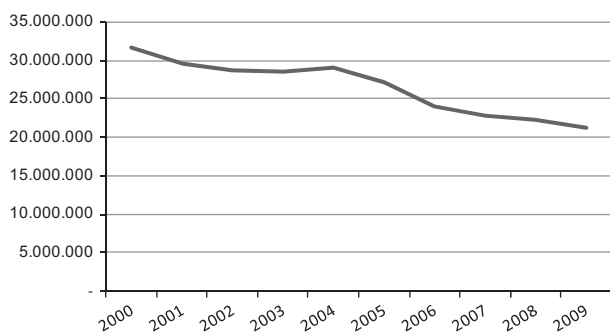


Fig. 1. The decline of production in the State of Rio Grande do Norte (in barrels of oil equivalent). .

Source: National Agency for Oil, Natural Gas and Biofuels (ANP) (2010)

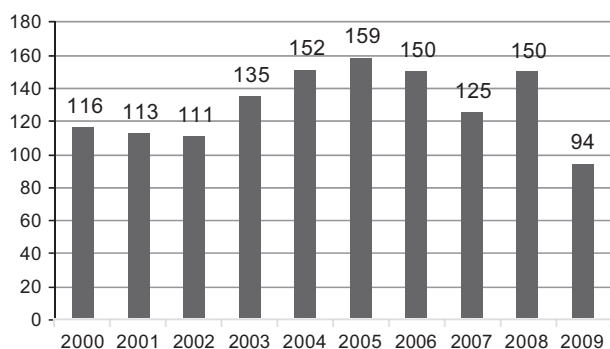


Fig. 2. The money received from 2000 to 2009 in millions of dollars (exchange rate: US 1 = R\$1.80 on January 13, 2012).

Source: Info Royalties, from ANP and the Getúlio Vargas Foundation (GVF); values were corrected by the GPI-DA, July 2011.

Table 1

Major beneficiary municipalities in the State of Rio Grande do Norte in November 2010. (US\$ 1 = R\$ 1.80 on January 13, 2012).

Source: Prepared by the authors using data from Nominuto.com (2010).

Producing municipality	Amount paid in November 2010
1. Macau	US\$ 1,020,340
2. Guararé	US\$ 967,061.10
3. Pendências	US\$ 796,813
4. Mossoró	US\$ 791,559.60
5. Areia Branca	US\$ 340,398.30
6. Apodi	US\$ 204,107.40

Table 2

Municipalities included in the Analysis Group (AG) and the Control Group (CG).

Source: Prepared by authors.

Group of municipalities	Selected municipalities
AG	Macau, Guararé, Pendências, Areia Branca, Apodi.
CG	Acari, Caicó, Carnaúba dos Dantas, Cruzeta, Currais Novos.

municipalities receive up to 5% of the royalties. They are all located in the Seridó Potiguar region and include Acari, Caicó, Carnaúba dos Dantas, Cruzeta, and Currais Novos. Table 2 summarizes the municipalities that comprise the AG and the CG.

The municipalities of Guararé (AG) and Macau (AG) have the largest volume of perceived resources (see Fig. 3). The municipalities in the AG receive a larger portion of the revenues than the affected municipalities because they are oil producers with active

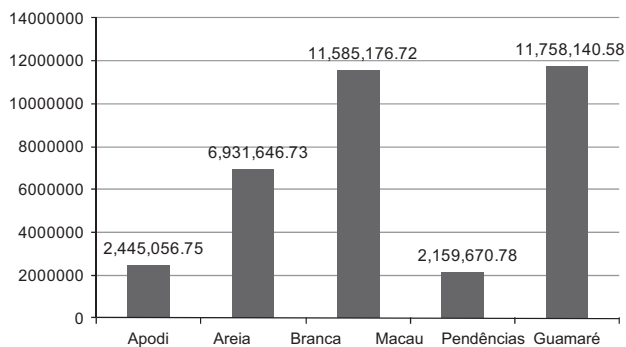


Fig. 3. The average revenues received by the AG municipalities (2000–2009) in millions of dollars (exchange rate: US\$ 1 = R\$1.80 on January 13, 2012). Source: *Info Royalties, 2010*, corrected using the GPI-DA, February 2010.

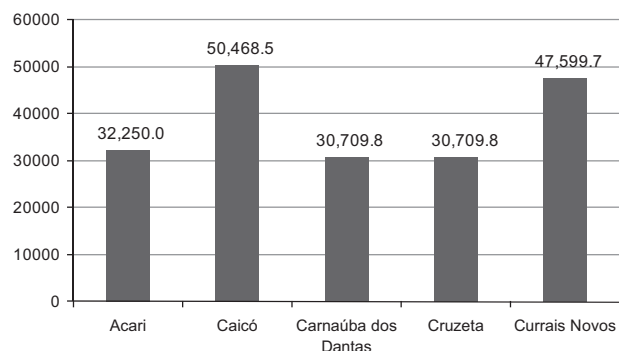


Fig. 4. The average revenues received by the CG municipalities (2000–2009) in thousands of dollars (exchange rate: US\$1 = R\$1.80 on January 13, 2012). Source: *Info Royalties, 2010*, corrected by the GPI-DA, February 2010.

exploration within their territorial limits.¹ The CG municipalities are affected because they border on the production zone. The amounts received by the CG are much lower than those received by the AG. Figs. 3 and 4 show the average amounts, in dollars, received between 2000 and 2009.

The amounts in Fig. 3 are shown in millions of dollars, and the amounts in Fig. 4 are in thousands of dollars. For example, Caicó, in the CG, received an average of approximately US\$50 thousand/year between 2000 and 2009. However, Guamaré, in the AG, received almost US\$11 million/year.

The current Brazilian Constitution (1988) gives the municipalities jurisdiction over several issues. Among these is the ability to legislate on points of local interest, provided for in Article 30, paragraph I, outside of the common powers outlined in Article 23. Table 3 lists the issues over which the municipalities have jurisdiction as described in Article 30 of the Constitution.

As shown in Table 3, the municipalities are responsible for providing services in the areas of education, health, territorial and

environmental management, and social welfare. Hydrocarbon royalties can be utilized to provide these services to the local population and to promote human development.

Law 7.990/89 prohibits states and municipalities from allocating hydrocarbon royalties for paying personnel and debts with the exception of those contracted with the Union. Law 9.478/97 does not set allocation rules for states and municipalities, allowing a large amount of leeway for public administrations; see Table 4.

Table 4 shows that the Brazilian municipal executives are responsible for allocating the royalties for enacting public policies and should comply with the rules set forth in Laws 7.990/89 and 9.478/97. In addition, within the leeway allowed by the rules, to evaluate institutional quality, the protection of fundamental social and economic rights is considered to be an acceptable expenditure of hydrocarbon revenue.

Two steps were used to evaluate the level of compliance with the laws by the municipal executive. The first step addressed the allocation of royalties by the municipal executive by examining the income and expenditures of groups of beneficiary municipalities, all located in the State of Rio Grande do Norte. Data were collected from the database of the Department of National Treasury (STN) within the Brazilian Financial dataset (FINBRA), from the United Nations Development Program (UNDP), from the Brazilian Institute of Geography and Statistics (IBGE), and from Info royalties.

We examined the data for evidence that the selected municipalities allocated royalties for the payment of personnel or debts other than those contracted with the Union. If this evidence was found, we concluded that there was a propensity to break the law. We also examined the transparency reflected by the accessibility of this budgetary data.

The second step in the methodology was a comparative analysis between the two groups, the AG and the CG, to determine whether hydrocarbon royalties have a differential effect on the social, economic, and environmental data for the beneficiary municipalities and contributed to the protection of fundamental social and economic rights.

4. Results

Table 5 shows the amounts of hydrocarbon royalties *per capita* for the AG and CG municipalities. Guamaré (AG) had the highest average hydrocarbon royalties *per capita* between 2000 and 2009. Each citizen in this municipality, if the royalties were directly distributed, would receive US\$1096.83 annually. Macau and Areia Branca had *per capita* distributions of US\$406.36 and US\$281.01, respectively. Comparatively, the royalties *per capita* of the CG municipalities were negligible.

Tables 6 and 7 show the average results for the ratios of oil income, tax rates, budget, and expenditures on investments for the AG and CG municipalities.

Table 6 shows that the hydrocarbon revenue is substantial in comparison to the taxes collected by the municipalities in the AG. In Guamaré, for example, the average revenue generated from hydrocarbon royalties was 14.14 times the total amount collected from municipal taxes.

Table 6 also shows the average ratio of oil royalties to the budget of the producing municipalities in the AG. The income provided by the hydrocarbon royalties provides a significant proportion of the municipal budgets. Guamaré, Macau, and Areia Branca were the most dependent on this income during the analyzed time period. This finding alone provides evidence of a resource curse.

Although data for the Guamaré budget are not available in the FINBRA database after 2006, which demonstrates a lack of

¹ According to Law 7990/89, which regulates up to 5% of the total royalty rate (10% of production), the producing municipalities receive 30% of the revenues from offshore production and 20% of the revenues from onshore production. However, the affected municipalities receive 10% of the revenues from offshore production and 10% of the revenues from onshore production. According to Law 9.478/97, which regulates the portion greater than 5% of the total royalty rate (10% of production), the producing municipalities receive 22.5% of the revenues from offshore production and 15% of the revenues from onshore production, and the affected municipalities receive 7.5% of the revenues from offshore production and 7.5% of the revenues from onshore production. In addition to these rates, the producing municipalities receive 10% in special compensation when there is a large volume of production or a large profit. Special compensation has progressive rates calculated based on the net revenue from the quarterly production of each field, the location of the well, the number of years it has been in production, and the quarterly production volume minus royalties, investments in exploration, operational costs, depreciation, and the taxes required by the current legislation.

Table 3

List of issues over which the municipalities have jurisdiction.

Source: CF/88, 2010.

Municipal Jurisdiction—Article 30 of the Constitution

To legislate on points of local interest. To supplement federal and state legislation as appropriate. To institute and levy taxes within its power and to apply its revenues without failing to meet accounting obligations and publishing financial records within the period set by law. To create, organize, and dissolve districts under state law. To organize and provide, directly or through contract or license, necessary public services in the local interest, including public transportation. To maintain, with financial and technical assistance of the Union and the State, preschool and elementary education. To provide, with financial and technical assistance from the Union and the State, health care services for the population. To promote, as appropriate, adequate zoning ordinances, designating planning and usage limits, for the division and use of urban land. To promote the protection of the local historical and cultural heritage in accordance with the law and federal and state monitoring.

Table 4

Restrictions on the allocation of hydrocarbon royalties for the beneficiary states and municipalities.

Source: Law # 7.990/89 and Law # 9.478/97.

Law	Type of governmental participation	Restrictions	Allocations
Law # 7.990/89	Royalties	Payments for personnel and debts, except for those contracted with the Union	None
Law # 9478/97	Royalties and special participation	None	None

Table 5

Oil royalties *per capita* – AG and CG (average from 2000–2009) in dollars (exchange rate: US\$1 = R\$1.80 on January 13, 2012).

Source: [Info Royalties, 2010](#), corrected by the GPI-DA, February 2010, IBGE, 2009.

AG Municipality	Per capita royalties (US\$)	CG Municipality	Per capita royalties (US\$)
Apodi	69.05	Acari	2.90
Areia Branca	281.01	Caicó	0.84
Macau	406.36	Carnaúba dos Dantas	4.42
Pendências	166.83	Cruzeta	3.81
Guamaré	1096.84	Currais Novos	1.14

Table 7

The ratios of oil royalties to taxes, budget, and expenditures for investments – CG (average from 2000–2009).

Source: [Info Royalties, 2010](#), corrected using the GPI-DA, February 2010.

Municipality	Royalties/Taxes	Royalties/Budget	Royalties/Investment
Acari	0.232	0.0064	0.095
Caicó	0.027	0.0022	0.068
Carnaúba dos Dantas	0.862	0.0081	0.098
Cruzeta	0.367	0.0084	0.157
Currais Novos	0.056	0.0031	0.046

Table 6

The ratios of hydrocarbon royalties to taxes, budget, and investment expenditures – AG (average from 2000–2009).

Source: [Info Royalties, 2010](#), corrected by the GPI-DA, February 2010.

Municipality	Income/Taxes	Income/Budget	Income/Investment
Apodi	4.90	0.17	1.65
Areia Branca	6.14	0.33	3.57
Guamare	14.14	0.49	1.47
Macau	9.58	0.43	3.48
Pendencias	5.57	0.22	2.83

Table 8

Expenses for the AG (average from 2000–2009) in millions of dollars (Exchange rate: US\$1 = R\$1.80 on January 13, 2012).

Source: [Brazilian Finance \(FINBRA\) \(2010\)](#).

Expenditure/Municipality	Apodi	Areia Branca	Guamare	Macau	Pendencias
Environment	0	0.67	0.05	0.06	0.01
Education	3.33	3.35	2.65	3.49	2.34
Health	2.17	2.88	3.02	3.14	1.52
Welfare	0.69	2.60	2.84	2.84	0.36
Administration	2.06	3.06	7.56	7.56	1.19
Legislation	0.51	0.71	0.67	0.67	0.3

transparency, during the data collection period, the average percentage of royalties as a portion of budgeted income was 49%.

Investment levels are much lower than the hydrocarbon royalties received for the majority of municipalities in the AG. In Areia Branca, for example, the amount of royalties was more than 3.57 times the amount invested, on average, during this period. This finding may indicate that the royalties were spent on personnel, as prohibited by Law 7.990/89. There is evidence that the municipal executives in the AG are breaking the law.

In [Table 7](#), municipalities such as Caicó and Currais Novos had the lowest ratio of royalties to collected taxes during the analyzed period.

The municipalities in the CG all had hydrocarbon royalties to budgeted income ratios of less than 1% (see [Table 7](#)).

The results show that the producing municipalities in the AG receive much more royalty income than their investment load. However, in the CG, as seen in [Table 7](#), the expenditures on investments are greater than what they receive from royalties. Although the amount of hydrocarbon royalties is lower in the

municipalities that comprise the CG, Caicó and Currais Novos confirm the tendency for independence of investments and income derived from hydrocarbon extraction, investing much more than what they received during the analyzed period. The results from the second part of the methodology are shown in the following tables.

The municipalities of Macau, Areia Branca, and Apodi had the highest average expenditures on education and culture (see [Table 8](#)). Municipalities in the CG also showed averages similar to those in the AG (see [Table 9](#)). In the AG, Macau, Guamaré, and Areia Branca had the highest level of expenditures for health and sanitation with approximately US\$3 million per year each. In the CG, the municipality of Caicó had the highest amount of expenditures from 2000 to 2009. Currais Novos had the second highest amount of expenditures. Similar results for the two groups were also found for the areas of welfare and social security.

Table 9

Expenditures for the CG (average from 2000–2009) in millions of dollars (exchange rate: US\$1 = R\$1.80 on January 13, 2012).

Source: *Brazilian Finance (FINBRA) (2010)*.

Expenditures/ Municipality	Acari	Caicó	Carnaúba dos Dantas	Cruzeta	Currais Novos
Environment	0	0.06	0	0	0
Education	1.12	4.18	0.83	0.86	3.68
Health	0.96	5.96	0.73	0.76	2.22
Welfare	0.24	0.29	0.29	0.21	0.61
Administration	0.68	2.71	0.41	0.50	2.48
Legislation	0.17	0.80	0.15	0.12	0.57

Table 10

Socioeconomic indicators for the AG (exchange rate: US\$1 = R\$1.80 on January 13, 2012).

Sources: UNDP, 2000; *Brazilian Institute of Geography and Statistics (IBGE) (2010a, 2010b)*.

AG Municipality	HDI-M (2000)	GDP at current prices (in thousands of SUS) (2008)	GDP per capita at current prices (in SUS) (2008)	Population (2010)
Apodi	0.654	139,825.56	3922.39	34,763
Areia Branca	0.71	270,987.78	10,776.15	25,315
Macau	0.69	259,087.22	9269.34	28,954
Pendências	0.631	75,023.89	5818.96	13,432
Guamaré	0.646	711,094.44	58,492.58	12,404

Table 11

Socioeconomic indicators for the CG (exchange rate: US\$1 = R\$1.80 on January 13, 2012).

Sources: UNDP, 2000. *Brazilian Institute of Geography and Statistics (IBGE) (2010a, 2010b)*.

CG Municipality	HDI- M (2000)	GDP at current prices (in thousands of SUS) (2008)	GDP per capita at current prices (in SUS) (2008)	Population (2010)
Acari	0.698	29,667.78	2643.73	11,035
Caicó	0.756	220,651.67	3530.59	62,709
Carnaúba dos Dantas	0.742	16,411.67	2330.89	7,429
Cruzeta	0.713	23,568.33	2929.19	7,967
Currais Novos	0.724	135,127.78	3119.66	42,652

The petroleum producers (AG) could have invested significant amounts in environmental management, but the data show that they did not.

The municipalities in the AG spend much more on municipal legislation than those in the CG. The administration costs of the CG were much lower than those of the AG, which may indicate that funds were shifted from sectors linked to protecting fundamental social and economic rights, which promote the population's human development, to support the administrative bureaucracy, thus breaking Law 7.990/89.

Tables 8 and 9 show that the expenditures of the municipalities in both groups are similar, with a baseline of US\$2 million. There are few municipalities with higher expenses, as previously shown.

Data on education and culture show that expenditures may influence the results of the HDI-M (see Tables 10 and 11) for some of the municipalities in the AG and for all of the municipalities in the CG.

In addition, in light of the large contribution of hydrocarbon royalties to the budgets of the municipalities in the AG compared

to the municipalities in the CG, one would intuitively expect higher investments in programs targeted at children, adolescents, the elderly, and other sectors needing assistance in the beneficiary localities.

With two exceptions (Areia Branca and Macau), the municipalities in the AG committed resources in the areas of welfare and social security at similar levels to those in the CG, which may indicate that hydrocarbon royalties were not directed to these areas. This behavior may show a tendency toward not protecting fundamental social and economic rights.

Although the GDP (current value) and GDP per capita for the AG municipalities were much higher than those of the CG, the HDI-M was the opposite (see Tables 10 and 11). This may also indicate that the municipalities in the AG do not utilize oil royalties to protect fundamental social and economic rights.

The results demonstrate that there are signs of the effects of a resource curse in the municipalities that comprise the AG, showing that expenditures are used, first and foremost, for paying personnel, which is prohibited by Law 7.990/89. Furthermore, within the leeway allowed by Law 9.478/97, it is clear that the expenditures approved by the executive were not significantly allocated to protecting fundamental social and economic rights. We discovered that some municipalities in the AG (Guamaré and Macau) did not make their budgetary data available for a number of years, which did not occur in the municipalities that comprise the CG. The municipalities in the AG exhibited weak institutional integrity compared to the CG municipalities in the institutional analysis.

5. Conclusions

We found indications of a resource curse in the municipal executive data for the localities studied in the Analysis Group. Using the proposed methodology, we observed a failure to adhere to Law 7.990/89, with public expenses being directed toward paying personnel. We also found that the oil industry in the municipalities in the AG did not significantly influence the implementation of fundamental social and economic rights. The municipal executives in AG localities were not transparent, thus hindering the monitoring of and popular participation in the administrative process.

The local management of the public resources derived from hydrocarbon royalties should be reviewed in the municipalities of the AG, with the aim of reducing poverty and social inequality in these territories. The results demonstrating poor institutional performance in these localities should be carefully examined to reduce the effects of the resource curse.

We recommend that municipal institutions be strengthened through legislative oversight and inspection by auditors and by the population. In addition, we suggest that municipal executives should be punished for their nontransparent operations, such as not presenting annual expenditures, including the sectors to which hydrocarbon royalties were directed. Furthermore, we recommend the creation of ways for popular participation in decision making with regard to local needs and the upholding of fundamental rights.

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