

On the mechanics of the political resource curse: information and local elite behaviour in Mozambique

Alex Armand, University of Navarra and NCID

Ana Isabel Costa, NOVAFRICA

Alexander Coutts, Nova School of Business and Economics and NOVAFRICA

Pedro Vicente, Nova School of Business and Economics and NOVAFRICA

Ines Vilela, Nova School of Business and Economics and NOVAFRICA

Grantee Final Report

Accepted by 3ie: November 2018



Note to readers

This impact evaluation has been submitted in partial fulfilment of the requirements of grant TW8.1008 issued under Thematic Window 8, Transparency and Accountability in Natural Resources. This version is being published online as it was received. A copy-edited and formatted version will be available in the 3ie Impact Evaluation Report Series in the near future. All content is the sole responsibility of the authors and does not represent the opinions of 3ie, its donors or its board of commissioners. Any errors and omissions are the sole responsibility of the authors. All affiliations of the authors listed in the title page are those that were in effect at the time the report was accepted. Any comments or queries should be directed to the corresponding author, Alex Armand at aarmand@unav.es.

The 3ie technical quality assurance team comprises Francis Rathinam, Kanika Jha Kingra, an anonymous external impact evaluation design expert reviewer and an anonymous external sector expert reviewer, with overall technical supervision by Marie Gaarder.

Suggested citation: Armand, A, Costa, AI, Coutts, A, Vicente, P and Vilela, I, 2018, *On the mechanics of the political resource curse: information and local elite behaviour in Mozambique*, 3ie Grantee Final Report. New Delhi: International Initiative for Impact Evaluation (3ie).

Funding for this impact evaluation was provided by 3ie's donors, which include UK aid, the Bill & Melinda Gates Foundation and the Hewlett Foundation. A complete listing of all of 3ie's donors is available on the [3ie website](#).

Acknowledgements

Many have contributed to the success of this report. However, we would like to acknowledge in particular the inspiring leadership of Imamo Mussa throughout different stages of this stage of the project, as well as the overall support of the Ministry of Science and Education of Cabo Delgado, without which this report would not have been possible.

In addition, we are grateful for the support of:

- All enumerators and supervisors that have spent countless hours working in the field;
- All the administrators and local leaders of the areas we worked in, without whose permission the project would not have run so smoothly;
- Benedita Carvalho, Ana Costa, Henrique Pita Barros, Matteo Ruzzante, Alexander Wisse for their precious and highly-motivated assistance during the fieldwork;
- The Aga Khan Foundation for providing a logistical base from where the project was conducted;
- Lúrio University for their partnership and collaboration.

Without the contribution of all of the above the success of this report would not have been possible.

Summary

Mozambique discovered substantial natural resources in recent years, drawing a considerable amount of enthusiasm from international players. The US Energy Information Administration (EIA) names Mozambique as “one of the most promising countries in Africa in terms of natural gas and coal resources”. Yet being a recent democracy with relatively weak institutions and limited media independence, Mozambique faces a considerable risk of resource and revenue mismanagement in the future.

In this context, it is crucial to understand the roots of the natural resource curse: the frequently observed decrease in income following a resource boom. The resource curse is often linked to political economy mechanisms. Two prominent channels are (1) generalized movements towards rent-seeking (decentralized) and (2) the deterioration of public policies by corrupt politicians (centralized). In this report, we study the near-immediate/short-term impacts of a large-scale information campaign of a newly-discovered natural resource extraction site on the relative importance of these theories in explaining local communities’ behaviour. We focus on the case of Mozambique, where a substantial discovery of natural gas recently took place in the Rovuma Basin. The area is located off the northern coast of Mozambique, in the Northern Province of Cabo Delgado. This province is characterized by a significant amount of natural resources and shares a number of demographic and political features, not only with the rest of Mozambique, but additionally with other countries that remain primarily rural, and that stand to change dramatically with newly exploited natural resources. In this sense, research in this context is extremely valuable in providing critical policy lessons that can be applied to many other countries.

We employ a large-scale randomized field experiment conducted in Northern Mozambique in 206 communities, after the natural gas discovery in the Rovuma basin, Cabo Delgado province. This discovery was labelled as the largest worldwide in many years. We follow the dissemination of information about the management of natural resources at the community level. We designed three specific interventions at the community level in this context: in the first, the information module was only delivered to local leaders; in the second, it was delivered to both local leaders and citizens; and in the third, the information module targeting both leaders and citizens was accompanied by the organization of deliberation meetings by citizens where public policy priorities for the community were discussed (in relation to the future windfall from natural gas). Communities were randomly chosen to receive one of these interventions or no intervention at all. The random allocation of communities to different groups guarantees that each group is statistically identical ex-ante. We performed extensive analysis to check that the randomization procedure achieves a good balance on a wide series of household and village characteristics.

Using a baseline survey collected in 2016, we observed that, despite the availability of different media for learning about the news of the province (namely radio, and family and friends), villagers in Cabo Delgado were characterized by a lack of information about natural resources and about the discovery of natural gas. Knowledge about the discovery was found to be closely related to demographic characteristics: women, younger individuals, less educated household heads, individuals living in smaller households, and lower income individuals had a lower probability of being aware of the discovery.

Following the baseline survey and for the purpose of establishing the impact of the different initiatives, the project introduced an innovative set of measurements of outcomes related to both villagers' and local elites' behaviour, by measuring a variety of outcomes through surveys, behavioural activities or structured community activities (SCAs), following Casey et al. (2012), and lab in the field experiments. Behaviour measurements are central outcomes in the study, since observed behaviour can provide fundamental improvements compared to stated preference-type results from survey data. We group our outcome measures in four sets: information/awareness outcomes on natural resources; elite capture (by local leaders); rent-seeking by leaders and citizens; mobilization, trust, and the demand for political accountability by citizens.

We find evidence that the community-targeted information campaign was effective in raising awareness and knowledge of citizens about the natural gas discovery. Citizens become optimistic regarding the future benefits of the discovery for their communities and households. Important, we identify impacts on increasing elite capture, when information is given to local leaders only. This appears in terms of leaders' attitudes in favour of corruption, misuse of funds for public purposes, and less meritocratic appointments of community members for public service. We also observe increases in rent-seeking activities by citizens when information is given to leaders only. This emerges for reported contacts with influential people, but also in the bidding for meetings with district administrators. These may denote movements by those close to leaders, consistently with the effects on elite capture. Finally, we report that community-level treatments increased citizen mobilization, trust at different levels, voice/accountability at different levels, and decreased the likelihood of violence. We conclude that our patterns of effects are more consistent with a curse mechanism centred on politician mis-behaviour, possibly countered by improvements in accountability, than one based on generalized movements towards rent-seeking.

These results are relevant for policy-makers dealing with the management of newly discovered natural resources for two main reasons. First, we show that a large-scale information campaign can be effective at raising levels of awareness in the population about a resource discovery and its related management debates. Second, we report clear effects on trust in government at different levels, as well as on decreasing violence. These findings are of crucial importance in face of the known association of the resource curse with localized conflict in resource-producing areas. The appropriate management of expectations of the local population and the implementation of inclusive deliberation processes as resource exploration unfolds may be key to escape the emergence of localized conflict. Information campaigns like the one we study in this study can be seen as a central piece of those efforts.

Contents

ACKNOWLEDGEMENTS.....	II
SUMMARY.....	III
CONTENTS	V
FIGURES.....	VI
TABLES.....	VI
ABBREVIATIONS AND ACRONYMS.....	VII
INTRODUCTION.....	VIII
1 INTERVENTION, THEORY OF CHANGE AND RESEARCH HYPOTHESES.....	1
1.1 THE INTERVENTION.....	1
1.2 THEORY OF CHANGE.....	2
1.3 HYPOTHESES.....	5
2 CONTEXT.....	6
3 EVALUATION: DESIGN, METHODS AND IMPLEMENTATION	7
3.1 SAMPLING AND RANDOMIZATION.....	7
3.2 MEASUREMENT	9
3.3 EMPIRICAL STRATEGY	14
4 PROGRAMME OR POLICY: DESIGN, METHODS AND IMPLEMENTATION.....	15
4.1 THE INFORMATION PACKAGE	15
4.2 COMMUNITY MEETINGS.....	18
4.3 DELIBERATION TREATMENT	18
5 TIMELINE.....	19
6 IMPACT ANALYSIS AND RESULTS OF THE KEY EVALUATION QUESTIONS	19
6.1 INFORMATION.....	19
6.2 ELITE CAPTURE	22
6.3 RENT-SEEKING.....	24
6.4 CITIZEN MOBILIZATION, TRUST, AND ACCOUNTABILITY.....	25
7 DISCUSSION.....	27
8 SPECIFIC FINDINGS FOR POLICY AND PRACTICE	27
APPENDIX. SAMPLE DESIGN	36
APPENDIX. SURVEY INSTRUMENTS.....	39
APPENDIX. PRE-ANALYSIS PLAN.....	41
APPENDIX. SAMPLE SIZE AND POWER CALCULATIONS.....	52
APPENDIX. DESCRIPTIVE STATISTICS.....	54
APPENDIX. INFORMATION PACKAGE	57
APPENDIX. PLAY SCRIPT FOR COMMUNITY THEATRE.....	74
REFERENCES.....	77

Figures

FIGURE 1 – THEORY OF CHANGE 3

FIGURE 2 – MAPPING OF OUTCOMES 5

FIGURE 3 – FLOWCHART FOR THE SAMPLING PROCEDURE 8

FIGURE 4 – CABO DELGADO PROVINCE 9

FIGURE 5 – THE INFORMATION FLYER 17

FIGURE 6 – TIMELINE OF ACTIVITIES..... 19

FIGURE 7 – AVERAGE TREATMENT EFFECT ON NATURAL GAS DISCOVERY AWARENESS 20

FIGURE 8 – HETEROGENEOUS EFFECTS OF THE INFORMATION TREATMENTS 21

FIGURE 9 – INFORMATION AND SPILLOVERS 22

FIGURE 10 – SELECTED DISTRICTS WITHIN MOZAMBIQUE AND WITHIN CABO DELGADO 36

FIGURE 11 – DISTRIBUTION OF VOTERS IN SAMPLED POLLING STATIONS AND ALL STATIONS 38

FIGURE 12 – GEOGRAPHIC DISTRIBUTION OF POLLING STATIONS..... 38

FIGURE 13 – POWER CALCULATIONS 52

Tables

TABLE 1 – A COMPARISON BETWEEN MOZAMBIQUE AND OTHER AFRICAN COUNTRIES 7

TABLE 2 – LEADERS’ AWARENESS AND KNOWLEDGE OF THE NATURAL GAS DISCOVERY 29

TABLE 3 – CITIZENS’ AWARENESS AND KNOWLEDGE OF THE NATURAL GAS DISCOVERY 30

TABLE 4 – ELITE CAPTURE 31

TABLE 5 – RENT-SEEKING AMONG LOCAL LEADERS 32

TABLE 6 – RENT-SEEKING AMONG CITIZENS 33

TABLE 7 – CITIZEN’S MOBILIZATION..... 34

TABLE 8 – TRUST AND ACCOUNTABILITY 35

TABLE 9 – DISTRIBUTION OF AVAILABLE AND SAMPLED POLLING STATIONS BY STRATA 37

TABLE 10 – OUTCOMES MEASURED USING SURVEY DATA 49

TABLE 11 – OUTCOMES MEASURED USING THE SCAS 50

TABLE 12 – OUTCOMES MEASURED USING BEHAVIOURAL GAMES 50

TABLE 13 – OUTCOMES MEASURED USING ELECTORAL DATA 51

TABLE 14 – OUTCOMES MEASURED USING QUALITATIVE DATA..... 51

TABLE 15 – MINIMUM DETECTABLE EFFECTS 53

TABLE 16 – DESCRIPTIVE STATISTICS 55

TABLE 17 – CORRELATES OF AWARENESS AND KNOWLEDGE AT BASELINE 56

Abbreviations and acronyms

ASPACADE	Provincial Association of Paralegals
BDM	Becker-DeGroot-Marschak
EIA	US Energy Information Administration
EITI	Extractive Industry Transparency Initiative (EITI)
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
INE	National Statistics office of Mozambique
MPCR	Marginal per-capita return
LNG	Liquefied Natural Gas
NR	Natural Resources
OLS	Ordinary Least Squares
PG	Public Good Game
RS	Rent-seeking Game
SCA	Structured Community Activity
UNDP	United Nations Development Programme
USD	United States Dollars
UPC	Provincial Farmer's Union
WTP	Willingness to pay

Introduction

Since Adam Smith's *Wealth of Nations*, which contains a number of unfavourable references to mining activities, economists have been wary of potential problems arising from the exploration of natural resources. Gelb (1988) and Auty (1993) were the first to propose the term resource curse: both looked at mineral windfalls and presented a series of case studies from a macroeconomic perspective, with a strong emphasis on the contraction of traded sectors, i.e., the Dutch Disease. Then, African countries such as Nigeria, Angola, and Sierra Leone, rich in oil and diamonds, became prominent cases in the 1990s. These cases contributed to the argument in the cross-country empirical literature that the resource curse was also related to political economy mechanisms involving widespread corruption (Treisman, 2000) and civil conflict (Collier and Hoeffler, 2004).

In this report, we focus on political economy mechanisms of the resource curse. We consider effects in face of news regarding the discovery of resources, i.e., the anticipation of a major resource windfall. We distinguish between two prominent mechanisms. One predicts that a generalized movement towards rent-seeking will emerge in the economy, at the expense of more productive activities (Tomell and Lane, 1999; Baland and Francois, 2000; Torvik, 2002). The other anticipates that, after news of the resource discovery, politicians will be more interested in securing political power, and as a consequence, will engage in corruption and inefficient policies such as clientelism (Robinson et al., 2006), with negative consequences for the economy. While the first mechanism does not explicitly mention politicians, the second puts them at the centre of action. We endeavour to distinguish between these political economy mechanisms of the resource curse by analysing reactions to a resource discovery at the local level. We are particularly interested in observing the behaviour of local politicians.

We employ a large-scale randomized field experiment conducted in Northern Mozambique in 206 communities, after a massive discovery of natural gas in the region (in the Rovuma basin, Cabo Delgado province). This discovery was labelled as the largest worldwide in many years. We follow the dissemination of information about the management of natural resources at the community level. These efforts were sponsored by a large coalition of governmental and non-governmental organizations, active in the international, national, and local arenas. We designed three specific interventions at the community level in this context: in the first, the information module was only delivered to local leaders; in the second, it was delivered to both local leaders and citizens; and in the third, the information module targeting both leaders and citizens was accompanied by the organization of deliberation meetings by citizens where public policy priorities for the community were discussed (in relation to the future windfall from natural gas). In the report, we focus on the near-immediate/short-term impacts of these interventions.

In our experiment, we designed a wide range of measurement instruments including surveys, behavioural activities or structured community activities (SCAs), following Casey et al. (2012), and lab in the field experiments. These are central outcomes in the study, since observed behaviour can provide fundamental improvements compared to stated preference-type results from survey data. We group our outcome measures in four sets. The first set is related to information/awareness outcomes on natural resources. These are based on surveys questions, administered to both local leaders and citizens, for which we typically

have both baseline and end line information. The second set concerns outcomes depicting elite capture (by local leaders). These are centred on behavioural measurements, including SCAs on the use of resources meant for the community (zinc sheets for roof construction, funds for meetings), the appointment of a community taskforce, and leader behaviour in a trust game. The third set connects to rent-seeking by leaders and citizens. This relies primarily on an SCA eliciting willingness to engage in rent-seeking, with a comparison term related to entrepreneurship, and a novel rent-seeking game. Finally, the fourth set links to mobilization, trust, and the demand for political accountability by citizens. The outcomes on mobilization are grounded on survey questions related to social capital, a matching grants SCA, behaviour related to community meetings, and a public goods game. The outcomes on trust and accountability are based on survey questions and citizen behaviour in the trust game.

We find clear positive effects of the community-level treatments on awareness and knowledge about the natural gas discovery. Citizens become optimistic regarding the future benefits of the discovery for their communities and households. Important, we identify impacts on increasing elite capture, when information is given to local leaders only. This appears in terms of leaders' attitudes in favour of corruption, misuse of funds for public purposes, and less meritocratic appointments of community members for public service. For instance, we find 29 percentage points leakage on leader funds for a community activity. We also observe increases in rent-seeking activities by citizens when information is given to leaders only. This emerges for reported contacts with influential people, but also in the bidding for meetings with district administrators. These may denote movements by those close to leaders, consistently with the effects on elite capture. Finally, we report that community-level treatments increased citizen mobilization, trust at different levels, voice/accountability at different levels, and decreased the likelihood of violence. We conclude that our patterns of effects are more consistent with a curse mechanism centred on politician mis-behaviour, possibly countered by improvements in accountability, than one based on generalized movements towards rent-seeking.

Our study relates to the vast literature on the natural resource curse, defined by Caselli and Cunningham (2009) as a decrease in income following a resource boom. The theory of the Dutch Disease was one of the first put forward to explain the resource curse. It proposed that resource booms shift inputs away from manufacturing (towards non-tradeable goods), and subsequently, to a curse through negative knowledge externalities in manufacturing. These ideas date back to at least Corden and Neary (1982). Our empirical knowledge of the resource curse is more recent. Sachs and Warner (1999) were the first to identify a negative relationship between GDP growth and exports of natural resources in cross-country data.

Several related models of the resource curse have been proposed which identify the resource curse with an increased propensity for rent-seeking. Tornell and Lane (1999) suggest that a windfall can increase interest group capture of fiscal redistribution; lower growth can follow through a move towards the (inefficient) informal sector. Baland and Francois (2000) propose a multiple equilibrium framework, in which a resource boom could lead to more rent-seeking (instead of entrepreneurship), depending on the initial equilibrium. Torvik (2002) introduces a simple model with rent-seeking and entrepreneurship and argues that, with a demand externality, a resource boom leads to lower welfare. This is generally the

case for this family of models, and for models of Dutch Disease: an externality needs to be assumed to explain the resource curse.

More recently, Mehlum et al. (2006) showed that the negative relationship encountered by Sachs and Warner only held for countries with low-quality institutions. Building on this finding, Robinson et al. (2006) proposed a new theory of the resource curse, based on a political mechanism: in face of a resource discovery, and when institutional quality is poor, namely in terms of political accountability, politicians are likely to enact inefficient policies that increase the likelihood that they remain in power (and benefit from resource rents). Vicente (2010) tests this assertion more specifically than Mehlum et al. by analysing patterns of change in perceived corruption after an oil discovery in the island-country of Sao Tome and Principe. He finds that vote-buying increased significantly after that discovery by using Cape Verde as a control group.

More recent empirical work has been devoted to the understanding of specific settings where natural resources are being explored. The case of oil in Brazil has inspired a number of contributions. Caselli and Michaels (2013) analyse impacts of oil on the structure of local income at the municipality level. They find no evidence of the resource curse. However, they find no significant changes in the quality of public good provision either, despite major increases in the revenues of local governments. Brollo et al. (2013) study the effect of these additional revenues on political corruption and on the quality of politicians. They show that larger transfers increase observed corruption and result in less educated mayoral candidates. In the context of Peru, Aragon and Rud (2013) examine the local impact of a large gold mine. They find evidence of a positive effect of the mining sector's demand for local inputs on real income.

Closely related to our experiment in Mozambique are three other contributions. First, our information and deliberation campaign is inspired by the model of Humphreys et al. (2006), who were the first to implement a large scale deliberative exercise related to the management of natural resources, with the Earth Institute at Columbia University, in the country of Sao Tome and Principe in 2004. Second, we are endowed with some knowledge about the impact of large-scale civic education campaigns in Mozambique, through the work of Aker et al. (2017) on political participation. Finally, recent work by Toews et al. (2016) shows positive impacts, namely in terms of job creation, of resource-induced FDI in Mozambique, while employing household and firm-level data.

1. Intervention, theory of change and research hypotheses

1.1 The Intervention

The intervention we are evaluating consists of a large information and deliberation campaign about the management of natural resources in the Province of Cabo Delgado, focusing on the recent natural gas discoveries. A large coalition of international, national, and local institutions, both governmental and non-governmental, sponsored the campaign. This group included the provincial government of Cabo Delgado, the Aga Khan Foundation, an international NGO with a strong presence in Cabo Delgado province, the Mozambican chapter of the Extractive Industry Transparency Initiative (EITI), two prominent national NGOs (the Christian Council and the Islamic Council of Mozambique), one university (the Catholic University of Mozambique), one newspaper (@Verdade), and two local NGOs (UPC, the provincial farmers' union, and ASPACADE, the provincial association of paralegals). In collaboration with our partners, the information and deliberation campaign was submitted at the community level. There were three types of campaigning.

The first group of communities (Treatment 1 - Information to Leaders) had the information module about natural resources and its management provided to the village leaders only. In Mozambique, these individuals are well-defined figures in each community. We targeted the higher-ranked representative of the Government within each community. In rural communities, these are known as village chiefs (*chefes de aldeia*), and in urban settlements as neighbourhood chiefs (*secretarios de bairro*). The community typically elects both types of leader, even though the ruling party can strongly influence such outcome. Their competences are mainly related to conflict resolution, land allocation, and formal ceremonies. They also influence the allocation of aid, employment and public programs, such as Government funding towards small entrepreneurs ('7 milhes' rural development program).

The other groups of communities were as follows. The second group of communities (Treatment 2 - Information to Leaders and Citizens) had the information about natural resources and its management provided to both the leaders and the citizens. Community meetings and door-to-door contact were implemented for this purpose in each community. The third group of communities (Treatment 3 - Information to the Leaders and the Citizens plus Deliberation) had the same intervention as communities in Treatment 2 plus a deliberation module. This module started with the formation of small citizen committees of around 10 people. Each group was then invited to meet and to deliberate on priorities for the local spending of natural resource revenues.

The information being distributed started by defining natural resources and the legal rights of the population in face of its exploration (various laws related to land, mines, forests, and fishing). This was a pre-condition for understanding, as the concept of natural resources was not present in many communities. The campaign then gave details about the discovery of natural gas in Cabo Delgado, including plans for exploration, and the implications for local communities. The final content of the information package was discussed and approved by all sponsoring organizations involved in the project, in order to guarantee widespread support and maintain neutrality.¹ Importantly, the information provided underlined the expected size of the

¹ The full information manual (in Portuguese) is presented in Appendix.

natural gas windfall, with significant positive implications for provincial government revenues and job creation.

Due to the low level of literacy in our context, treatments in this experiment focus on verbal communication methods to deliver information. They included:

- (i) Explanation in local language of the information content by trained facilitators. This was done either individually targeting leaders, or in the context of community meetings (for Treatments 2 and 3);
- (ii) (Live presentation of a community theatre, played by a team of three actors. The play represents a traditional family discussing the management of natural resources after hearing the news about the discovery of natural gas on the radio. The script was written by a local theatre company in collaboration with the research team, and was meant to communicate the contents of the information package in an informal manner²;
- (iii) Distribution of a three-fold pamphlet designed in collaboration with a local artist. The pamphlet is mostly visual and has the main takeaways of the information package. This leaflet was hand-delivered in each treatment community to the leader (for groups 1, 2 and 3) and to the community members (for groups 2 and 3).

1.2 Theory of Change

In this section, we discuss the theory of change behind the intervention that is subject of the study. The central assumption behind our theory of change is that if constituents were better informed about the inner workings of extractives governance, and they have ways to deliberate publicly, they would identify and communicate grievances, make claims on the relevant institutions, and demand better development and use of resources. Note that the ability to undertake public deliberation is likely to be a crucial element of the mechanism for change we plan to document in this study.

Our theory of change begins with the discovery of a large amount in a natural resource, with the potential of large revenues (see Figure 1). From this starting point, the proposed causal pathway begins with an intervention consisting of (1) distributing information in areas affected by resource extraction. Assuming that communities have heterogeneous and incomplete information about natural resource revenues is a reasonable assumption in a country like Mozambique, where corruption is high and the quality of governance of natural resources is low. Whether communities use benefits from natural resources properly and end up in a positive path, with investment of windfalls in activities that maximize social welfare, or in a vicious cycle, with rent-seeking activities and corruption, will depend to a great extent on the interaction between leaders and villagers within a given community.

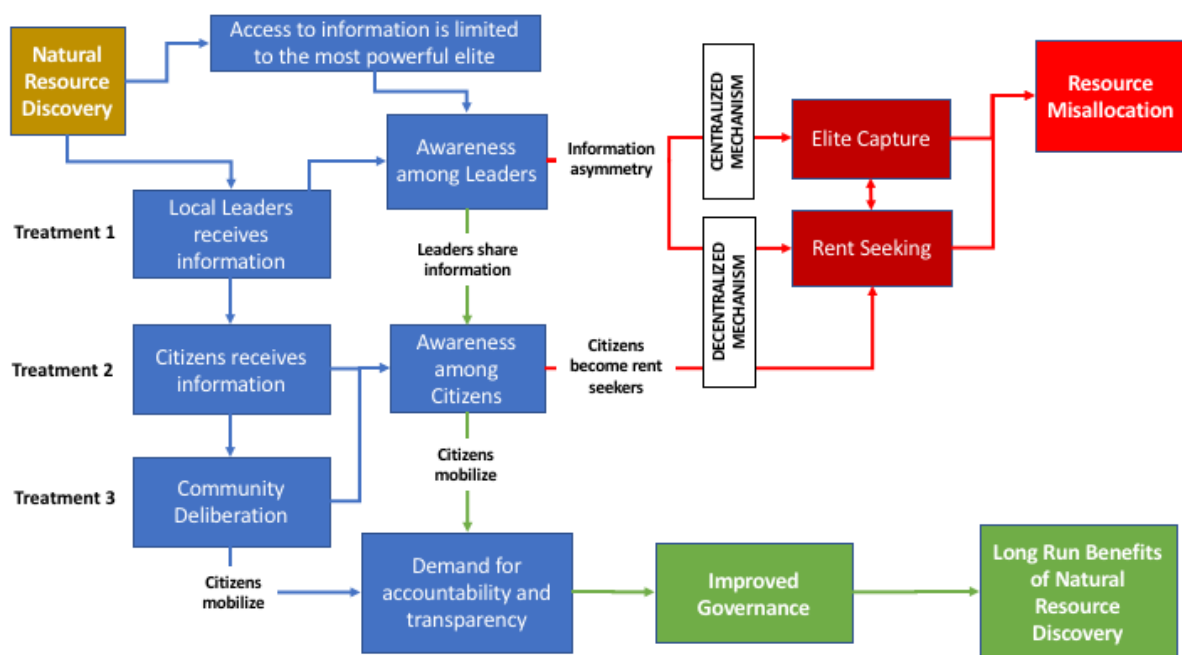
In the status quo, we assume that citizens are uninformed, and that information is available to the local elite that has higher access to information, that use it to capture rents. We study the effect of the provision of information about the discovery of the natural resource at different levels: firstly, information is provided to local leaders only; secondly, in addition to local leaders, information is provided to citizens; thirdly, in addition to the provision of information to leaders and citizens, a public deliberation is organized to discuss about the use of the future revenues derived from the exploitation of the natural resource.

² The script of the theater (in Portuguese) is presented in Appendix.

The hypothesized primary effect of this intervention is increased awareness and literacy in matters of natural resource development among the recipients of the information campaign.

If information is targeted at leaders only, their awareness about the discovery is going to increase, while if the campaign is also targeting citizens, the awareness is going to increase not only among leaders, but also among citizens. When information is limited to the leaders only, citizens can become aware of the discovery if the local elite decides to share the information with them, while they might remain unaware if the local elite decides to keep the information private. Our interest in information campaigns presupposes two factors needed to make it viable. The most central assertion is that individuals and households have an interest in understanding issues related to the management of natural resources. We also assume sufficient households and leaders are literate and able to process effectively the information they receive on this topic. We expect that information provided with deliberation mechanisms can increase the willingness of common citizens to contribute in public good provision, or to increase the sense of social cohesion of these communities. Just information is unlikely will lead to an improved sense of the common good. Still, we test both possibilities by running public good games as measurement instruments for the full sample in our study (see Section 3.2).

Figure 1 – Theory of Change



Note: we represent positive outcomes in green and negative outcomes in red.

Private information among the elite allows leaders to take advantage of information asymmetries, by increasing rent-seeking behaviour and elite capture. Instead, observing the current high level of opacity in the extractive sector in Mozambique, increased awareness among citizens can yield to an increased and sustained demand for accountability and transparency, such that these resources benefit communities.

This demand should ultimately translate to improved accountability and transparency, based on politicians' need to be re-elected or be reappointed. Lastly, transparency and accountability

will improve natural resource governance as elected and appointed leaders more consistently maximize the social utility of public resources.

In our theory of change the transformation of increased awareness and literacy on the issue into greater demand for transparency is founded on two hypotheses about political participation in Mozambique. The first and stronger hypothesis is that individuals receiving the treatment have established means of making claims on government institutions and officials (local leaders). The second and weaker hypothesis is that armed with the deliberation mechanism provided in one of the treatment arms, they would be able to make the claims on local leaders. The link between local communities' engagement (through information and deliberative meetings) to national policy is made through sustained bottom-up pressure of citizens and civil society groups, and through voting. Up to some extent, the national leaders and political representatives are ultimately vulnerable in face of a public engaged and interested in the issue. The information to be channelled to the population in our study have a strong local dimension: this information includes details of the timing and sequence of the extraction of natural gas in the Rovuma basin, the plans for building new infrastructures in the region by the government and by private stakeholders, the redistribution plan for public revenues at the local level, and intended corporate social responsibility initiatives by the natural gas multinationals in the region. Even though our experimental design is not suited to analyse the national impact of the interventions we study, we are able to assess at least qualitatively this impact.

Based on an increased demand for transparency from a more informed public, we expect that transparency and accountability increase. This result is founded on the inherent vulnerability of a politician or a bureaucrat in the face of an engaged public. An individual in such a position that wishes to maintain their office, reputation, or authority will respond, at least in part, to their constituents' demands for better resource management. This station in our theory of change may be problematic when considering some cases, as politicians in highly centralized, one-party, or autocratic governments may not derive authority from a public vote, and therefore bear little personal interest in what the public demands. In the case of Mozambique this is relevant although not critical; the multi-party voting system remains semi-democratic at worst, despite high levels of corruption.

To support our assumption, not the link between demand for transparency from a more informed public is supported by the fact that the demand of information about natural resource management in local communities is expected to be high. We do not have direct evidence on the receptivity of the local communities in Cabo Delgado to information on the extractive industry, as no specific survey is available. However, in the 2014 Gas Master Plan, the Government of Mozambique identifies the provision of information and the management of expectations within local communities as one of the pillars of the plan. The fact that the Government of Mozambique is underlying the importance of informed communities in a strategic document provides support for the potential and centrality of demand for information about revenue expenditures in affected communities, like Cabo Delgado. This demand is expected to become more salient along with the development of the sector, as socio-economic impacts are usually stronger near the area of exploitation (Aragon et al. 2015). In addition, another study in São Tomé and Príncipe provides support for the large potential of information demand following the discovery of a new natural resource exploitation possibility. Humphreys et al. (2006) report on a National Forum conducted in Sao Tome and Principe after an important oil discovery in that country. This National Forum consisted of community meetings

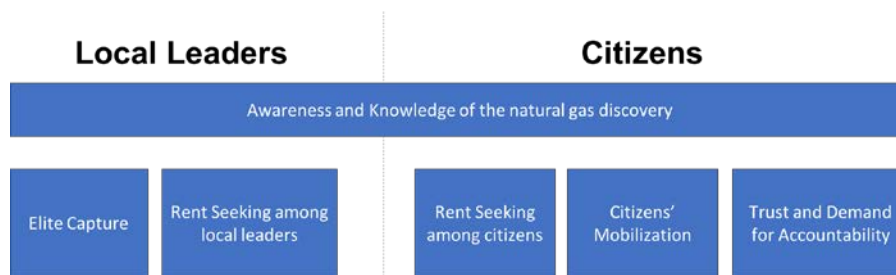
in the whole country on the management of natural resources in the country with a strong deliberation aspect. Approximately 3,500 citizens participated in these meetings, which correspond to 2.2% of the population of country. Personnel of The Earth Institute at Columbia University, with institutional support from the government, organized these meetings. We expect the same kind of adherence to the interventions we plan to follow.

Aware citizens can also produce an opposite effect. Expecting large returns from the discovery of the natural resource, citizens might deviate resources from productive activities and become rent seekers in order to obtain rents derived from the exploitation of the natural resource. This would lead to increase rent-seeking in the communities, and ultimately to resource misallocation.

In the scenario where on top of information villagers also have deliberation power, the leader would have limited ability to misallocate resources as citizens deliberate decisions. In this case, the disincentives to rent-seeking behaviour are expected to be higher than the incentive for a more transparent management, where everybody would benefit from. However, deliberation processes may still be subject to elite capture, as shown by Humphreys et al. (2006) in the context of the oil boom in Sao Tome and Principe.

Figure 2 presents a mapping of the outcomes covered in the study.

Figure 2 – Mapping of outcomes



Note: the figure presents the group of outcomes analysed in the report, distinguishing between leader's and citizen's outcomes.

1.3 Hypotheses

Given our theory of change, this study aims at understanding what are the causes leading from a natural resource discovery to the resource misallocation outcome. Following Caselli and Cunningham (2009), we distinguish between centralized and decentralized political economy theories of the natural resource curse. Centralized theories focus on the local elite as the centre of action: when faced with a permanent resource boom, under low institutional quality, they distort allocations to increase the probability of staying in power (Robinson et al., 2006). This is the case in which resource misallocation is led by local elite behaviour. Decentralized theories relate to generalized movements towards rent-seeking activities with negative consequences for entrepreneurship and the productive sector (Torvik, 2002). This is the case instead in which resource misallocation is led by citizens increasing their rent-seeking.

Our main hypotheses are as follows:

1. *Information on natural resources will affect elite's provision of public goods and investment in political connections.* Where Treatment 1 is implemented, i.e. where information about a future windfall reached leaders only, and eventually flows from these individuals, we expect elite capture and rent-seeking by leaders to increase, as a way to cement local power (Politicians distort allocations - centralized mechanism).
2. *Citizens' information on natural resources will affect the levels of social cohesion, trust, and political accountability in the community.* In a centralized mechanism, Treatments 2 and 3 are expected to induce higher levels of citizen mobilization. It is also expected that Treatment 3 leads to more citizen mobilization than Treatment 2 in face of the additional deliberation module.
3. *Citizens' information on natural resources will affect rent-seeking behaviour by citizens.* In a centralized mechanism, Treatments 2 and 3 are not expected to increase elite capture or rent-seeking by leaders and citizens, provided higher levels of local accountability. In a decentralized mechanism, we would expect a generalized increase in rent-seeking. Since all treatments include information about a future windfall, all are expected to result in increased rent-seeking by leaders and citizens. Increases in elite capture could accompany this generalized increase in rent-seeking, since capture and rent-seeking by leaders overlap in most real examples.
4. *Citizens' information on natural resources will affect citizens' political participation.* In a centralized mechanism, Treatments 2 and 3 are expected to induce higher levels of citizen mobilization. In a decentralized mechanism, we do not expect clear effects on citizen mobilization, since politics are not explicitly important.
5. *Elite information on natural resources will affect citizens' behaviour in 3.-5.* In a centralized mechanism, rent-seeking activities by citizens could also increase as a consequence of Treatment 1, as leaders induce movements in linked individuals.
6. *Giving deliberation power to the citizens will affect elite's provision of public goods and investment in political connections, the levels of social cohesion, trust, and political accountability in the community, rent-seeking behaviour by citizens and citizens' political participation.* In a centralized mechanism, Treatments 2 and 3 are expected to induce higher levels of citizen mobilization, while Treatment 3 would lead to more citizen mobilization than Treatment 2 in face of the additional deliberation module.

2. Context

The northern province of Cabo Delgado, Mozambique, is characterized by significant reserves of natural resources, particularly the natural gas at the Rovuma Basin, which remains to be extracted. The majority of the country's labour force is engaged in agriculture activities, with 81 percent of its population reporting agriculture as its main occupation. Cabo Delgado province is in line with the national average for several demographic and socio-economic characteristics. It has on average 22.15 inhabitants per km² and a total of 1.8 million habitants (National Statistics office – INE, 2013). In terms of poverty, it experiences a poverty rate of 37.4%, and a child mortality of 180 per 1000 births, slightly higher than the national average (UNDP 2010 Report on the Millennium Development Goals).

Mozambique shares a number of similarities with several other countries in the African continent, in terms of characteristics of the economy, quality of institutions, and recent discovery of natural resources. While Mozambique has found some of the largest natural gas deposits, Tanzania, Uganda, and Kenya have also recently discovered gas and oil reserves. Similar to Mozambique, these countries share relatively weak institutions and low political accountability. Table 1 presents a comparison with Kenya, Uganda and Tanzania on different indicators.

Table 1 – A comparison between Mozambique and other African countries

INDICATOR	Mozambique	Tanzania	Uganda	Kenya
Corruption index position 2015, Transparency International	119/175	119/175	142/175	145/175
GDP (PPP) per capita 2014, IMF	1174 USD	2667 USD	2023 USD	3084 USD
Population 2010, World Bank	23.4 Million	44.8 Million	33.4 Million	40.5 Million
GDP USD, 2010, World Bank	9.59 Billion	23.1 Billion	17.0 Billion	31.41 Billion
Infant Mortality rate (per 1000) 2010, World Bank	92.2	50.0	63.0	55.1
Life Expectancy 2009, World Bank	49.28 years	56.59 years	53.07 years	55.84 years
Literacy rate 2009, World Bank	55.1 %	72.9%	72.2%	87%
Total NR Rents as % of GDP World Bank, 2011	12.5%	9.6%	13.9%	3.4%

In terms of corruption, the Corruption index shows that these countries face similarly weak institutions. On average, Mozambique is poorer, has higher infant mortality, lower life expectancy, and a lower literacy rate. Importantly, these countries have in common a small contribution to GDP from extractives. However, they also share the expectation that this contribution will rise sharply in the coming years.

3. Evaluation: Design, methods and implementation

3.1 Sampling and randomization

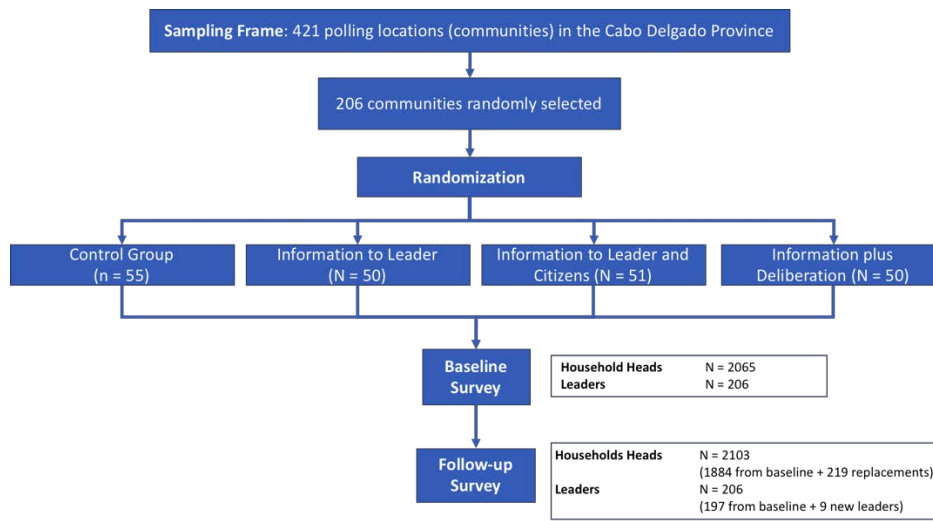
We study a sample of 206 communities. These communities were randomly drawn from the list of polling locations in the province of Cabo Delgado that were present across both the 2009 and the 2014 general elections,³ and that had more than the number of voters corresponding to the 5th percentile of that distribution (corresponding to 207 voters per polling location). The polling locations were located within the following 16 districts: Ancuabe, Balama,

³ 54 polling locations across the two elections were dropped because they were not operating in both elections.

Chiure, Macomia, Mecufi, Meluco, Metuge, Mocimboa da Praia, Montepuez, Mueda, Muidumbe, Namuno, Nangade, Palma, Pemba, and Quissanga.⁴

In our final sampling frame, we had 421 polling locations, with 14 in urban areas and 39 in semi-urban areas. Figure 3 presents the procedure followed for sampling of communities and participants.

Figure 3 – Flowchart for the sampling procedure



Note: the flow chart presents the procedure followed for sampling of communities and for the surveys.

We stratified the sampled communities by the two urban areas (Pemba and Montepuez), semi-urban communities (i.e., the main *posto administrativo* in each district) and rural communities. Since we aimed for a sample of 200 communities: in urban strata, we selected 8 polling locations in Pemba and 4 polling locations in Montepuez; in semi-urban strata, we selected 2 polling stations per town (1 if only 1 was available); the remaining 165 stations were sampled from all other polling stations. We then built blocks of four communities using m-distance (Mahalanobis) relative proximity. To construct m-distances, we make use of the richness of baseline information we have, including household, leader, and community characteristics.

After forming blocks of similar communities, we randomly allocated each community in a block to either one of the treatment groups or a control group, which had no information or deliberation campaigning. Each one of the four possibilities had the same probability, and we made sure each block had the four possibilities. To limit the risk of treatment contagion to other groups, at the end of this procedure, we computed the minimum distance from each community to a community in a different group. If two or more communities were closer than 3km, were control

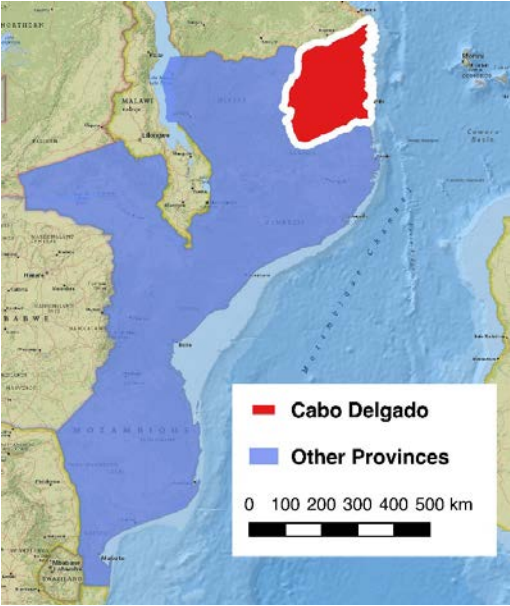
⁴ These districts represent all the districts of Cabo Delgado, except one, Ibo, excluded since it is an island. We also excluded two polling stations in another island, and the 11 polling locations in Palma's '*posto administrativo*'. The reason for the latter was to avoid areas that have been subject of recent violence related to the discovery of natural gas.

versus any treatment or Information to Leaders (Treatment 1) versus Information to Leaders and Citizens with and without Deliberation (Treatments 2 and 3), and were rural, then we selected at random one of these equidistant communities and re-assigned the same group to the others. We ended up with 50 communities for Treatment 1, 51 communities for treatment 2, 50 communities for treatment 3, and 55 communities for the control group. Disparities between the groups are due to the fact that we included 9 substitute communities. Results are robust to the exclusion of these substitute locations. Figure 4 presents the geographical area selected for the study.

Sampling of citizens within communities was the product of random walks during the baseline survey. Enumerators were told to select houses by departing in different directions from the centre of the community as defined by the polling location. They were given a sampling interval for each community, which was a function of the number of registered voters in that community. The sampling interval defined the number of houses in between sampled houses. In each house, heads of households were sampled for survey interviews and behavioural activities. We interviewed 2065 heads of household in the baseline survey, approximately 10 per community. Post-treatment attrition was handled through substitutions in the same household, when possible.

Descriptive statistics are presented in Appendix – Descriptive Statistics.

Figure 4 – Cabo Delgado Province



Note: in red the selected province for the project. Basemap: ESRI©.

3.2 Measurement

The structure of the measurement in this project included (i) baseline and end line surveys at the household, local leader, and community levels, (ii) the holding of structured community activities (SCAs) aimed at gathering behavioural data (post-treatment), and (iii) the implementation of lab in the field experiments (post-treatment).

Our measurements are such that subjects were aware of being observed. This means that demand or Hawthorne effects, i.e., the possibility that subjects bias their behaviour to comply with observer expectations, are difficult to rule out completely in this evaluation. However, we supplement survey-based measurements with behavioural measurements to reduce the risk that survey-based measurements alone could be biased by Hawthorne effects. In fact, behavioural measurements, including lab games and SCAs, incentivize unbiased behaviour, unlike typical survey measurements. Similarly, John Henry effects, i.e., the possibility that control groups are aware of their condition and could bias behaviour as a consequence, are also minimized by supplementing survey-based measurements with incentivized behavioural measurements. In addition, to minimize the risk of John Henry effects we have also implemented a minimum distance procedure across communities in different treatment groups (see Appendix. Sample Design). The use of observed behaviour is also providing additional support to the stated-preference type of information collected through surveys, which is at higher risk of suffering from different reporting biases.

The baseline data was collected in August-September, 2016. Some SCAs were initiated immediately after the treatment activities in March 2017. The end line survey, lab experiments, and the completion of SCA activities happened in the period August-November, 2017. We now turn to the details of the design of each type of measurement in this experiment.⁵

3.2.1 Surveys

The household questionnaire was answered by the household head and included questions on the demographic traits of the respondent and his/her household, knowledge relating to natural resources, aspirations, trust, social capital and networks, and political views. The leader questionnaire had a similar structure. The community questionnaire included questions on the existence of different types of local infrastructures and natural resources, distance to markets, local associations, community meetings, and local political structures. This questionnaire was answered by small groups of (self-selected) community representatives. Most questions in all three questionnaires were present in both baseline and end line.

3.2.2 Structured community activities

We now turn to Structured Community Activities (SCAs). These follow the nomenclature of Casey et al. (2012), who consider SCAs to be ‘concrete, real-world scenarios that allow unobtrusive measurement of leader and community decision-making, more objectively than lab experiments, hypothetical vignettes, or surveys⁶. We divide SCAs between those submitted to local leaders and those submitted to citizens. We implement versions of the three SCAs in Casey et al. (2012) as well as some new additions, as described below.

- *Leader: zinc roof tiles.* In this activity, we endeavour to measure elite capture of resources. The community leader was given eight zinc roof sheets and told that they were ‘to be used in a way that benefits the community.’ Each zinc sheet was worth approximately 300 Meticaï, a total value of 2400 (35 USD).⁷ The leader was given the

⁵ Note that the design of this experiment and corresponding measurements was included in a pre-analysis plan registered on the AEA RCT registry (AEARCTR-0002493).

⁶ The SCAs have been carefully designed after an extensive activity of piloting in the field before the beginning of the baseline survey.

⁷ In our sample, at baseline, household income is roughly 4150 Meticaï per month.

zinc sheets in private, as the person representing the community, and the activity was not announced publicly to the rest of the community. Leaders were told they had until the end of August 2017 to use the zinc sheets, otherwise they would be redistributed to other needier communities. A version of this activity was implemented in Casey et al. (2012). At the time of the end line visit to each community, we asked to see each one of the zinc sheets and recorded how it was being used. The outcome of interest of this activity involved how the zinc sheet was being used, i.e., for private or public benefit, as well as the identity/characteristics of the holder of each zinc sheet. We thus interpret the use of the zinc for private purposes as a measure of elite capture.

- *Leader: funds for meetings.* In this SCA we examine another form of elite capture, i.e., whether leaders appropriated funds that had been set aside to cover food items for the community members during their meetings. Community leaders were given 400 Meticais (6 USD) and were requested to use the funds in order to purchase the food items. We observed how many food items were purchased, and inquired at the nearest store the cost of each item. Our main outcome of interest is thus the difference between the 400 Meticais and the amount spent on food items, i.e., the amount appropriated by the leader.
- *Leader: appointing a taskforce.* This SCA was intended to measure propensity for favouritism in how leaders choose individuals for specific tasks. In this case, the leader was asked to select five individuals to be submitted to a Raven's test. The Raven's test is a nonverbal test used in measuring abstract reasoning and regarded as a means of estimating intelligence, particularly in settings of low literacy. Our version was composed of 10 questions, each of which asking respondents to complete a logical sequence of images. Leaders were told that, conditional on the performance of the five selected individuals on the test, they could earn a monetary prize of 1000 Meticais (14 USD) for their community. Specifically, if all of the five individuals get at least five of the 10 questions correct, the prize would be awarded. In addition, leaders were also told that, for participating in the activity, each selected individual was given a show-up bonus of 100 Meticais. Our measurement is thus the performance on the test of the five selected individuals. Additionally, since all surveyed household representatives also took the Raven's test at end line, we have an estimate of the average score for the community. We are thus able to observe a continuous measure of how appropriate the leader's choices are, relative to the community. We also observe basic demographic characteristics of those individuals selected by the leader, as well as their relationship to the leader.
- *Leader and community: auctions.* In this SCA we wanted to have a measure of the propensity of both leaders and citizens to engage in potential rent-seeking activities. To get at this question, we conducted an auction that could be for one or two activities. The first activity was a meeting with the district administrator (the main politician at the district level, the administrative level below the province), including lunch and costs of transportation. This activity was thought to provide an environment conducive to possible rent-seeking activities, though there may be other potential benefits. This was the activity available to both local leaders and community members. The second activity was related to an activity of entrepreneurship, and was intended to provide a productive alternative to the first. This activity consisted of a training session on poultry

farming (creation and management of a business in this area), including lunch and transportation. Only community members participated in this auction.⁸ Each player in these auctions was endowed with 100 Meticaïs. When asked to bid for both activities, only one of them would later be randomly selected for implementation. Thus bidders (citizens) had an incentive to bid independently for each of the two activities. To ensure incentive compatibility of the auctions (i.e., so that individuals revealed their true willingness to pay (WTP) for each activity), the Becker-DeGroot-Marschak (BDM) mechanism was used. A set of prices was placed in a box, and after the individual had stated their WTP, the actual price was drawn at random. If the WTP was greater than the price, then they were forced to purchase the activity, at the drawn price. If not, they did not pay anything, and did not purchase the activity. This was repeated for the two auctions in the case of community members, with one being chosen by the toss of a coin afterwards. All bidders in all auctions were allowed to bid more than 100 Meticaïs, and were truthfully told that there could be prices over 100 in the box. The primary outcomes of interest for this activity are the amounts bid in the auction to meet the district administrator, and in the case of community members, the difference in the amount bid for the meeting with the administrator and the entrepreneurial activity.

- *Community: matching grants.* The motivation for this SCA is the measurement of social cohesion and contribution to local public good provision. We gave communities the opportunity to raise funds towards a community objective. Funds were matched at a rate of 50 percent until a maximum of 2500 Meticaïs (35 USD), if the community raised 5000 Meticaïs or more. Specifically, we asked communities to form a committee that would raise and keep the individual contributions until August 2017. This committee was offered a book to keep the records of contributions. At the time of the end line visit to the communities, the amounts raised by the communities would be verified and the corresponding matching grant would be given. This activity was close to an SCA implemented in Casey et al. (2012). For this matching activity, each community had an official meeting to discuss whether to participate in the matching activity, and, if yes, which objective the community had for the funds raised under that activity. We therefore collected further behavioural outcomes related to the functioning of the meeting for the matching activity. Each meeting was observed in detail by enumerators, who recorded attendance, characteristics of participants, decisions taken, and method of decision-making. The main outcomes of interest for these meetings are participation and whether the meeting was conducted democratically.

3.2.3 Lab in the field experiments

In addition to traditional survey measurements and the SCAs, we conducted a number of lab in the field experiments, to further measure behavioural preferences in a controlled framework.

In particular we implemented four types of lab experiments in our intervention: (i) a trust game, (ii) a rent-seeking game, and (iii) a public goods game. The trust and the public goods game are fairly standard in the experimental and development literature, while the rent-seeking game is novel. All games involved the participation of all 10 community members surveyed. The

⁸ The meetings with administrators and the training happened in November-December, 2017.

trust and rent-seeking games also included the community leader as a player. The sequence of play was randomized in each community.

- *Trust Game.* The trust game involved 10 participants from the community (citizens) and the community leader. The version played corresponds to a standard trust game. Each citizen was given an endowment of 100 Meticaïs in the form of 10 tokens worth 10 Meticaïs each. They had to decide to keep this income for themselves or send a proportion to the leader. The funds sent to the leader were tripled. The leader then had to decide how much of this tripled amount to give back to the citizen. For the leaders' decision, we used the strategy method, that is, we asked the leader for every possible amount sent from 1 to 10 tokens (which became 1 to 30), how much the leader would like to send back to the citizen. The game also included a punishment option at the end, before any decisions or outcomes were revealed. Specifically, this punishment option was phrased as: 'Imagine the leader sends back less than 50 Meticaïs, after having received 150 Meticaïs. Do you want to punish the leader? Punishment costs 10 Meticaïs and reduces the payoff of the leader by 30 Meticaïs.' All citizens were paid according to the leaders full set of decisions, while the leader's payoff was determined by being randomly matched with one individual from the community. We also elicited beliefs in this game, as citizens were paid 10 Meticaïs each if they correctly estimated the amount that the leader would return after having received 150 Meticaïs (corresponding to 50 Meticaïs sent). This trust game measures elite capture from leaders, as well as trust in local leaders and demand for accountability from citizens.
- *Rent-seeking game.* The rent-seeking game is a novel lab in the field experiment. It is intended to measure the willingness to engage in rent-seeking behaviour at the expense of a more productive activity. The participants are the 10 citizens and one leader. Each citizen was given an endowment of 10 tokens worth 10 Meticaïs each, for a total of 100 Meticaïs. Next, each citizen had to choose how many of the 10 tokens to send as a 'gift' to the leader (rent-seeking), with the remaining units being 'put aside' (for a productive purpose). The leader had to choose one citizen after observing the behaviour of all of them (note that the leader never observed the identity of the individuals, only the amounts sent). In the case of a citizen not chosen by the leader, the units he/she sent as a gift accrued to the leader, while the units put aside stayed with the citizen. In the case of a citizen chosen by leader, the leader received the units put aside in addition to the gift sent, while the citizen received a bonus of 300 Meticaïs for being chosen. In summary, the leader receives all units sent as gifts. Additionally, the leader receives the units put aside by the person he/she chose. Thus, the leader has a dominant strategy, which is to choose the person who set aside the most funds (the most ambitious entrepreneur). Knowing this, individuals' best response is to put aside all of their endowments and do no rent-seeking at all. We also collected belief data in this game, as citizens were asked how they expected the leader to choose. They were asked specifically how many tokens the person the leader chose would put aside. This is equal to 10 minus the number of tokens that were sent as a gift to the leader by the chosen person.
- *Public goods game.* The public goods game measures social cohesion and contribution to a common goal. The version we implemented was standard and involved 10

participants from the community, always excluding the leader. Each individual was given an endowment of 100 Meticaais in 10 tokens of 10 Meticaais. They had to decide whether to keep this income for themselves, or contribute towards a public account. All contributions in the public account were doubled, and divided back equally to all 10 individuals, independently of their contribution. Thus, the marginal per-capita return (MPCR) to contributing is 0.2, which is on the lower side of public goods experiments. Belief data was also elicited, as individuals were told that one person had been selected at random (not them) and that they would receive 10 Meticaais extra if they guessed correctly the amount contributed by that person.

3.3 Empirical Strategy

We adopt standard specifications for the analysis of experiments. Specifically, we employ two types of specifications, depending on the existence of baseline data. We consider outcome variables defined as Y_{ij} , i.e., for location j and individual i . Individual i can be a local leader or a citizen. Outcomes defined at the community level are treated in the same way as outcomes defined at the level of the local leader.

The first specification, when baseline data are not available, is:

$$Y_{ij} = \alpha + \beta_1 T1_j + \beta_2 T2_j + \beta_3 T3_j + \gamma Z_j + \delta X_{ij} + \epsilon_{ij} \quad (1)$$

where $T1_j$, $T2_j$ and $T3_j$ are indicator variables for living in a community in treatment groups 1, 2, and 3, Z_j is a set of location control variables including strata dummies and community characteristics, X_i is a set of individual characteristics, either for leaders or citizens depending on the outcome at stake, and ϵ_{ij} is an individual-specific error term which we cluster at the community level to account for correlated errors within the community. *Community characteristics* include district and stratum (rural, semi-urban, or urban) indicator variables, an infrastructure index measuring the presence of public goods in the village, presence of natural resources in the village, presence of a market in the village, number of voters (measured by the number of tables at the polling station), and distance to the city of Palma. The infrastructure index is built by averaging 14 indicator variables for the presence in the village of a kindergarten, a primary school, a lower secondary school, a high school, a health centre, a facilitator, a water pump, a market, a police station, a church, mosque or temple, an amusement area, a room for community activities, and for the access to electricity and to the sewage system. The presence of natural resources in the village is built by averaging 10 indicator variables for the presence in the community of limestone, marble, sands and rocks, forest resources, ebony and exotic woods, gold, charcoal, graphite, precious and semi-precious stones, mercury, fishing resource, salt and natural gas. When analysing leader-level outcomes, we remove district indicators to avoid collinearity with stratum indicators. *Citizens characteristics* include gender and age of the household head, household size, education, religion, and ethnic group indicators, indicator variable for whether the respondent is born in the village and indicator variables for ownership of radio and television. Leaders characteristics include the same variables but measured at the level of the community leader.

The second specification, when baseline data are available, is:

$$Y_{ijt} = \alpha + \beta_1 T1_{jt} + \beta_2 T2_{jt} + \beta_3 T3_{jt} + \gamma Z_{jt} + \delta X_{ijt} + \theta Y_{ijt-1} + \epsilon_{ijt} \quad (2)$$

where Y_{ijt-1} is the baseline value of the dependent variable. McKenzie (2012) supports that this specification maximizes statistical power in experiments, if autocorrelations of outcome variables are low. This is arguably the case for most survey outcomes, which are subjective. In our estimations below, we employ OLS in all regressions, even those with binary outcomes (i.e., linear probability models) and test for the null that the coefficients of each pair of treatments are equal.⁹

4. Programme or policy: Design, methods and implementation

4.1 The Information Package

After the collection of the relevant information to share with the communities and before the project implementation, the implementing partners created a manual that served as a guide for the intervention. The information being distributed includes the type of resources discovered, plans for exploration, and the legal rights of the communities involved. The final content of the intervention is being discussed and approved by all NGOs and governmental authorities involved in the project in order to guarantee widespread support and neutrality. Although this is a very time-consuming process, we believe it to be a fundamental step for the credibility of the project and to achieve interesting and usable findings for policy makers.

The research team, in collaboration with the implementing partners, decided to extend the content of the information dissemination not only to natural gas, but to natural resources in general and to other resources present in the Province. The reason is that many communities in the sample are identically exposed to the exploitation of other resources, while the concept of natural resource is not present in many communities.

The information package, and consequently the community meetings where the information was provided to the community, was divided in the following sections:

- 1) **Presentation** – an introductory space for those who were holding the meetings in the communities to present themselves and the implementing partners and to introduce the subject of the meeting. It was also a moment for the village leader or any other influential person to explain to the community about the content and objective of the meeting.
- 2) **Introduction** – in this section it was explained that Mozambique is a country with many occurrences of natural resources. The industries of natural gas, coal, iron, precious stones and heavy minerals are in big expansion. The extractive industries offer potential for investment and creation of wealth. It was also introduced for the first time the importance of the natural gas reserves discovered in the Rovuma Basin as according to the IMF, during the 2020s, the natural gas industry will account for half of the country's wealth. Data shows that the revenues generated by this extraction may heavily influence the future of the Mozambican economy, making Mozambique one of the world's potential gas producers.
- 3) **Natural Resources** – this section included information about the formal definition of natural resource, and the difference between renewables and non-renewables. This

⁹ Results are robust to estimating equations (1) and (2) removing the control variables and controlling only for the strata dummies.

explanation was important for the communities to understand that many of their resources, including natural gas are non-renewables and therefore a sustainable exploration is fundamental. Later, it was explained that a sustainable resource management and exploration of the resources should benefit present generations in an equitable way, as well as the future generations. It should also provide economic and social development while taking into account the environment.

- 4) **Types of Natural Resources** – this section presented the types of natural resources that have a bigger presence and impact in Cabo Delgado. Specifically, Mineral Resources, Forest Resources, Fishing Resources and Natural Gas were discussed.
- 5) **Natural Gas** – this section presented the plans for the exploration and transformation of natural gas in the Rovuma Basin, which will happen within the next years, followed by what natural gas is and what it is used for. The teams also explained where in Cabo Delgado it was discovered and when the exploration is planned to start. At the end, it was also mentioned that another province in Mozambique, Inhambane, discovered natural gas in the past and what lessons can be learned from that experience.
- 6) **The importance of natural resources for citizens** – this section aimed to shed light on what local can expect from the exploitation of the resources. It was explained that it can be a source of income for the families (this is, used in regular terms for subsistence); it can also create formal and informal jobs; it is supposed to increase the level of technical expertise of both workers and students who want to have jobs in the area; the extractive companies operating in the local communities should be aware of their social responsibility towards the citizens; finally, the governmental entities should share part of the benefits with the communities affected by the resources – this can be made in a monetary way or in a more indirect way by investing in the communities most needed areas.
- 7) **Practical examples** – After explaining how communities can be involved in this matter, three examples of countries that discovered natural resources were discussed, especially how they were affected by its discovery. Two of the examples were positive (*Norway* and *Botswana*), while the other one was negative (*Nigeria*). These examples served the purpose of enlightening the citizens to desirable and undesirable consequences that can arise from the discovery of natural resources.
- 8) **Conclusion** – In the end, it was emphasized the main lessons to take from the meeting, and it was concluded with a brief review of what had been explained before. Although the villagers were allowed to raise questions along the meeting, this is usually the time when most people wanted to express their opinion about the topic.

Figure 5 – The Information Flyer

QUE RECURSOS NATURAIS EXISTEM EM CABO DELGADO?

- GÁS NATURAL
- PEDRAS PRECIOSAS
- MADEIRAS
- GRAFITE
- PESCA
- FAUNA & FLORA

PORQUE É QUE OS RECURSOS NATURAIS SÃO IMPORTANTES?

- FONTE DE SUBSISTÊNCIA PARA AS FAMÍLIAS;
- CRIAÇÃO DE EMPREGO DIRECTO E INDIRECTO;
- AUMENTO DA EDUCAÇÃO/FORMAÇÃO;
- PROJECTOS SOCIAIS POR PARTE DAS EMPRESAS EXPLORADORAS.

Projecto desenvolvido por:



CAPACITAÇÕES SOBRE RECURSOS NATURAIS

Em colaboração com:





RECURSOS NATURAIS EM CABO DELGADO



AS COMUNIDADES DEVEM ESTAR PREPARADAS

E informadas sobre os seus direitos e deveres

Direito à responsabilidade social das empresas
Resolução nº 21/2014 - Artigo 3

Direito a parte das receitas serem investidas localmente
Lei das Minas - Artigo 20
Lei nº 10/99 de 7 de Julho - Artigo 102
Lei das Pescas, artigo 23

Direito ao emprego
Decreto-Lei nº2/2014 - Artigo 18

Direito a educação/formação
Decreto-Lei nº2/2014 - Artigo 19

Direito a uma justa indemnização
Lei do Ordenamento do Território (Lei nº19/2007) - Artigo 22

PREVISÃO DE QUE A ECONOMIA MOÇAMBIQUANA PODE CRESCER ATÉ 24% DURANTE 2021-2025*

Crescimento da Economia em 2015 vs 2021-2025:



2015: 6.6%
2021-2025: 24%
*Previsões do FMI



Direito à informação
Lei do Ordenamento do Território (Lei nº19/2007) - Artigo 21

Direito à participação
Lei do Ordenamento do Território (Lei nº19/2007) - Artigo 22
Lei de Minas - Artigo 32



Note: on the left side, a picture of a village leader reading a flyer, while on the right it is a moment of the distribution of the flyer to the community members. Credit: NOVAFRICA.

4.2 Community Meetings

The community meetings were held by a team of at least three members specially trained for the purpose and it followed the information package mentioned before. Figure 6 presents some moments during the Community Meetings. At the end of the presentation, to ensure that those who attended the meetings understood the main messages, the team presented a 10-minute play. The play presented a live impersonation of a community theatre, played by a team of three actors. The play represented a traditional family discussing the management of natural resources after hearing the news about the discovery of natural gas in the radio. A local theatre company in collaboration with our research team wrote the script. The purpose of the play was to share the information in a colloquial way in order to enliven the atmosphere while explaining important matters. After the play, it was distributed to each person a flyer that included synthetic information on the main topics.

Illustrations were made by hand by a local artist. The flyer is mostly visual and has the main takeaways of the information campaign. It was hand-delivered in each treatment community to the leader (for groups 1, 2 and 3) and to the community members (for groups 2 and 3). The flyer is presented in Figure 5.

At the end of the meeting, the leader and the 10 baseline respondents were asked to answer a short-questionnaire to test their learning. All the community meetings were implemented without major problems and the villagers were in general very interested in the subject and eager to speak their minds. The meetings took approximately between 1 hour and 1 hour and a half. The team members supervising the organization of the deliberation meetings were fluent in the local dialects, which could differ from village to village.

On average, there were approximately 64 people per village attending the community meetings and receiving the information. When asked how they knew that a meeting was going to take place, the majority of them received a personal invitation (75.74%), while the village leader invited 19.3%.

4.3 Deliberation Treatment

For the villages belonging to the third treatment group, which includes the deliberation process, the attendants willing to participate would gather in groups. The following procedure was followed.

Firstly, during the community meeting, it was asked which attendants would like to participate in the deliberation. The implementing team would explain that the objective of the deliberation is to select 3 areas needing more investment in their villages in the case in the future they will start to receive rents from the exploration of natural gas. The results would then be shared with the local government. Then, at least 3 groups of 5 people were created, with the number of groups differing according to the total amount of people participating in the process. Participants would then gather in groups and chose the 3 main areas.

The voting process was randomly selected in: raising hands, where after discussing the possible areas, voters would have to vote by raising their hands for the areas they think are most in need; secret vote, where each person would secretly vote for the first, the second and the third area of interest; normal method, where no restrictions were imposed. One team member would explain the process and register their votes.

5. Timeline

Figure 6 presents the timeline of measurements and of the intervention activities.

Figure 6 – Timeline of Activities

Activity	2016			2017											Year Month		
	8	9	10	11	12	1	2	3	4	5	6	7	8	9		10	11
Baseline survey	■	■	■														
Intervention				■	■	■	■	■									
SCAs								■	■	■	■	■	■	■	■	■	■
Follow-up survey														■	■	■	■
Behavioural games																	■

6. Impact analysis and results of the key evaluation questions

We begin by referring to balance checks in our experiment. In the Appendix to this report (Table 16), we show descriptive statistics and differences between the control group and all treatments bundled together under a dummy variable, and between the control group and each one of the treatment groups. These differences concern a number of household, leader, and community characteristics, as collected in our baseline surveys. We also depict joint F-tests of the null that the three treatments are jointly equal to zero. Of the 63 individual significance tests relating to each treatment intervention, only one come out significant at standard levels: less years of schooling for leaders in Treatment 3.¹⁰ No joint significant tests yield a rejection of the null at standard levels. We can conclude that our randomization procedure was effective at identifying comparable groups in our experiment.

Table 16 also provides us with a simple characterization of the demographic traits of our sample (control group averages): 27 percent of our baseline household representatives are female, average age is 45 years old, 11 percent have secondary education or higher, 56 percent are Muslim; local leaders are almost all men (only 4 percent are female), average age is 54 years old, and average years of schooling is 6 years; 9 percent of our sample is located in urban areas, and 11 percent in semi-urban areas.

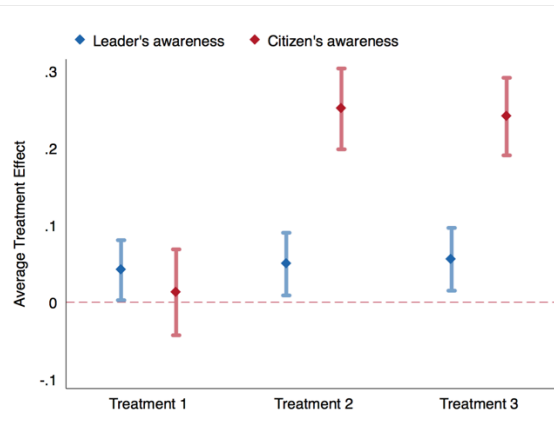
6.1 Information

In terms of treatment effects, we begin by focusing on the effect of the interventions on the awareness and knowledge of the natural gas discovery among local leaders and among citizens. For both groups, we focus on a similar set of outcomes, presented in Table 2 and Table 3, respectively, and also summarized in Figure 8. Note that, when baseline values of the outcome variable are available, we display regressions controlling for those values (specification 2 above) side by side the ones just employing standard control variables (specification 1 above). In columns (1) and (2), we focus on awareness of the natural gas discovery. Awareness is measured using an indicator variable equal to 1 if the respondent has

¹⁰ It is possible that less-educated leaders in Treatment 3 could lead to differential treatment effects. We therefore control for leaders' education in all our specification. It is important to note that inclusion or exclusion of the control do not affect our estimates.

ever heard about the natural gas discovery and zero otherwise. In column (3) and (4), we focus on the level of knowledge about the natural gas discovery. For both leaders and citizens, we build an index by averaging 15 indicator variables concerning knowledge of whether the government is receiving revenues from natural gas extraction, about the firms involved, and about the location of the discovery. Each indicator variable is equal to 1 if the respondent gives a correct answer, and 0 otherwise. The index is therefore equal to 1 if the respondent has full knowledge of these elements, and zero if the respondent reports all answers wrongly or whether he has never heard about the discovery. In column (5) and (6), we measure the effect on salience, as measured by asking the respondent about the three major events in the district in the last 5 years and leaving the answer open. We then perform content analysis and we build an indicator variable equal to 1 if the respondent used the word 'gas' and zero otherwise. In columns (7) to (9), we restrict attention to respondents reporting that they are aware of the natural gas discovery. In column (7), we focus on self-reported level of knowledge, by asking the respondent how informed he feels about the natural gas discovery. The outcome is measured in a scale from 1 to 4, where the value 4 indicates that the respondent reports being fully informed. Finally, in columns (8) and (9), we focus on the perceived benefits from the natural gas discovery for the community and the household of the respondent. These are indicator variables equal to 1 if the respondent agrees or fully agrees that the discovery of natural gas will create a benefit for his community or his family, and zero otherwise.

Figure 7 – Average Treatment Effect on Natural Gas Discovery Awareness



Note: confidence intervals are built using a 95% of confidence. Standard errors are clustered at community level. The dependent variable is awareness of the natural gas discovery, an indicator variable equal to 1 if the respondent reports having heard about the natural gas discovery and 0 otherwise.

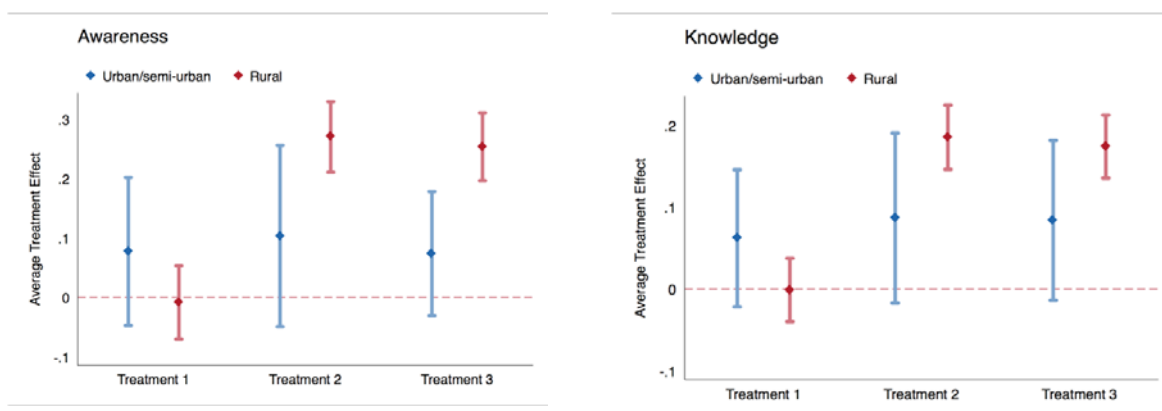
We now turn to the analysis of results. We begin with the effect of the interventions on leaders' awareness and knowledge about the natural resource curse (Table 2). First, awareness is increased by roughly 4-6 percentage points across all treatment groups. This suggests that the information campaign was indeed effective in raising awareness by distributing information to the village leader, especially given the already high level of awareness among the elite. We do not observe a differential effect when information is also targeted at citizens and when deliberation is organized. Knowledge about the discovery also increased significantly across all treatment groups (4-6 percentage points), suggesting that the information campaign had impact not only in terms of awareness, but also in terms of knowledge about the details of the discovery. Relatively small effects in knowledge translated into large effects in terms of salience, but only in communities where the information was also distributed to citizens,

suggesting changes in salience across leaders might be associated with the level of information among citizens. In Treatments 2 and 3, between 32-34 percent more leaders used the word 'gas' to describe one of the major events in the district in the last 5 years. When turning our attention to the perception of knowledge and to the perceived benefits from the discovery for the community and the household of the leader, we do not observe any significant effect.

We then focus on citizens' outcomes (Table 3). The intervention created a large increase in awareness of 24-25 percentage points, only when the information is distributed to citizens. We do not observe an effect on citizen's awareness when the information is distributed to the leader only, suggesting that leaders did not introduce any clear within-community effort for distributing the information to the citizens. Treatments 2 and 3 did not only increase awareness, but also made citizens more knowledgeable about the details of the discovery: the knowledge index increased by around 17 percentage points across both treatment groups. Similar to awareness, we do not observe any effect of distributing the information to the community leader on citizens' knowledge. In terms of salience, we observe a significant increase in all treatment groups, with a significantly larger effect for Treatments 2 and 3. In Treatment 1, around 6-7 percent more of citizens used the word 'gas'. This suggests that information targeted at leaders is mainly increasing salience among citizens that were already aware of the discovery at baseline, perhaps in closer connection to the leader's network. In fact, when restricting our attention to citizens that are aware of the discovery, we observe a higher (self-reported) degree of knowledge also when the information is only targeted at the local leaders. Differently from leaders, Treatments 2 and 3 lead to a significant increase in the way citizens believe the natural gas will bring benefits to their community and their household. This is not observed when information is targeted at leaders only.

In summary, we can see clear effects of the treatments on awareness and knowledge of the natural gas discovery. This is particularly the case for Treatments 2 and 3, for both leaders and citizens. Treatment 1 also has effects on awareness and knowledge of leaders, and on salience and self-reported knowledge for citizens. Citizens also become optimistic regarding the future benefits of the discovery for the community and their corresponding households, but only when the information is targeted at the whole community. This effect is mainly driven by rural communities, while in urban and semi-urban communities estimates of the effect are noisier and not significant, even if they are positive in all treatment groups (see Figure 9).

Figure 8 – Heterogeneous effects of the Information Treatments



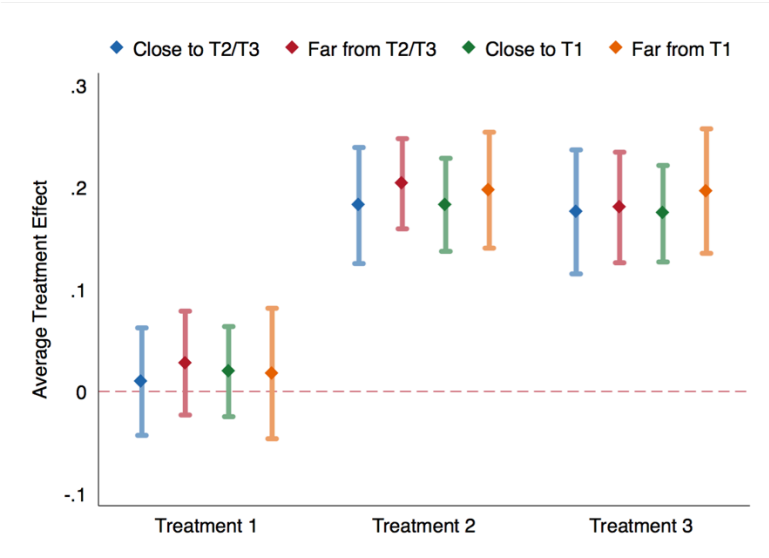
Note: confidence intervals are built using a 95% of confidence. Standard errors are clustered at community level.

While the design of the experiment allowed treatment units to be separated in distance to avoid information spillovers (see Section 3.1), we cannot exclude that information spread across villages beyond the distance imposed by the researchers. In this case, our estimates would be capturing the effect of the diffusion of information through local knowledge networks in addition to the effect of the provision of information. To test this hypothesis, we looked at whether the effect of treatments on the knowledge of the natural gas discovery among citizens differs in communities that are closer or more distant to communities in which the information was provided to a village leader only (Treatment 1) or to citizens also (Treatment 2 and 3).

To this purpose, we split the sample in communities close to (far from) another community in Treatment 2 or Treatment 3 and in communities close to (far from) another community in Treatment 1. We define being close to or far from using the sample median of the minimum distance to another community of these types. Median distance to either Treatment 2 or 3 is 9.65 km and to Treatment 1 is 12.01 km.

We then estimate the effect of each treatment for each sub-group. Figure 10 presents the results. We exclude the presence of large spillover effects since estimates are not statistically different across sub-groups.

Figure 9 – Information and Spillovers



Note: “Close to” and “Far from” are based on the sample median of the minimum distance of a community to another community in Treatment 2 or 3 and in Treatment 1. We split the sample in communities closer to the median minimum distance (“Close to”) and further away (“Far from”). Median distance to either Treatment 2 or 3 is 9.65 km and to Treatment 1 is 12.01 km. Confidence intervals are built using a 95% of confidence. Standard errors are clustered at community level.

6.2 Elite capture

Table 4 presents estimates of the effect of the three treatment interventions on measures of elite capture, namely by local leaders. In columns (1) and (2), we focus our attention on attitudes against corruption from the leader surveys. We build a measure for these attitudes by averaging two indicator variables from available questions measuring corruption. Firstly, an indicator coded as a one if the leader disagrees with the statement ‘the best way to overcome problems in public services is to pay bribes’. Secondly, an indicator coded as one if the leader

prefers demanding the Governor of the Province a benefit for the community rather than job for himself. The exact text of the question reads as follows: *'Imagine that you had the opportunity to have a meeting with the Governor of Cabo Delgado and that you could make a request. Please tell me what you would ask'*. The measure of attitudes against corruption picks value zero if the leader is strongly in favour of corruption and one in the opposite situation. This is the only outcome variable in this table for which we have baseline values of the outcome. Column (3) is devoted to the zinc roofs SCA, namely we use a variable averaging across all zinc sheets received by a leader, with the value for each one defined as -1 if the zinc is used privately, 0 if the zinc is not used, and 1 if the zinc is used for community purposes. Columns (4) and (5) are dedicated to the funds for meetings SCA through which leaders received funds to organize meetings. Column (4) shows an outcome indicator variable defined as 1 if the leader spent all funds received for the meetings. Column (5) displays a variable defined as the amount spent in the meetings (in Meticaís).¹¹ Columns (6) to (9) show several outcome variables related to the SCA where the leader appointed a taskforce. Column (6) employs the average score in the Raven's test for the selected taskforce. Columns (7) and (8) use indicator variables constructed for the first quintile and for the second to fourth (respectively) in the distribution of the difference between the average score in the taskforce and the average score among citizens in the community. The regressions in column (9) take the share of women selected in the taskforce appointed by the leader.¹² Column (10) regards leader behaviour in the Trust Game (TG), i.e., the amount (in game units) the leader returned after receiving the transfer from a citizen in the trust game.¹³

Leader attitudes in favour of corruption increase significantly with Treatment 1. When information is targeted only at leaders, attitudes against corruption are reduced by 10 percentage points. The coefficient is also negative for Treatment 2 and Treatment 3, with a marginally significant effect for Treatment 3 (7 to 8 percentage-point effects). Differences across treatments are found not to be significant. The SCA on zinc roofs does not yield any significant differences. However, we note positive point estimates, which are smallest for Treatment 1 and largest for Treatment 3. Turning to the funds for the meeting SCA, we find significant negative treatment effect for Treatment 1 when considering the probability of spending all assigned funds. The effect is statistically different from Treatment 2 and 3. Still, point estimates are largest in absolute values for Treatment 1 (33 percentage points) and lowest for Treatment 2 (14 percentage points). The only statistically significant effect for amounts spent in the meetings is for Treatment 1: -60 Meticaís, slightly over 10 percent of the total budget. On the SCA that involved appointing a taskforce, we also show some effects of Treatment 1 in particular. We find that Treatment 1 decreases the probability of selecting top performers (as defined by the first quintile of the distribution of the difference in Raven's scores between appointed individuals and the community) and increases the probability of selecting mid performers (in the second to fourth quintiles of the same distribution). Note that the

¹¹ The average total spent was 291 Meticaís out of the endowed amount of 400. Some leaders used their own money and spent more than 400. 34 percent of leaders spent the full amount, > 350; due to possible measurement error, we allow a margin of error of 50 out of 400 Meticaís.

¹² On average individuals in the household survey got 5 out of 10 correct answers, while those chosen by the leader performed on average worse, scoring 3.7.

¹³ Regarding the trust game, the average amount sent by citizens was 4 out of 10 tokens, indicating some degree of trusting behavior. Leader's returned on average slightly more than citizens sent, taking home on average just under two-thirds of the surplus. Aggregate leader behavior was consistent for different amounts sent by citizens.

probability of selecting top performers also decreased for Treatment 2. We also note that Treatment 1 led to a decrease in the share of women selected for the taskforce by roughly 8 percentage points. This effect is statistically different at the 1 percent level from the one of Treatment 3, which is not distinguishable from zero. On behaviour in the Trust Game, namely in terms of amounts sent back by leaders, we do not find any significant differences between comparison groups. However, we note a negative point estimate for all treatments. We can conclude for some clear effects of Treatment 1 on increasing elite capture, in terms of more benevolent attitudes towards corruption, use of funds for other than specific public purposes, and appointments of community members for public service, i.e., less meritocratic and involving a lower number of women.

6.3 Rent-seeking

We now turn to the analysis of treatment effects on outcomes related to rent-seeking by both local leaders (Table 4) and by citizens (Table 5). We begin with survey outcomes. We analyse in columns (1) and (2) in both tables an indicator value assigned value one in case the citizen knows influential people. Columns (3) and (4) are devoted to an indicator variable taking value one if the leader called influential people in the last six months before the end line survey. Columns (5) and (6) display results for number of calls to influential people in the last six months before the end line survey. These are the only dependent variables in these tables for which we have baseline values, and so the only ones where we add specifications employing those values as a control variable. In columns (7) of Table 4 and columns (7) and (8) of Table 5 we look at the auctions for meeting the district administrator (in the case of both leaders and citizens) and for business training (in case of citizens). (7) of Table 4 is built as the log amount bid for meeting the administrator. (7) and (8) of Table 5 are (respectively) the difference between the log amount bid for the meeting with administrator and the log amount bid for the local training, and the share of total bids allocated to meeting the administrator. In column (8) of 4 we consider the action of leaders in the Rent-seeking Game (RSG). Namely we code the outcome variable as value 0 if the leader behaves rationally (i.e., selects the highest amount put aside by citizens for productive purposes) and 1 if the leader accepts the highest gift in the game. The final two outcomes in Table 5, in columns (9) and (10), are devoted to citizen behaviour in the rent-seeking game: the first measures the size of the gift sent to the leader; and the second is an indicator variable taking value one when the citizen sent a gift (i.e., valued more than zero).

On rent-seeking by leaders, we do not find any statistically significant difference between comparison groups, except for a negative effect of Treatment 1 on number of calls to influential people (which disappears once controlling for baseline values of the dependent variable). All treatment effects except those on number of calls are clearly below the size of the corresponding standard error, which may be a sign of relatively low statistical power to detect effects. On rent-seeking by citizens, we find several clear treatment effects. When employing our survey measures of rent-seeking, we find significant positive effects on rent-seeking of Treatment 1 on all three dependent variables. We also find significant positive effects of Treatment 3 on the probabilities of knowing and calling influential people. In these two variables, treatment effects from Treatments 1 and 3 are indistinguishable, but significantly different from Treatment 2 in the case of knowing influential people. The magnitudes of the effects of Treatment 1 are 6 percentage points for knowing influential people, 3 percentage points for calling influential people, and 11.5 percentage points for number of calls to influential

people. Turning to the auctions, we also find significant positive impacts on the log of the difference between the bid for meeting and the bid for training, with magnitude 15 percent. These effects are statistically different from the effects of Treatment 2 and 3, for the share of the bid for meeting. Finally, in the rent-seeking game, we find a statistically significant treatment effect (at the 10 percent level) for the size of gifts sent to the leader only for Treatment 2, while we note positive point estimates across the other two treatments.

We conclude that despite no movements in rent-seeking by leaders, we observe clear and consistent increases in rent-seeking by citizens when faced with information targeting the local leaders (Treatment 1). This emerges for reported contacts with influential people, but also in the bidding for meetings with the district administrator. We also identify some scattered positive effects on rent-seeking of Treatments 2 and 3, even though most do not appear in behavioural outcomes. Effects of Treatment 1 on rent-seeking may denote movements by those close to leaders, consistent with the effects found on elite capture.¹⁴

6.4 Citizen mobilization, trust, and accountability

Our final set of results relates to citizen's mobilization, social cohesion, trust and the demand for political accountability. Table 6 presents estimates of treatment effects on measures of citizen mobilization and social cohesion. Table 7 presents estimates of treatment effects on citizen's trust and demand for accountability. Beginning with Table 6, columns (1) to (4) concern standard social capital measures based on survey questions, namely on membership of professional organizations or local committees, and participation in community meetings. We have baseline values for these outcome variables and so employ them as controls in columns (2) and (4). In columns (5) to (9), we explore the outcomes of the matching grants SCA. The first dependent variable is an indicator for awareness, i.e. whether or not the individual knew about the matching activity. The next variable in column (6) is an indicator for whether the individual reported contributing a positive amount of money toward the matching activity. The continuous version of this variable is found in column (7), in logarithms. Columns (8) and (9) are measured at the community level - the first dependent variable is attendance of the meeting, taken as the share of adults who participated from the community; the dependent variable in column (9) is an indicator for whether the community decided the outcome through voting. The regression in columns (10) examines behaviour in the Public Goods Game (PGG). The outcome is defined as the contribution to the public account in the public goods game. Average contributions in the public goods game were 4.5 out of 10 tokens, with only 6 percent contributing zero.

We find that social capital measures of membership of professional organizations and local committees increased with information plus deliberation (Treatment 3). Effects on membership of professional or local organizations are 5-7 percentage points. Regarding participation in community meetings, the results are similar. There is a significant increase in Treatment 3, and additionally the effects are significant for Treatment 2 as well. Both for membership and active participation, we can reject that the effect size is the same for Treatment 1 and 3 at the 5 percent level, indicating that citizens are more effectively mobilized in treatments where they are targeted to receive information, with the strongest effects coming from when this is bundled with deliberation. Interestingly, we find a positive effect of information to the community in both

¹⁴ It is also possible that the measures of rent-seeking used could be less appropriate for leaders than for citizens. We cannot exclude this possibility.

Treatments 2 and 3, on both awareness and participation in the matching grants SCA: this is a 9-11 percentage-point effect. In the case of awareness, we are able to reject that the treatment effects of 2 and 3 are equal to the treatment effect of 1. However, regarding participation, we can no longer reject equality of the coefficients across all treatments. On average, 70 percent of individuals report being aware of the contribution activity, while 34 percent of individuals report contributing positive amounts. The log contribution amounts in the matching grants follow a similar pattern with higher point estimates for Treatments 2 and 3 than for treatment 1. Next, we also find a statistically significant effect of Treatment 3 when considering the log number of participants in the meetings. However, once again, we are unable to distinguish this impact from the one of each of the other interventions.¹⁵ In the last regression involving the meetings SCA, column (9), we examine a dummy for whether the outcome was determined democratically, by voting. Here there is a significant positive impact only for Treatment 3. The effect corresponds to slightly over a 6-percentage point increase in the likelihood that the outcome was determined by voting. Finally, column (10) presents the outcomes of contributions to public goods. We find no significant effects, despite the fact that point estimates are highest for Treatment 3.

Turning to Table 7, in columns (1) to (9), we employ survey outcomes on trust, voice and accountability, and violence. Columns (1) and (2) display the average of all self-reported measures of trust, i.e., trust concerning family, neighbours, local leaders, local people, the district government, the provincial government, Mozambicans, and national leaders. We use baseline values of the dependent variable in column (2). In columns (3) to (5) we analyse self-reported trust in the community leaders personally known by the respondent, in the provincial government, and in national leaders (respectively). The scale employed in all self-reported questions on trust ranges from 1 (do not trust at all) to 4 (trust a lot). In columns (6) and (7) we explore the self-reported levels of voice citizens have with provincial and national leaders (respectively), with scale ranging from 1 (no voice at all) to 4 (full voice). The regressions in columns (8) and (9) concern violence: the first dependent variable is defined as an indicator variable equal to one if the citizen believes violence is justified to defend a cause; the second variable is defined as an indicator variable equal to one if the respondent witnessed any verbal violence in the three months before the end line survey. The final two columns of Table 7 are related to behaviour of citizens in the Trust Game (TG). The outcome variable in column (10) is the amount sent by the citizens in the trust game, and the one in column (11) is an indicator variable taking value one if the corresponding citizen has the desire to punish the leader in the trust game.

We observe clear effects on average trust, namely negative effects of Treatment 1, with magnitude of 2 percentage points, and positive effects of treatment 2, with magnitude between 2 percentage points. These treatment effects are statistically different from each other, as is the treatment effect of information to the community (Treatment 2) from the one of information plus deliberation (Treatment 3). We find positive effects of Treatments 2 and 3 on trusting known community leaders: these are both close to 6 percentage points of the subjective scale. Trust in the provincial government behaves similarly to average trust, with a significantly higher effect for Treatment 2 than for the other treatments. We observe a significant positive effect of Treatment 3 on trusting national leaders - this is, however, indistinguishable from the other

¹⁵ The average meeting size was 43 individuals, ranging from 9 to one community, which reported 600. We account for village population in the dependent variable.

treatment effects. Turning to voice questions, we identify a larger treatment effect for Treatment 2 than for Treatment 1 when considering voice at the provincial level. Treatment 2 becomes statistically significant when employing voice at the national level: its magnitude is 11 percentage points of the subjective scale. When analysing the questions on violence, we find a higher point estimate for Treatment 1 (relative to the other treatment effects) in the regression considering as outcome positive attitudes towards violence, even if no statistical significance is achieved. We observe a significant negative effect of Treatment 3 on the likelihood of witnessing verbal violence: this is a 5 percentage-point effect. This is statistically distinct from the effect of Treatment 2. Finally, on outcomes related to the trust game, we find no statistically significant effects on average amounts sent or on the desire to punish.

In summary, we find some evidence that the full treatment (Treatment 3) increased membership of local organizations, awareness and participation/contribution in the matching grants activity, participation in meetings, and the likelihood of voting being employed in decision-making at the meetings. Information to the community (Treatment 2) increased awareness and participation in the matching grants activity and participation in the meetings. We also observe clear effects of Treatments 2 and/or 3 on increasing trust at different levels, voice/accountability at different levels, and decreasing the likelihood of violence.

7. Discussion

We find evidence that a community-targeted information campaign in Northern Mozambique, relating to the recent discovery of natural gas in the region, was effective in raising awareness and knowledge of the topic by citizens (some effects were found for leaders as well). When information is given to local leaders only, we observe an increase in elite capture as well as in rent-seeking by leaders and citizens. Most of these effects do not seem to emerge when information is given to citizens. Moreover, we document increases in citizen mobilization, trust, voice, the demand for political accountability, and a decrease in violence, when information is targeted at the general population. This pattern of results is consistent with a known mechanism of the resource curse that is centred on misgovernance by politicians. It is also consistent with a positive role of information in countering the curse.

8. Specific findings for policy and practice

Our study provides important recommendations for different stakeholders, such as policy-makers, implementers and transparency and accountability researchers.

Firstly, our study is relevant for policy-makers for two main reasons. We show that a large-scale information campaign can be effective in raising levels of awareness in the population about a resource discovery and its related management debates. Second, we report clear effects on trust in government at different levels, as well as on decreasing violence. These findings are of crucial importance in face of the known association of the resource curse with localized conflict in resource-producing areas. The appropriate management of expectations of the local population and the implementation of inclusive deliberation processes as resource exploration unfolds may be key to escape the emergence of localized conflict. Information campaigns like the one we study in this study can be seen as a central piece of those efforts.

Secondly, this report provides important practical insights for implementers interested in raising awareness of not only discoveries of new reserves of natural resources, but also on more general events in which the public opinion might have an interest in. We show that it is important that these campaigns are targeted at citizens, rather than local leaders. In addition, we show that campaigns designed in a way to attract the attention and the understanding of the audiences can be indeed functional in raising awareness. While it is not the objective of the study to provide evidence on different designs for information campaigns, we show that complementing leaflets with community theatres have large effects in terms of awareness.

Thirdly, our study provides new fundamental findings on the interaction of citizens and local leaders in a natural resource boom setting, but before any revenue windfalls has ever happened. This is a unique opportunity to learn about the natural resource curse, when only information is disseminated. New research can build from our study to learn about potential long-run interactions between information heterogeneity and community behaviour once extraction start and revenue windfalls are distributed.

Table 2 – Leaders’ awareness and knowledge of the natural gas discovery

Dep. Var.:	Awareness		Knowledge		Salience		Knowledge (self-reported)	Perceived benefit to Community	Perceived benefit to Household	
	Sample:	All (1)	All (2)	All (3)	All (4)	All (5)	All (6)	Respondents (7)	aw are of the discovery (8)	(9)
(T1) Information to Leader		0.042** (0.020)	0.042** (0.020)	0.039** (0.018)	0.042** (0.017)	0.072 (0.088)	0.085 (0.089)	0.134 (0.125)	0.036 (0.065)	0.031 (0.081)
(T2) Information to Leader and Citizens		0.050** (0.021)	0.050** (0.021)	0.062*** (0.018)	0.061*** (0.018)	0.317*** (0.092)	0.317*** (0.093)	0.068 (0.131)	0.009 (0.068)	-0.025 (0.085)
(T3) Information plus Deliberation		0.056*** (0.021)	0.060*** (0.021)	0.048** (0.019)	0.051*** (0.018)	0.335*** (0.092)	0.348*** (0.094)	0.168 (0.131)	-0.034 (0.068)	-0.063 (0.085)
Observations		206	203	206	203	206	203	204	204	204
R-squared		0.143	0.175	0.231	0.288	0.336	0.340	0.527	0.199	0.129
Mean (control group)		0.964	0.964	0.629	0.629	0.291	0.291	2.585	0.868	0.830
T1 = T2 (p-value)		0.703	0.704	0.214	0.296	0.009	0.014	0.608	0.684	0.505
T1 = T3 (p-value)		0.500	0.381	0.633	0.633	0.005	0.006	0.797	0.298	0.271
T2 = T3 (p-value)		0.762	0.615	0.448	0.580	0.843	0.743	0.439	0.515	0.652
Lagged Dependent Variable		No	Yes	No	Yes	No	Yes	No	No	No

Note: estimates based on OLS regression (see equations 1 and 2). *** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in parenthesis and clustered at community level. Columns (1), (3), (5) and (7)-(9) present estimates using equation (1). Columns (2), (4), (6) present estimates using equation (2), including the lagged value of the dependent variable. Depending on the column, the dependent variables are defined by the following: (1)-(2) Awareness: indicator variable equal to 1 if the respondent reports having heard about the natural gas discovery; (3)-(4) Knowledge: index built averaging 12 indicator variables concerning knowledge of whether the government is receiving revenues from natural gas extraction, about the firms involved, and about the location of the discovery; (5)-(6) Salience: indicator variable equal to 1 whether the respondent use the word 'gas' when asked about the three major events in the district in the last 5 years; (7) Knowledge (self-reported): self-reported level of information about the natural gas discovery (1 = not at all - 4 = fully informed); (8) Perceived benefit to Community: indicator variable equal to 1 if the respondent agree or fully agree that the community will benefit from natural gas; (9) Perceived benefit to Household: indicator variable equal to 1 if the respondent agree or fully agree that his household will benefit from natural gas. In columns (4)-(6), the sample is restricted to respondents aware of the natural gas discovery. All specifications include village- and leader-level controls.

Table 3 – Citizens’ awareness and knowledge of the natural gas discovery

Dep. Var.:	Awareness		Knowledge		Salience		Knowledge	Perceived benefit to	
	Sample:	All	All	All	All	All	(self-reported) Respondents	Community	Household
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	aware of the discovery	(9)
(T1) Information to Leader	0.013 (0.028)	0.016 (0.030)	0.011 (0.018)	0.013 (0.019)	0.057** (0.026)	0.074** (0.030)	0.125** (0.053)	-0.000 (0.029)	0.028 (0.029)
(T2) Information to Leader and Citizens	0.251*** (0.027)	0.250*** (0.028)	0.172*** (0.017)	0.170*** (0.018)	0.219*** (0.026)	0.219*** (0.028)	0.238*** (0.046)	0.045* (0.023)	0.069** (0.027)
(T3) Information plus Deliberation	0.241*** (0.026)	0.238*** (0.026)	0.169*** (0.017)	0.163*** (0.017)	0.233*** (0.030)	0.243*** (0.032)	0.276*** (0.044)	0.044** (0.020)	0.069*** (0.025)
Observations	2067	1875	2067	1875	2072	1879	1622	1589	1570
R-squared	0.270	0.283	0.384	0.406	0.174	0.173	0.117	0.149	0.123
Mean (control group)	0.681	0.671	0.462	0.453	0.189	0.182	1.974	0.779	0.692
T1 = T2 (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.100	0.162
T1 = T3 (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.114	0.153
T2 = T3 (p-value)	0.692	0.635	0.862	0.677	0.610	0.437	0.347	0.969	0.988
Lagged Dependent Variable	No	Yes	No	Yes	No	Yes	No	No	No

Note: estimates based on OLS regression (see equations 1 and 2). *** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in parenthesis and clustered at community level. Columns (1), (3), (5) and (7)-(9) present estimates using equation (1). Columns (2), (4), (6) present estimates using equation (2), including the lagged value of the dependent variable. Depending on the column, the dependent variables are defined by the following: (1)-(2) Awareness: indicator variable equal to 1 if the respondent reports having heard about the natural gas discovery; (3)-(4) Knowledge: index built averaging 12 indicator variables concerning knowledge of whether the government is receiving revenues from natural gas extraction, about the firms involved, and about the location of the discovery; (5)-(6) Salience: indicator variable equal to 1 whether the respondent use the word ‘gas’ when asked about the three major events in the district in the last 5 years; (7) Knowledge (self-reported): self-reported level of information about the natural gas discovery (1 = not at all - 4 = fully informed); (8) Perceived benefit to Community: indicator variable equal to 1 if the respondent agree or fully agree that the community will benefit from natural gas; (9) Perceived benefit to Household: indicator variable equal to 1 if the respondent agree or fully agree that his household will benefit from natural gas. In columns (4)-(6), the sample is restricted to respondents aware of the natural gas discovery. All specifications include village- and household-level controls.

Table 4 – Elite capture

Dep.Var.	Attitudes against Corruption		Zinc Roof Usage	Funds for Meetings		Taskforce Activity			Trust Game	
				Spent all budget	Expenses	Average Raven's Score	Top performers selected	Mid-performers selected	Women Selected	Leader Returns
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(T1) Information to Leader	-0.106*** (0.040)	-0.101** (0.041)	0.030 (0.083)	-0.332*** (0.095)	-60.165*** (22.645)	0.321 (0.319)	-0.206*** (0.077)	0.219** (0.096)	-0.079* (0.040)	-0.433 (0.560)
(T2) Information to Leader and Citizens	-0.050 (0.042)	-0.063 (0.044)	0.071 (0.086)	-0.140 (0.099)	-4.953 (23.715)	0.334 (0.333)	-0.136* (0.080)	0.135 (0.100)	-0.016 (0.042)	-0.315 (0.593)
(T3) Information plus Deliberation	-0.076* (0.042)	-0.082* (0.044)	0.106 (0.086)	-0.154 (0.099)	-5.769 (23.696)	0.264 (0.333)	-0.094 (0.081)	0.124 (0.100)	0.043 (0.042)	-0.753 (0.592)
Observations	204	192	206	205	205	206	206	206	206	203
R-squared	0.201	0.205	0.306	0.190	0.267	0.181	0.242	0.196	0.277	0.178
Mean (control group)	0.927	0.927	-0.200	0.509	313.000	3.516	0.291	0.491	0.218	5.927
T1 = T2 (p-value)	0.180	0.390	0.628	0.054	0.021	0.971	0.385	0.403	0.134	0.842
T1 = T3 (p-value)	0.479	0.660	0.382	0.078	0.025	0.865	0.171	0.349	0.005	0.592
T2 = T3 (p-value)	0.544	0.689	0.687	0.885	0.973	0.835	0.602	0.909	0.168	0.462
Lagged Dependent Variable	No	Yes	No	No	No	No	No	No	No	No

Note: estimates based on OLS regression (see equations 1 and 2). *** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in parenthesis and clustered at community level. Columns (1), (3)-(10) present estimates using equation (1). Column (2) presents estimates using equation (2), including the lagged value of the dependent variable. Depending on the column, the dependent variables are defined by the following: (1)-(2) Attitudes against Corruption: average between an indicator variable equal to 1 if the leader disagree with the statement “the best way to overcome problems is to pay bribes” and an indicator variable equal to 1 if the leader would not demand a job for himself when asked “Imagine that you had the opportunity to have a meeting with the Governor of Cabo Delgado and that you could make a request. Please tell me what you would ask”; (3) Zinc Roof Usage: index for community use of zinc roof tiles; (-1) leader’s personal use, (0) unused, (1) community use. For Funds for Meetings, (4) Spent all budget: indicator for whether leader used all (> 350 of 400 Meticais) funds for meeting; (5) Expenses: expenses during the meeting (in Meticais). For the Taskforce Activity, (6) Average score on Raven’s test of individuals chosen by leader; (7) Top performers selected: indicator variable for 1st quintile in the sample distribution of difference between average test score of persons chosen by leader and individuals’ scores; (8) Mid-performers selected: indicator variable for 2nd-4th quintiles in the sample distribution of difference between average test score of persons chosen by leader and individuals’ scores; (9) Women Selected: percent of women chosen by leader for the Raven’s test. For the Trust Game, (10) Leader Returns: amount Leader Returned (out of 15 tokens) in Trust Game. All specifications include village- and leader-level controls.

Table 5 – Rent-seeking among local leaders

Dep. Var.	Relationship with Influential People						Auction	Rent-seeking Game
	Knows any person		Called		Number of calls		Bid for Meeting	Degree of RS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(T1) Information to Leader	-0.037 (0.059)	-0.035 (0.062)	-0.047 (0.077)	-0.002 (0.079)	-0.648* (0.364)	-0.577 (0.364)	0.103 (0.119)	0.031 (0.062)
(T2) Information to Leader and Citizens	-0.038 (0.062)	-0.038 (0.063)	-0.006 (0.081)	0.019 (0.081)	-0.542 (0.380)	-0.504 (0.382)	0.100 (0.125)	-0.011 (0.067)
(T3) Information plus Deliberation	-0.053 (0.062)	-0.045 (0.064)	-0.034 (0.081)	-0.014 (0.081)	-0.368 (0.380)	-0.354 (0.383)	-0.012 (0.125)	0.032 (0.066)
Observations	204	198	206	203	206	203	206	201
R-squared	0.206	0.217	0.275	0.299	0.221	0.240	0.238	0.115
Mean (control group)	0.926	0.926	0.800	0.800	3.189	3.189	4.217	0.179
T1 = T2 (p-value)	0.986	0.969	0.617	0.795	0.779	0.848	0.976	0.528
T1 = T3 (p-value)	0.787	0.877	0.883	0.888	0.468	0.565	0.361	0.986
T2 = T3 (p-value)	0.797	0.908	0.727	0.690	0.648	0.699	0.371	0.522
Lagged Dependent Variable	No	Yes	No	Yes	No	Yes	No	No

Note: estimates based on OLS regression. *** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in parenthesis and clustered at community level. Columns (1), (3), (5), (7) and (8) present estimates using equation (1). Columns (2), (4) and (6) present estimates using equation (2), including the lagged value of the dependent variable. Depending on the column, the dependent variables are defined by the following: for the Relationship with Influential People, (1)-(2) Knows any person: indicator variable equal to 1 if the citizen knows influential people; (3)-(4) Called: indicator variable equal to 1 if the citizen called influential people; (5)-(6) Number of calls: number of calls (in logs) to influential people in the last 6 months. For the Auction activity, (7) Bid for Meeting: log amount bid for the meeting with administrator. For the Rent-seeking Game, (8) Degree of Rent-seeking: amount of rent-seeking as proportion of total possible: Varies continuously from 0 (low est rent-seeking), to 1 (full rent-seeking).

Table 6 – Rent-seeking among citizens

Dep. Var.	Relationship with Influential People						Meeting – Training Auction		Rent-seeking Game	
	Knows any person		Called		Number of calls		Bid Difference	Share Bid to Meeting	Gifts Sent	Any Gift Sent
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(T1) Information to Leader	0.061** (0.030)	0.062** (0.031)	0.037** (0.017)	0.028* (0.017)	0.134** (0.058)	0.115** (0.058)	0.153** (0.076)	0.028** (0.013)	0.151 (0.216)	0.039 (0.025)
(T2) Information to Leader and Citizens	-0.015 (0.032)	-0.015 (0.032)	0.016 (0.015)	0.013 (0.015)	0.066 (0.048)	0.066 (0.050)	0.061 (0.066)	0.006 (0.011)	0.346* (0.209)	0.049* (0.025)
(T3) Information plus Deliberation	0.047* (0.027)	0.042 (0.028)	0.043** (0.018)	0.045** (0.019)	0.063 (0.052)	0.072 (0.054)	0.082 (0.072)	0.007 (0.013)	0.056 (0.216)	0.033 (0.027)
Observations	2065	1861	2072	1879	2072	1879	2072	2072	2023	2023
R-squared	0.107	0.117	0.064	0.076	0.062	0.073	0.020	0.023	0.117	0.043
Mean (control group)	0.614	0.610	0.064	0.063	0.181	0.176	-0.029	0.499	4.079	0.880
T1 = T2 (p-value)	0.026	0.026	0.271	0.418	0.277	0.428	0.130	0.028	0.300	0.597
T1 = T3 (p-value)	0.673	0.539	0.729	0.391	0.268	0.511	0.289	0.057	0.624	0.778
T2 = T3 (p-value)	0.061	0.090	0.120	0.081	0.962	0.906	0.736	0.891	0.138	0.465
Lagged Dependent Variable	No	Yes	No	Yes	No	Yes	No	No	No	No

Note: estimates based on OLS regression (see equations 1 and 2). *** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in parenthesis and clustered at community level. Columns (1), (3), (5) and (7)-(10) present estimates using equation (1). Columns (2), (4) and (6) present estimates using equation (2), including the lagged value of the dependent variable. Depending on the column, the dependent variables are defined by the following: for the Relationship with Influential People, (1)-(2) Knows any person: indicator variable equal to 1 if the citizen knows influential people; (3)-(4) Called: indicator variable equal to 1 if the citizen called influential people; (5)-(6) Number of calls: number of calls (in logs) to influential people in the last 6 months. For the Meeting – Training Auction activity, (7) Bid Difference: difference between the log amount bid for the meeting with administrator and the log amount bid for the local training; (8) Share Bid for Meeting: share of total bids allocated to meeting the administrator. For the Rent-seeking Game, (9) Gifts Sent: number of gift tokens (out of 10) sent to leader; (10) Any Gift Sent: indicator variable for whether the participant sent any tokens as gift to leader. All specifications include village- and household-level controls.

Table 7 – Citizen’s mobilization

Dep. Var.	Group Membership		Community Meetings Participation		Matching Grant Activity				Public Good Game	
					Awareness	Contributed	Amount Contributed	Attendance	Voting	Contribution
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(T1) Information to Leader	-0.008 (0.022)	-0.032 (0.024)	0.005 (0.019)	0.002 (0.020)	0.019 (0.035)	0.043 (0.046)	0.140 (0.177)	0.024 (0.015)	-0.028 (0.031)	-0.136 (0.186)
(T2) Information to Leader and Citizens	0.022 (0.022)	0.003 (0.025)	0.033* (0.018)	0.034* (0.019)	0.094*** (0.035)	0.090* (0.051)	0.259 (0.192)	-0.003 (0.016)	-0.022 (0.032)	-0.134 (0.208)
(T3) Information plus Deliberation	0.067** (0.027)	0.052* (0.030)	0.041** (0.017)	0.041** (0.018)	0.109*** (0.033)	0.108** (0.049)	0.388* (0.197)	0.032** (0.016)	0.061* (0.032)	0.028 (0.206)
Observations	2051	1776	2014	1792	2067	2072	2008	203	206	2023
R-squared	0.106	0.129	0.073	0.089	0.102	0.091	0.085	0.227	0.156	0.071
Mean (control group)	0.232	0.225	0.899	0.892	0.704	0.340	1.217	0.044	0.018	4.479
T1 = T2 (p-value)	0.210	0.149	0.113	0.084	0.027	0.372	0.544	0.083	0.836	0.989
T1 = T3 (p-value)	0.006	0.003	0.059	0.051	0.006	0.217	0.237	0.650	0.007	0.335
T2 = T3 (p-value)	0.107	0.099	0.679	0.687	0.653	0.761	0.568	0.028	0.011	0.381
Lagged Dependent Variable	No	Yes	No	Yes	No	No	No	No	No	No

Note: estimates based on OLS regression. *** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in parenthesis and clustered at community level. Columns (1), (3), (5)-(11) present estimates using equation (1). Columns (2) and (4) present estimates using equation (2), including the lagged value of the dependent variable. Depending on the column, the dependent variables are defined by the following: (1)-(2) Group Membership: indicator variable equal to 1 if the citizen is an active member or leader in a professional or local organization or in a local committee; (3)-(4) Community Meetings Participation: indicator variable equal to 1 if the citizen participated in at least one community meeting in the last 12 months. For Matching Grants Activity: (5) Awareness: indicator variable equal to 1 if the citizen heard about the activity; (6) Contributed: indicator variable equal to 1 if the citizen reported contributing a positive amount; (7) Amount Contributed: log of self-reported contribution in matching activity; (8) Attendance: (observed) share of adults in the community who attended the matching activity; (9) Voting: indicator variable equal to 1 if the decision in the matching activity was determined by voting. For Public Goods Game: (10) Contribution: contribution (out of 10 tokens) in public goods game. Specifications in columns (1)-(7) and (10) include village- and household-level controls. Specifications in columns (8)-(9) include village- and leader-level controls.

Table 8 – Trust and Accountability

Dep. Var.	Trust (self-reported)			Voice at		Violence		Trust Game			
	Average Trust	Community Leaders known	Provincial Government	National Leaders	Provincial level	National level	Attitudes towards	Verbal violence	Amount sent	Desire to punish	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(T1) Information to Leader	-0.023*	-0.025**	0.005	-0.058	0.020	-0.033	0.018	0.034	0.001	0.144	0.043
	(0.012)	(0.012)	(0.035)	(0.039)	(0.039)	(0.046)	(0.046)	(0.031)	(0.029)	(0.169)	(0.037)
(T2) Information to Leader and Citizens	0.023**	0.025**	0.057*	0.056	0.056	0.086*	0.111***	-0.008	-0.003	0.020	0.046
	(0.011)	(0.011)	(0.032)	(0.037)	(0.038)	(0.049)	(0.042)	(0.027)	(0.026)	(0.171)	(0.039)
(T3) Information plus Deliberation	-0.006	-0.004	0.057**	-0.016	0.059*	0.052	0.053	0.005	-0.045*	0.125	-0.020
	(0.012)	(0.011)	(0.023)	(0.042)	(0.035)	(0.049)	(0.046)	(0.032)	(0.026)	(0.182)	(0.038)
Observations	2030	1744	1627	2058	2065	1998	2001	1881	2065	2023	2003
R-squared	0.104	0.133	0.128	0.080	0.085	0.062	0.067	0.056	0.049	0.149	0.047
Mean (control group)	0.767	0.769	2.828	2.440	2.446	2.500	2.488	0.298	0.349	4.053	0.398
T1 = T2 (p-value)	0.000	0.000	0.225	0.003	0.347	0.028	0.060	0.123	0.893	0.499	0.927
T1 = T3 (p-value)	0.165	0.084	0.115	0.358	0.297	0.099	0.471	0.354	0.111	0.928	0.111
T2 = T3 (p-value)	0.017	0.017	0.978	0.087	0.945	0.542	0.216	0.641	0.089	0.581	0.119
Lagged Dependent Variable	No	Yes	No	No	No	No	No	No	No	No	No

Note: estimates based on OLS regression (see equations 1 and 2). *** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in parenthesis and clustered at community level. Depending on the column, the dependent variables are defined by the following: for Trust outcomes, (1)-(2) Average Trust: average of all self-reported measures of trust (family, neighbours, local leaders, local people, district government, province government, Mozambicans, and national leaders) (0 = no trust / 1 = highest trust); (3) Community Leaders Known: self-reported trust for community leaders that are personally known by the respondent (1 = not at all / 4 = trust a lot); (4) Provincial government: self-reported trust for provincial government (1 = not at all / 4 = trust a lot); (5) National Leaders: self-reported trust for national leaders (1 = not at all / 4 = trust a lot). For Voice at, (6) Provincial level: self-reported level in which citizens have voice with provincial administrators (1 = not at all / 4 = totally); (7) National level: self-reported level in which citizens have voice with national administrators (1 = not at all / 4 = totally). For Violence, (8) Attitudes towards violence: indicator variable equal to 1 if the citizen believes violence is justified to defend a cause; (9) Verbal violence: indicator variable equal to 1 if the respondent witnessed any verbal violence in the last 3 months. For the Trust Game, (10) Amount sent: amount sent (out of 10 tokens) by the participant in the trust game; (11) Desire to punish: indicator variable equal to 1 if the respondent has desire to punish selfish leader in the trust game. Specifications in columns (1)-(9) include village- and household-level controls. Specifications in columns (10)-(11) include village- and leader-level controls.

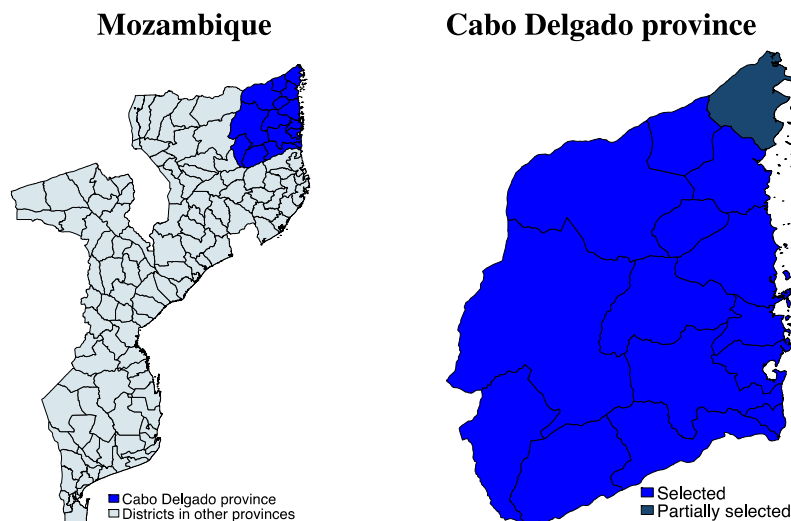
Appendix. Sample design

Villages were selected from all districts except one in the province of Cabo Delgado. The sampling frame was the electoral one, which yields data on registered voters per polling station. There are 474 polling stations in the province, as of the last national election in 2014. Since one of the objectives of the study is to understand the relationship between natural resources and political outcomes and we cannot observe voting outcomes at village level, we selected polling stations as our geographical unit of interest.

The selection process excluded islands (2 polling stations, and all 4 polling stations of the excluded Ibo district), as well as polling stations in Palma administrative seat (11 polling stations). The former stations were excluded due to their unrepresentative isolation. The latter stations were instead excluded to avoid communities that will be relocated due to the construction of a LNG plant. Figure 11 presents the geographical distribution of the selected areas, both for the whole country and within the Cabo Delgado district. Further exclusions involve polling stations that moved from 2009 to 2014 electoral frames (54 polling stations) and polling stations that were smaller than or equal to the 5th percentile by number of registered voters (corresponding to approximately 200 voters per polling station). The former polling stations were excluded to focus on more stable polling stations and that can therefore be compared over time, while the latter were excluded due to non-representativeness and anticipation of difficulties in household recruitment.

For the random sampling among remaining polling stations, polling stations were stratified into three groups: polling stations in urban areas (Pemba and Montepuez), polling stations in semi-urban areas (administrative seats of each district), and finally all other stations. In this sampling frame, there are 421 polling stations: 14 in urban areas and 39 in semi-urban areas.

Figure 6 – Selected districts within Mozambique and within Cabo Delgado



Note: in dark blue, the provinces selected for the project. Credit: author's calculations, administrative divisions provided by www.gadm.org.

We selected a total number of 200 polling stations at random using the following rules for selection within each stratum. In urban strata, we selected 8 polling stations in Pemba and 4 polling stations in Montepuez. In semi-urban strata, we selected 2 polling stations per town, except when only 1 was available (in which case only one was selected). The remaining 165 stations are sampled from all other polling stations. Additionally, 7 polling stations were added to the sample (following the same sampling rules as before). These additional areas are to be use as a safeguard in case any of the 200 villages have to be excluded over the duration of the study. Hence, the baseline was conducted in a total of 207 polling stations. Table 9 shows the list of strata and the number of available and sampled polling stations for the 200 polling stations.

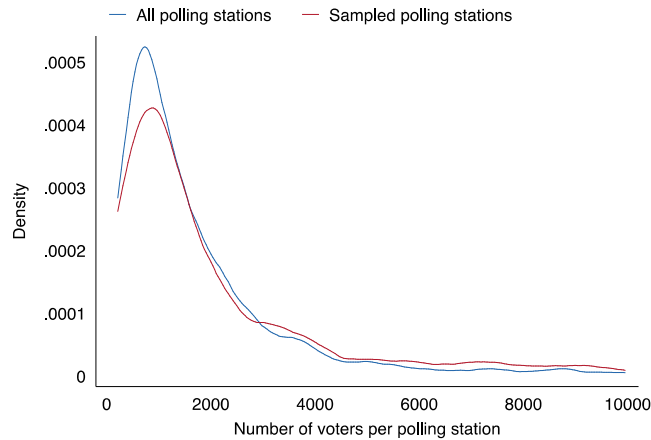
Table 9 – Distribution of available and sampled polling stations by strata

Stratum	Name	Polling Stations		
		Available	Sampled	% Sampled
URBAN	Pemba	9	8	0.040
URBAN	Montepuez	5	4	0.020
SEMI-URBAN	Ancuabe	5	2	0.010
SEMI-URBAN	Balama	1	1	0.005
SEMI-URBAN	Chiure	1	1	0.005
SEMI-URBAN	Mocimboa da Praia	4	2	0.010
SEMI-URBAN	Macomia	8	2	0.010
SEMI-URBAN	Mecufe	3	2	0.010
SEMI-URBAN	Meluco	3	2	0.010
SEMI-URBAN	Metuge	2	2	0.010
SEMI-URBAN	Mueda	4	2	0.010
SEMI-URBAN	Muidumbe	2	2	0.010
SEMI-URBAN	Namuno	3	2	0.010
SEMI-URBAN	Nangade	1	1	0.005
SEMI-URBAN	Palma	1	1	0.005
SEMI-URBAN	Quissanga	1	1	0.005
OTHER STATIONS	-	421	165	0.825
TOTAL	-	474	200	1.000

The sampling design presents an oversampling of urban and semi-urban polling station in order to have a more representative sample of the few urban settlements in the province. Figure 12 shows a comparison of the distribution of registered voters in the sampling frame and the sampled polling stations. Each distribution is estimated using a non-parametric kernel density of the number of voters per polling station. The blue line presents the distribution of the number of registered voters per polling station in the sampling frame, while the red line presents the same distribution in the sampled polling stations.

The distribution of registered voters in sampled polling stations is more representative of larger polling stations compared to the sampling frame, due to the oversampling. For larger polling stations, the distribution is comparable between sampled stations and its population.

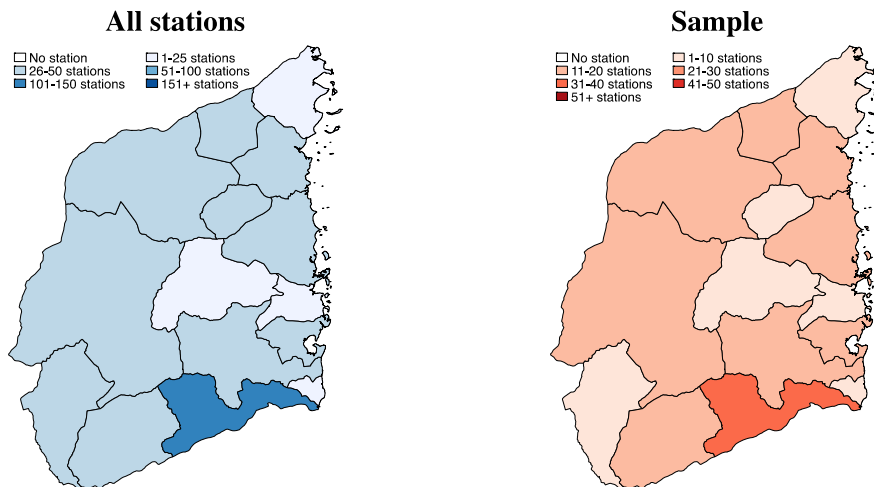
Figure 7 – Distribution of voters in sampled polling stations and all stations



Note: The blue line presents the distribution of the number of registered voters per polling station in the sampling frame, while the red line presents the same distribution in the sampled polling stations. Credit: author's calculations.

In order to obtain a geographical representation of sampled polling stations, we present the distribution among different districts of the number of polling stations and the number of sampled polling stations. Figure 13 presents the geographical distribution of polling stations in both the population and the sample. The left panel presents the geographic distribution of the number of polling station, while the right panel shows the same information but restricted to sampled polling stations. We can observe that stratified random sampling tend to replicate the distribution of polling stations in the sampling frame. While the number of polling stations is comparable across districts, the number of stations is slightly higher in Chiure district, in the southern part of Cabo Delgado. Overall, the sample is covering the whole province.

Figure 8 – Geographic distribution of polling stations



Note: left panel presents the geographic distribution of the number of polling station, while the right panel shows the same information but restricted to sampled polling stations. Metuge is included in Pemba district and Ibo is included in Quissanga district. Credit: author's calculations, administrative divisions provided by www.gadm.org.

Appendix. Survey instruments

The survey instruments used during the baseline data collection are composed by three questionnaires: *Household*, *Leader*, and *Community* questionnaires. In this section, we describe the main characteristics of these instruments.

Household

The household questionnaire was designed for the purpose of collecting data from ten citizens of each village. The questionnaire is composed of several modules:

- *Identification and Selection* – This section includes the identification and location of the house and of the respondent, and questions that identify if the individual meets the requirements to take part in the project.
- *Demographics* – This section contains detailed questions on the demographic characteristics of the respondent and the household, including gender, age, marital status, number of household members, education, languages spoken, occupation, income, and expenditures.
- *Agriculture* – This section presents questions on the total land owned by the household, amount of land used for agriculture, and the assets of the household.
- *Household characteristics* – Information about the materials used to build the house and basic conditions as water and electricity.
- *Information about natural resources* – Includes questions about sources and frequency of information about political issues and knowledge of natural gas. Elicits opinions about the benefits of the natural gas, and questions to examine existing knowledge about natural gas.
- *Discount and risk* – This section measures time and risk preferences of respondents.
- *Aspirations* – Includes questions about the current situation of the province, the country, and the household's economic situation, as well as future expectations and desires. Furthermore, questions about expected and desired occupation, as well as, expected and desired children's education, and level of inclusion in village activities. The section ends with questions related to the expected future investment of the government in the village.
- *Trust* – Collects information about the level of trust individuals have in their family, neighbours, local leaders, members of the community or tribe, members from other communities or tribes, leaders of the district and of the province, and national leaders.
- *Social capital* – This section asks about level of participation in social groups, community meetings, rallies, and political campaigns, and about his/her household's contribution to community improvements, as well as detailed information about any influential people the respondent knows. We also ask the respondent extensive information about its relationship with all leaders in the village, including influential people, high-level officials, community and religious leaders.

- *Political accountability* – Includes questions on political accountability, such as how decisions are made in the community, the involvement of the respondent in the community, agreement with statements about politics, and knowledge about local leaders. The section ends with questions about violence in the community.
- *Political preferences and rent-seeking* – This final section includes information on which political parties the respondent supports, and attitudes towards rent-seeking behaviour.

Leader

In line with the household survey, a survey was addressed to the leader of each village. To maintain consistency, a person is considered a leader when selected by the community through a community meeting and subsequently approved by the district government. A leader's main role is to act as a liaison between the government and the community. Religious leaders or other influential villagers were not part of the study. While we focus on a specific leader for this measurement instrument, in the household questionnaire, we collect extensive information about the relationship between the household head and all leaders.

The survey is similar to the previous one but includes additional questions related to the position of the respondent as a leader, such as, how long he/she is in the office, role in social groups, and questions relating to decision-making.

Community

The community survey was collected from up to 7 community members from each village who answered the questionnaire together (typically those who are influential in the community and/or are members of community groups). It includes a comprehensive set of questions about village characteristics. It comprises the following sections:

- *Identification of the village* - Basic information about the identity of the village, respondents, number of households, number of households working in natural resources, migration, and ethnic/linguistic composition.
- *Infrastructure* – This section is dedicated to the infrastructure available in the village.
- *Natural resources* – Includes information about any natural resources that may exist in the village surroundings.
- *Markets* – This section asks details about markets that villagers attend.
- *Improvements* – This module includes questions on any improvements made to the community during the last 12 months.
- *Social groups* – Information about the existence and characteristics of any social groups in the village.
- *Community meetings* – This section contains questions about frequency, attendance, and content of meetings in the village.
- *Social capital* – This section includes the identification of leaders and influential individuals in the community.

Appendix. Pre-analysis plan

This pre-analysis plan describes the methodology that will be used to evaluate the impact of an intervention that aims to promote transparency and accountability in the management of natural gas revenues in Mozambique¹⁶. This intervention will occur during the second half of 2016 in the province of Cabo Delgado.

Mozambique discovered substantial natural resources in recent years. Known gas reserves in the Rovuma basin have the potential to transform Mozambique into a global player in Liquefied Natural Gas exports. Being a recent democracy, and with relatively weak institutions, Mozambique also faces considerable risks of resource and revenue mismanagement in the future, particularly since media independence and penetration are low and the level of political accountability is not improving.

The intervention we will evaluate consists on the distribution of information about the management of the newly discovered natural gas in the Rovuma basin, and the holding of citizen meetings to deliberate on the main priorities for spending the revenues from these resources. These activities will be sponsored and implemented by a consortium of NGOs led by free-distribution newspaper @Verdade. These implementing agencies strongly believe that the resource curse can be counteracted through the widespread provision of information about the management of natural resources in the country. Behind this belief is the hypothesis that information will make politicians accountable through the electoral system.

We propose to evaluate three different treatments at the level of the community. The first is the dissemination of information about natural resources and its management to the local elite only (group 1). The second is the dissemination of information about natural resources and its management to both the population through community meetings and door-to-door contact, and to the local elite (group 2). Within this treatment, we will evaluate different types of information leading subjects to potentially different aspirations: control and information on success cases for well-governed resource booms (aspirations module). The third is deliberation in small citizen committees about priorities for the spending of natural resource revenues, in addition to information to citizens and elite (group 3). Within this treatment, we will evaluate different methods of deliberation at the citizen group level: default, majority elections (secret), and open deliberation (deliberation module).

Randomization procedure and Sample

Randomization design and sample

The study main research questions are the following:

1. What is the effect of information about natural resources on the political elite's behaviour, when local elites are the only ones being informed, when everyone is informed, and when citizens deliberate on ways to spend resource revenues?

¹⁶ In the event that the structure of the data or other unforeseen factors necessitate adjustments in the methodology and specifications to be employed in the analysis, such adjustments will be documented with reference to the original specifications in this note and accompanied by a justification of why such adjustments were necessary.

2. What is the effect of information about natural resources on citizens' behaviour, when everyone is informed and when citizens deliberate on ways to spend resource revenues?
3. What is the impact of different types of information channelled to citizens, namely on aspirations and other citizen outcomes?
4. What is the impact of different types of deliberation, i.e., default, majority elections (secret), and open deliberation, on elite behaviour/deliberation outcomes?
5. How are the above-referred impacts different for subjects living closer to the centre of action for the natural gas boom?

In order to answer these research questions, we will implement a randomized controlled trial in partnership with the implementing agency, @Verdade. Randomization will be conducted at the community level. A community will be identified as a polling station. This will allow us to use actual political behaviour as an outcome variable.

We will select 200 communities (including villages and urban neighbourhoods) in Cabo Delgado province. These will be selected randomly from the communities identified by the corresponding polling locations of that province. We will structure the 200 communities in clusters of four communities matched on geographical traits including proximity and randomly allocate each to one of the groups, described in Section 1:

- Group 0. Control Group
- Group 1. Information to the elite
- Group 2. Information to the elite + Information to the community
- Group 3. Information to the elite + Information to the community + Deliberation

In terms of measurement within the 200 communities, we will select subjects randomly from the pool of subjects accepting to participate in our games: within each community, 20 individuals will be selected for participation in the dictator and trust games, and 10 individuals will be selected for participation in the public game. We will place door-to-door invitations for the purpose of participation in the lab games. Surveys will be submitted to 10 random adults in each community, by stratifying on households (one adult per household), and following standard door-to-door sampling procedures.

In Group 2, we will also have the aspirations module. For this group, citizens will be randomly assigned to two groups, one providing information about success cases in the management of natural resources, the other assigned to control.

Within each of the communities in Group 3, we will randomly allocate citizens to the three deliberation treatments: secret voting, open deliberation, and default. Initially, @Verdade implementers will collect a list of citizens interested in deliberating about the priorities for resource revenue spending. When all participating subjects are identified, they will be assigned randomly to three groups. When they are formed, sealed envelopes with the type of deliberation (fieldworkers will not know the specific contents) will be given to the three groups. This procedure guarantees random assignment of treatments to deliberation citizen groups.

Unit of Analysis

Depending on the outcome of interest, the unit of analysis is at the individual level, at the household level, or at the community level. For behavioural data sources, we will distinguish individual data between elite and citizens. We indicate as “local elites” the village leaders. In Mozambique, these individuals are well-defined figures in each community. At the level of the community ("*localidade*"), a local chief is the person in charge for the community. At a smaller level, there are chiefs for villages (*chefes de aldeia*) or neighbourhoods (*secretários de bairro*), and for blocks (*chefes de quarteirão* or *chefes de bloco*). They are typically elected by the community (informally) even though the ruling party can strongly influence the outcome, through higher levels of the government structure (at the level of the *localidade* or *posto administrativo* – note that the chiefs at these levels are nominated by the provincial governor). In addition to these figures, the "*régulos*" are the traditional village leaders. These leaders follow a hereditary system, passing from parents to sons. The competencies at the lower levels (village, neighbourhood, block) are mainly related to conflict resolution, land allocation, and formal ceremonies. These leaders also influence the allocation of aid and employment programs.

Attrition

In order to minimize attrition, we will collect cell phone numbers of respondents and other members of the household, from the participants in the games and in the modules activities. Additionally, we will collect social network data and GPS coordinates.

Data sources

We plan to collect data from several sources:

- i. Survey data – this will consist on a baseline conducted in 2016 and an end-line in 2017;
- ii. Structured Community Activities –to be designed and tested during the first phase of project. Different SCAs will be conducted to measure elite and citizens behaviour;
- iii. Lab Games – dictator game played with the elite, and a trust game and a public good game with the citizens;
- iv. Official electoral data – aggregated at the poll level, from the municipal elections in 2018 and the national general elections in 2019;
- v. Qualitative data – to be collected at the pilot stage, during the intervention (particular focus on the deliberation groups) and at end line.

Hypotheses

With this impact evaluation, we will be able to test the following hypothesis:

B. Information

1. Information on natural resources will affect elite's provision of public goods and investment in political connections.

2. Citizens' information on natural resources will affect the levels of social cohesion, trust, and political accountability in the community.
3. Citizens' information on natural resources will affect rent-seeking behaviour by citizens.
4. Citizens' information on natural resources will affect citizens' political participation.
5. Elite information on natural resources will affect citizens' behaviour in A3-A5.

C. Aspirations

1. Having citizens who are exposed to testimonies from other citizens will affect elite's provision of public goods and investment in political connections.
2. Being exposed to testimonies from other citizens will affect the levels of social cohesion, trust, and political accountability in the community.
3. Being exposed to testimonies from other citizens will affect the rent-seeking behaviour of citizens.
4. Being exposed to testimonies from other citizens will affect citizens' political participation.
5. Being exposed to testimonies from other citizens will affect citizens' economic and social outcomes.

D. Deliberation

1. Giving deliberation power to the citizens will affect elite's provision of public goods and investment in political connections.
2. Giving deliberation power to the citizens will affect the levels of social cohesion, trust, and political accountability in the community.
3. Giving deliberation power to the citizens will affect rent-seeking behaviour by citizens.
4. Giving deliberation power to the citizens will affect citizens' political participation.
5. The type of deliberation system will affect elite's behaviour in C1 and C2.
6. The type of deliberation system will affect citizens' behaviour in C2-C4.

Methods

In this section, we present the methodology used to evaluate the effect of the different treatments explained in Section 2. The evaluation design for the comparison of different interventions examines differences in outcomes across individuals and households living in communities assigned to different treatment groups. Since the communities were allocated at random to different treatment groups, they are expected to be identical on average on all their other characteristics, observed or unobserved. A simple comparison across communities will give us the impact on outcomes of implementing one versus another intervention. Similarly, a comparison

of communities assigned to different treatment groups will identify the effect for community-level outcomes.

Identifying the effect of Information

We start by focusing on the general effect of providing information to either the elite or the community. For individual and household outcomes, let T_{im} be an indicator variable that takes value 1 if respondent (or household) i lives in a community m assigned to groups 1, 2 or 3, and equal to 0 if respondent i lives in a community m that is part of group 0. In order to estimate the effect of providing information on the outcome Y_{im} , we estimate the following model:

$$Y_{im} = \alpha + \beta T_{im} + X'_{im}\gamma + \varepsilon_{im} \quad (3)$$

where X_{im} be a vector of controls, including household and individual characteristics and geographical controls, and ε_{im} is a residual idiosyncratic error term picking up unobserved determinants of the outcome of interest. The impact on outcome Y_{im} of providing information as opposed of not providing any information is given by β .

Similarly, for community-level outcomes, we can estimate the effect of providing information comparing outcomes among communities allocated to different treatment groups. We plan to estimate the effect of information using the following equation:

$$Y_m = \alpha + \beta T_m + X'_m\gamma + \varepsilon_m \quad (4)$$

where X_m is a vector of community characteristics and ε_m is an error term idiosyncratic to the community. The interpretation of coefficients is similar to the one presented for the individual and household outcomes.

Another version of these models also controls for potential imbalances in the outcomes of interest at baseline, by including $Y_{im,t-1}$ in the model. Denoting t as the follow-up period and $t-1$ as the baseline period (as in equation 1) the model is:

$$Y_{im,t} = \alpha + \beta T_{im,t} + X'_{im,t}\gamma + \delta Y_{im,t-1} + \varepsilon_{im,t} \quad (5)$$

We will be especially confident of the robustness of our results for equations (1) and (3) are similar across these two specifications. Large differences across the results may indicate occasional imbalances in community characteristics at baseline, in spite of the randomization of interventions to communities.

Identifying the effect of elite information versus community information

In this section, we are interested at identifying the effect of providing information to the elite versus providing information to the community. For individual and household outcomes, similarly to the previous section, let $T1_{im}$ be an indicator variable that takes value 1 if individual (or household) i lives in community m assigned to group 1, and equal to 0 otherwise. Similarly, $T23_{im}$ is an indicator variable that takes value 1 if individual (or household) i lives in community m assigned to group 2 or 3, and equal to 0 otherwise. In this case, we can identify the effect of different interventions by estimating the following equation:

$$Y_{im} = \alpha + \beta_1 T1_{im} + \beta_{23} T23_{im} + X'_{im} \gamma + \varepsilon_{im} \quad (6)$$

where X_{im} be a vector of controls and ε_{im} is a residual idiosyncratic error term picking up unobserved determinants of the outcome of interest. The effect of providing information to the elite compared to not providing it is identified by β_1 , while the effect of providing information to the community compared to not providing it is identified by β_{23} . The object of interest is not only to test whether β_1 or β_{12} are different than zero, but we are also aiming at testing whether β_1 is different than β_{12} .

Similarly, for community-level outcomes, we can estimate the effect of providing information to the elite versus the community by estimating the following equation:

$$Y_m = \alpha + \beta_1 T1_m + \beta_2 T2_m + \beta_3 T3_m + X'_m \gamma + \varepsilon_m \quad (7)$$

where X_m is a vector of community characteristics and ε_m is an error term idiosyncratic to the community. The interpretation of coefficients is similar to the one presented for the individual and household outcomes.

Identifying the effect of elite information versus community information with aspirations versus community information with deliberation

In this section, we are interested at identifying the effect of each specific intervention. Similarly, to the previous section, let $T1_{im}$ be an indicator variable that takes value 1 if individual (or household) i lives in community m assigned to group 1 (Information to the elite), and equal to 0 otherwise. Let $T2_{im}$ be an indicator variable that takes value 1 if individual (or household) i lives in community m assigned to group 2 (Information to the elite + Information to the community), and equal to 0 otherwise. Let $T3_{im}$ be an indicator variable that takes value 1 if individual (or household) i lives in community m assigned to group 3 (Information to the elite + Information to the community + deliberation), and equal to 0 otherwise. In this case, we can identify the effect of different interventions by estimating the following equation:

$$Y_{im} = \alpha + \beta_1 T1_{im} + \beta_2 T2_{im} + \beta_3 T3_{im} + X'_{im} \gamma + \varepsilon_{im} \quad (8)$$

where X_{im} be a vector of controls and ε_{im} is a residual idiosyncratic error term picking up unobserved determinants of the outcome of interest. Similar to the previous section, the effect of providing information to the elite compared to not providing it is identified by β_1 . The effect of providing treatment for group 2 is identified by β_2 , while the effect of providing treatment for group 3 is identified by β_3 . The object of interest is not only to test whether β_1 or β_2 or β_3 are different than zero, but also to test whether β_1 is different than β_2 , whether β_1 is different than β_3 and whether β_2 is different than β_3 . Similarly, for community-level outcomes, we can estimate the effect of providing different interventions using the following equation

$$Y_m = \alpha + \beta_1 T1_m + \beta_2 T2_m + \beta_3 T3_m + X'_m \gamma + \varepsilon_m \quad (9)$$

where X_m is a vector of community characteristics and ε_m is an error term idiosyncratic to the community. The interpretation of coefficients is similar to the one presented for the individual and household outcomes.

Heterogeneous Effects of Alternative Interventions

In addition, we plan to control for heterogeneous treatment effects. To this purpose, for each sub-group k in the variable for which we want to control for heterogeneity in the effect, we define an indicator d_{ik} that takes value 1 if household/individual i belong to sub-group k and 0 otherwise. For individual and household outcomes, similarly to the previous section we then estimate the following model, where the impact on outcome Y_{im} of each treatment in sub-group k as opposed to the control group is given by β_{1k} , β_{2k} and β_{3k} :

$$Y_{im} = \alpha + \sum_k \beta_{1k} d_{ik} T1_{im} + \sum_k \beta_{2k} d_{ik} T2_{im} + \sum_k \beta_{3k} d_{ik} T3_{im} + \sum_k \eta_k d_{ik} + X'_{im} \gamma + \varepsilon_{im} \quad (10)$$

where X_{im} be a vector of controls and ε_{im} is a residual idiosyncratic error term picking up unobserved determinants of the outcome of interest. Similarly, we estimate the following model by controlling for $Y_{im,t-1}$ in order to check for potential imbalances in the outcomes at baseline.

$$Y_{im} = \alpha + \sum_k \beta_{1k} d_{ik} T1_{im} + \sum_k \beta_{2k} d_{ik} T2_{im} + \sum_k \beta_{3k} d_{ik} T3_{im} + \sum_k \eta_k d_{ik} + X'_{im} \gamma + \delta Y_{im,t-1} + \varepsilon_{im} \quad (11)$$

For community-level outcomes, for each sub-group k in the variable for which we want to control for heterogeneity in the effect, we define an indicator d_k that takes value 1 if community m belongs to sub-group k and 0 otherwise. We can then estimate the effect of providing information using the following equation:

$$Y_m = \alpha + \sum_k \beta_{1k} d_k T1_m + \sum_k \beta_{2k} d_k T2_m + \sum_k \beta_{3k} d_k T3_m + \sum_k \eta_k d_k + X'_m \gamma + \varepsilon_m \quad (12)$$

where X_m is a vector of community characteristics and ε_m is an error term idiosyncratic to the community.

Procedure for addressing limited variation

Following McKenzie (2012), in order to limit noise caused by variables with minimal variation, outcomes for which 97 percent of observations have the same value within the relevant sample will be omitted from the analysis.

Procedure for addressing multiple hypothesis testing

The large set of outcomes studied in this project raises concerns about multiple inference. The probability of erroneously rejecting at least one null hypothesis of no treatment impact naturally increases with the number of outcomes considered. In order to test for multiple outcomes, we will rely on the methodology proposed by Romano and Wolf (2005) to perform multiple hypothesis testing. By capturing the joint dependence structure of the individual test statistics on the treatment impacts, this procedure improves on the ability to detect false hypothesis of program impact.

Outcomes

In this section, we describe which are the main outcomes we will collect and how they relate to the hypothesis stated above. Most of these outcomes will be updated during the first stage of the project, while designing and piloting the measurement instruments. For organization purposes, we present the outcomes by data source. Hence, we show below 5 tables containing the name of

the outcome variable/indicator, a brief description of the outcome, a list of hypotheses it relates to, and the level of analysis.

The main source of heterogeneity in the impact is connected to the social position of the participant in the local community, whether he/she is leader or a citizen. This distinction is evident in the research questions and the way the hypotheses are stated. Nevertheless, we can expect other sources of variation of program impacts. This heterogeneity will mainly be captured through survey data outcomes, such as:

- i. *Aspirations* – individuals' initial level of aspirations might explain differences in the impact of the information and the deliberation treatment. For example, if an individual has very high expectations concerning natural resources, the information treatment might have a very different impact compared to one individual with no expectations, *ceteris paribus*;
- ii. *Demographic characteristics* – characteristics such as gender, education, occupation might help explain differences in heterogeneity of impacts;
- iii. *Information* – if individuals perceive the information transmitted in a different manner, this might explain differences in outcomes;
- iv. *Social capital* – individuals with different levels of social capital will face different opportunities concerning rent-seeking outcomes and political connections, for example;
- v. *Time and risk preferences* – individual's patience and risk attitudes are usual sources of heterogeneity of impacts;
- vi. *Wealth* – constructed using consumption of durable and non-durable goods, investment and assets. Households with different wealth constraints might be able to use the information in different manners and have different outcomes in terms of rent-seeking behaviour.

Table 10 – Outcomes measured using survey data

Outcome	Description	Hypothesis	Level
Aspirations	Expectations about future living conditions of the household, of the village, the region, and the country. Answers using a Likert scale. Answers will be compared with similar questions for present conditions.	B1-B5	IND
Consumption	Batch of consumption questions: quantities consumed in the last 7 days in the household. We will use average prices of goods by village to create a consumption index.	A3, B2, C3	HH
Demand for political accountability	Batch of self-reported indicators on perceived quality of institutions and demand for accountability.	A2, A5, B2, B3, C2, C6	IND
Durable goods	Batch of questions on the current value of durable goods the HH owns.	A3, B2, C3	HH
Income and Assets	Self-reported income and assets.	A3, B2, C3	IND/ HH
Information	Batch of questions to measure self-reported level of knowledge on natural gas exploration and revenues management.	A1-A4	IND
Investment in health and education	Batch of questions to measure household investment in health and education.	A3, B2, C3	HH
Social capital	Dyadic data on networks and distance to the leader.	A1-A3, A5, B1-B3, C1-C3, C5, C6	IND/ HH/ COMM
Time and Risk preferences	We will test between the standard multiple price list and more recent options that allow for non-linear utilities while piloting the measurement instruments.	B1-B5	IND
Trust	Self-reported trust towards institutions and political representatives.	A2, B2, C2, C6	IND
Public Goods	Public goods quantity and quality. List of public goods still to be constructed. Data will be collected by the enumerators team, and not self-reported.	A1-A3, A5, B1-B3, B5, C1-C6	COMM

Table 11 – Outcomes measured using the SCAs

Indicator	Description	Hypothesis	Level
Gift consumption and distribution	Measure the patterns of consumption over time of a gift to the community, which can be consumed privately	A1, A2, B1, B2, C1, C2, C5	Elite
Political appointments	Observe appointments of villagers aimed at specific tasks. Combine with network data collected in the surveys	A1, A2, B1, B2, C1, C2, C5	Elite
Investment in political connections	Observe the spending of personal resources on communication with province-level party representatives	A1, A2, B1, B2, C1, C2, C5	Elite
Social cohesion	Recording citizens' propensity to match local (matching) grants	A2, A4, B2, B4, B5, C2, C6	Citizens
Investment in public goods	Observing citizens' degree of participation in community discussions deciding on a public good	A2, A4, B2, B4, B5, C2, C6	Citizens
Rent-seeking	Observe citizens rent-seeking behaviour - still to be designed.	A3, A5, B3, B5, C3, C6	Citizens

Table 12 – Outcomes measured using behavioural games

Indicator	Description	Hypothesis	Level
Dictator game	Behavioural measurement of elite's willingness to share resources with the citizens.	A1, B1, C1, C5, C6	Elite
Trust game	Behavioural measurement of citizens' trust on local leaders.	A2, B2, C2	Citizens
Public good game	Behavioural measurement of social cohesion.	A2, B2, C2	Citizens

Table 13 – Outcomes measured using electoral data

Indicator	Description	Hypothesis	Level
Political participation: turn-out	Turn-out data collected from local and national elections.	A4, B4, C4	COMM
Political participation: vote	Electoral data collected from local and national elections.	A2, A5, A6, B2, B4, C2, C4	COMM

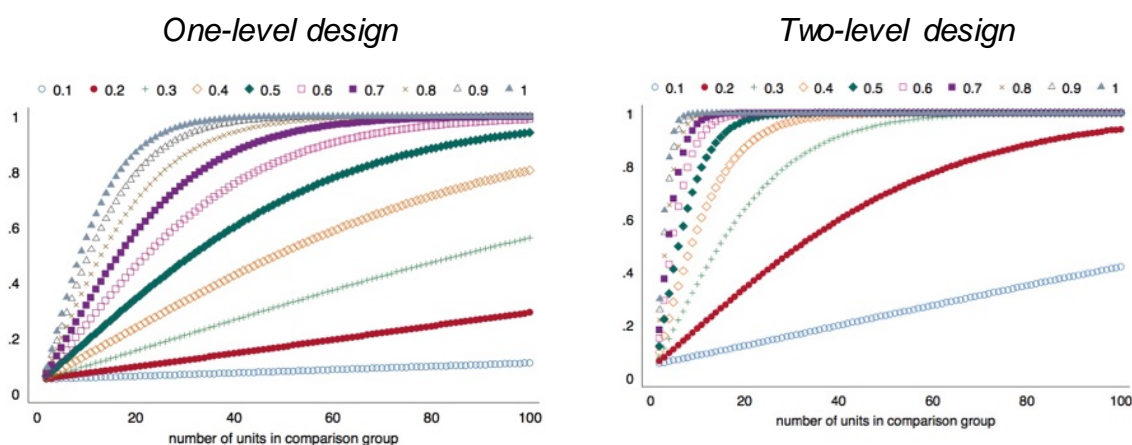
Table 14 – Outcomes measured using qualitative data

Indicator	Description	Hypothesis	Level
Quality of deliberation process	Quality measurement of the deliberation process - reported by the organizer responsible for each deliberation group	C1-C6	COMM
Open interviews at end-line	These will allow us to better understand the mechanisms behind the impacts	All	COMM/ HH

Appendix. Sample size and power calculations

This study involves measuring outcomes at both the community and individual levels. Community level outcomes are part of a single or one-level experimental design. Individual level outcomes involve clustering at the community level and are considered through a two-level design. We present power calculations for one-level and two-level designs with varying levels of standardized effect sizes (from 0.1 to 1). Figure 14 presents the power calculations for the one-level and the two-level designs. In the *one-level design*, we have 50 villages for each comparison group when considering outcomes at the community level. We need relatively high effects to be able to capture these impacts with 80 percent statistical power. Specifically, the minimum detectable effect size (standardized units) for 50 units is 0.57 (see intersection of the different curves in Figure 14 with the 0.8 level of power in the y-axis). In the *two-level design*, we observe 10 households within each of the 50 villages per treatment arm. To compute the intra-cluster correlation (ICC), we looked at a series of outcomes identified in the pre-analysis plan, and we averaged the ICCs computed for each of these outcomes. We obtain an ICC estimate of 0.068, in line with the ICC of 0.06 used for the original design of the intervention, which was based on Aker et al. (2013). With an ICC of 0.068, we can identify (with 80 percent of power) a minimum detectable size effect of 0.227.

Figure 9 – Power calculations



Note: power calculations are computed using the Stata command `rdpower`.

To approximate the effect sizes in units of each of the outcomes, we focus on the outcome variables identified in the pre-analysis plan. Since standardized effects correspond to the difference in means (across two groups) divided by the standard deviation of the two groups together, we need to multiply our standardized effects by the referred standard deviation. In Table 15, we present the mean, standard deviation and ICC of the selected outcomes in columns (1) to (3). Column (4) presents the standardized effect size based on the evaluation design (50 clusters in control and 50 clusters in treatment and 10 households in each clusters) and the ICC computed using the baseline survey. We implement in this case a model without covariates (unconditional model). We supplement the standardized effect size with the minimum detectable effects (MDEs) for the main variables of interest by multiplying it by the standard deviation of the variable. In addition, in columns (6) to (9), we compute the standardized effect size when we control for basic baseline characteristics.¹⁷ We first compute R^2 by regressing the outcome variable at the household level and at the village level on the selected covariates. We then compute standardized

¹⁷ We consider the same covariates as in the main analysis for individual-level regressions. See Section 3.3.

effect size and MDE. Since we include only a very restricted set of controls, this represents a conservative estimate of the gain in power obtained by using baseline information.

Table 15 – Minimum detectable effects

	Mean	Std. Dev.	ICC	Without covariates		With covariates			
				Std. Effect size	MDE	R ²	R ²	Std. Effect size	MDE
						(hh. level)	(village level)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Average Trust	0.75	0.25	0.07	0.23	0.06	0.25	0.25	0.25	0.25
Trust: Provincial Government	2.34	0.89	0.05	0.22	0.19	0.25	0.25	0.25	0.25
Trust: National leaders	2.28	0.90	0.04	0.21	0.19	0.25	0.25	0.25	0.25
Public funds to influent people	0.56	0.50	0.04	0.21	0.10	0.25	0.25	0.25	0.25
Active member/leader in group	0.22	0.41	0.03	0.20	0.08	0.25	0.25	0.25	0.25
Knows any influential person	0.41	0.49	0.10	0.24	0.12	0.25	0.25	0.25	0.25

Note: To compute the R², We consider the same covariates as in the main analysis for individual-level regressions. See Section 3.3.

Appendix. Descriptive statistics

For each outcome of household/leader i living in community j , Y_{ij} , we test for balance by first using the following least squares regression:

$$Y_{ij} = \alpha + \beta T_j + \varepsilon_{ij} \quad (13)$$

where T_j is an indicator variable for living in a community in either treatment groups 1, 2, or 3 and ε_{ij} is an individual-specific error term which is assumed to be clustered at the community level. We then look at balance specifically within each treatment group, by estimating the following specification:

$$Y_{ij} = \alpha + \beta_1 T_{1j} + \beta_2 T_{2j} + \beta_3 T_{3j} + \varepsilon_{ij} \quad (14)$$

where T_{1j} , T_{2j} and T_{3j} are indicator variables for living in a community in treatment groups 1, 2, and 3 and ε_{ij} is an individual-specific error term which is assumed to be clustered at the community level. We test for jointly-significance of β_1 , β_2 and β_3 by using an F-test.

We begin by looking at household-level outcomes. Table 16 presents randomization checks for respondent, leader, and community characteristics. Table 17 presents the main correlates of awareness about the natural gas discovery at baseline.

Table 16 – Descriptive Statistics

	Control Group	Any treatment	Treatment Group			Joint test (3)-(5)
	(1)		Info to Leader	Info to Leader and Citizens	Info plus Deliberation	
	mean	diff.	diff.	diff.	diff.	p-value
	[std.dev.]	(std.err.)	(std.err.)	(std.err.)	(std.err.)	[N]
Individual Characteristics						
Female respondent	0.274 [0.446]	-0.032 (0.027)	-0.036 (0.034)	-0.035 (0.036)	-0.026 (0.034)	0.682 [2065]
Age in years	44.880 [16.860]	0.233 (1.010)	0.303 (1.298)	0.618 (1.255)	-0.231 (1.176)	0.907 [2057]
Household size	5.588 [2.861]	0.131 (0.172)	-0.098 (0.198)	0.293 (0.239)	0.193 (0.198)	0.256 [2063]
No formal education	0.310 [0.463]	-0.020 (0.027)	-0.022 (0.032)	-0.017 (0.033)	-0.020 (0.035)	0.898 [2065]
Primary education	0.575 [0.495]	0.003 (0.030)	0.025 (0.036)	0.012 (0.037)	-0.029 (0.037)	0.507 [2065]
Secondary or higher education	0.114 [0.319]	0.017 (0.024)	-0.002 (0.027)	0.004 (0.027)	0.050 (0.035)	0.451 [2065]
Years of schooling	3.690 [3.405]	0.067 (0.237)	0.004 (0.274)	-0.114 (0.269)	0.314 (0.325)	0.579 [2065]
Muslim	0.555 [0.497]	0.017 (0.060)	0.015 (0.075)	0.046 (0.073)	-0.009 (0.072)	0.877 [2065]
Macua ethnic group	0.599 [0.491]	0.048 (0.065)	0.083 (0.081)	0.031 (0.081)	0.031 (0.082)	0.783 [2065]
Maconde ethnic group	0.294 [0.456]	-0.044 (0.063)	-0.054 (0.078)	-0.061 (0.075)	-0.018 (0.078)	0.834 [2065]
Semi-urban	0.109 [0.312]	0.005 (0.049)	-0.009 (0.060)	-0.008 (0.060)	0.031 (0.065)	0.926 [2065]
Urban	0.091 [0.288]	-0.031 (0.043)	-0.031 (0.051)	-0.032 (0.051)	-0.031 (0.051)	0.914 [2065]
Trust index	0.751 [0.246]	0.005 (0.017)	-0.003 (0.020)	-0.003 (0.020)	0.022 (0.022)	0.591 [1949]
Public funds to influent people	0.550 [0.498]	0.013 (0.028)	0.009 (0.035)	0.015 (0.034)	0.014 (0.036)	0.970 [1907]
Ever heard about the natural gas	0.487 [0.500]	0.001 (0.047)	-0.053 (0.056)	0.024 (0.055)	0.031 (0.058)	0.403 [2064]
Leader Characteristics						
Female respondent	0.036 [0.189]	-0.016 (0.024)	-0.036 (0.030)	0.003 (0.030)	-0.016 (0.030)	0.556 [206]
Leader's age	54.091 [10.624]	0.505 (1.556)	0.549 (1.940)	0.517 (1.930)	0.449 (1.940)	0.991 [206]
Years of schooling	6.200 [2.946]	-0.783* (0.446)	-0.500 (0.554)	-0.631 (0.551)	-1.220** (0.554)	0.182 [206]
Village Characteristics						
Natural resources index	0.044 [0.060]	-0.001 (0.010)	-0.014 (0.012)	0.013 (0.012)	-0.004 (0.012)	0.180 [206]
Infrastructure index	0.483 [0.150]	0.014 (0.025)	0.00 (0.031)	0.032 (0.031)	0.010 (0.031)	0.703 [205]

Note: *** p<0.01, ** p<0.05, * p<0.1. Column (1) reports sample mean and standard deviation in brackets for the control group. Column (2) reports the difference between all treatment groups pooled together and the control group using an OLS regression of the corresponding characteristic on the treatment indicator. Columns (3)-(5) report the difference between each treatment group and the control group. Standard errors clustered at community level are reported in parentheses. Column (5) presents a joint test of significance of the coefficients for each treatment dummy.

Table 17 – Correlates of awareness and knowledge at baseline

Dep.Var.	Awareness		Knowledge	
	(1)	(2)	(3)	(4)
Female respondent	-0.186*** (0.025)	-0.207*** (0.024)	-0.126*** (0.017)	-0.143*** (0.016)
Age in years	0.014*** (0.004)	0.014*** (0.003)	0.010*** (0.002)	0.010*** (0.002)
Age in years (squared)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Household size	0.014*** (0.003)	0.009*** (0.003)	0.009*** (0.002)	0.006*** (0.002)
Primary education	0.069*** (0.023)	0.080*** (0.021)	0.054*** (0.016)	0.057*** (0.014)
Secondary or higher education	0.378*** (0.039)	0.335*** (0.037)	0.284*** (0.028)	0.234*** (0.025)
Muslim	0.136*** (0.026)	0.005 (0.026)	0.094*** (0.018)	-0.009 (0.017)
Macua ethnic group	-0.288*** (0.040)	-0.032 (0.033)	-0.225*** (0.032)	-0.023 (0.023)
Maconde ethnic group	0.131*** (0.048)	-0.020 (0.053)	0.044 (0.036)	-0.022 (0.036)
Group membership	0.153*** (0.025)	0.150*** (0.025)	0.100*** (0.017)	0.104*** (0.016)
Infrastructure index		-0.080 (0.101)		-0.068 (0.076)
Natural resources index		-0.137 (0.221)		-0.122 (0.143)
Village has a market		0.030 (0.029)		0.019 (0.019)
Polling Station size		0.004 (0.008)		0.004 (0.005)
Below median distance from Palma		0.053 (0.052)		0.057 (0.036)
Leader's age		-0.003 (0.010)		-0.002 (0.007)
Leader's age (squared)		0.000 (0.000)		0.000 (0.000)
Leader has Primary education		0.048 (0.077)		0.030 (0.047)
Leader has Secondary or higher education		0.021 (0.079)		0.013 (0.049)
Observations	1958	1940	1958	1940
R-squared	0.245	0.349	0.256	0.398
Village Controls	No	Yes	No	Yes
Household Controls	Yes	Yes	Yes	Yes

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in parenthesis and clustered at village level. Depending on the column, the dependent variables are defined by the following: (1)-(2) Awareness: indicator variable equal to 1 if the respondent reports having heard about the natural gas discovery; (3)-(4) Knowledge: index built averaging 12 indicator variables concerning knowledge of whether the government is receiving revenues from natural gas extraction, about the firms involved, and about the location of the discovery.

Appendix. Information Package

APRESENTAÇÃO

Bom dia. O meu nome é [mencionar nome]. Eu colaboro com a Associação NOVAFRICA que é uma instituição de pesquisa que juntamente com outras instituições: [mencionar nomes], está a estudar as expectativas dos Moçambicanos sobre a exploração de recursos naturais.

Estamos aqui hoje para fazer uma capacitação sobre os recursos naturais existentes em Cabo Delgado e para isso gostaríamos de contar com a atenção e colaboração de todos. Sempre que tiverem alguma dúvida ou questão ao que for dito sintam-se à vontade para participar. Mas por favor vamos fazê-lo pondo o braço no ar. Desde já muito obrigado a todos por estarem presentes!

INTRODUÇÃO

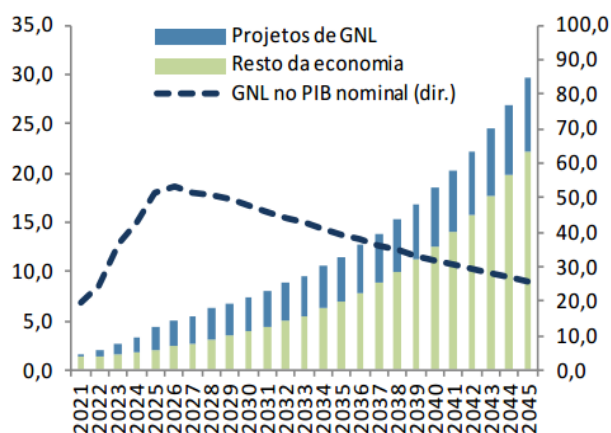
Moçambique é um país com muitas ocorrências de minérios. As indústrias de exploração de gás natural, jazigos de carvão, ferro, pedras preciosas e minerais pesados estão em expansão. O sector das indústrias extractivas oferece potencialidades de investimento e geração de riqueza.¹⁸

Nos últimos anos, Moçambique descobriu grandes quantidades de gás natural, a maior parte das quais foram encontradas na província de Cabo Delgado. Espera-se que esta descoberta de gás em Cabo Delgado atraia volumes significativos de investimento para o país. As previsões do FMI são de que durante a década de 2020, a indústria de gás natural representará metade da riqueza do país¹⁹. Estes dados mostram que o futuro da economia moçambicana poderá vir a ser fortemente influenciado pelas receitas geradas pela extracção de gás natural, tornando assim Moçambique num dos potenciais produtores de gás do mundo.

Para além do gás natural, a província de Cabo Delgado é detentora de potenciais reservas de outros minérios como o rubi, o mármore e o grafite²⁰. Os recursos florestais e recursos pesqueiros são também predominantes.

Dada a importância dos recursos naturais para a economia moçambicana, o objectivo do projecto que estamos a apresentar é capacitar as comunidades em relação a estas descobertas, e explicar o que podem vir a esperar destes recursos hoje e no futuro usando para isso informações

Participação dos projetos de GNL no PIB nominal
(Biliões de metcais, percentagem)



Credit: International Monetary Fund.

¹⁸ IESE, Instituto de Estudos Sociais e Económicos: "Exploring natural resources in Mozambique, will it be a blessing or a curse?", 2007:

http://www.iese.ac.mz/lib/publication/Bucuane,Aurelio%20&%20Mulder,Peter_NaturalReseources.pdf

¹⁹ FMI, International Monetary Fund, Country Report No. 16/10 (Janeiro, 2016):

<http://www.imf.org/external/pubs/ft/scr/2016/cr1609.pdf>

²⁰ MIREME, Ministério dos Recursos Minerais e Energia:

http://www.mireme.gov.mz/index.php?option=com_content&view=article&id=20&Itemid=153

disponibilizadas pelas entidades que estão envolvidas nos processos de exploração (empresas exploradoras, instituições governamentais, outras instituições de carácter independente e sociedade civil), bem como na lei moçambicana.

O QUE SÃO RECURSOS NATURAIS?

[Dar tempo para as pessoas discutirem. Se não estiverem a dizer nada, perguntar:

As árvores são um recurso natural? – discussão

A igreja/templo/mesquita é um recurso natural? – discussão

A terra e as areias são um recurso natural? – discussão]

Os recursos naturais são materiais ou substâncias existentes na Natureza que podem ser explorados para obtenção de benefícios económicos²¹, bem como para sobrevivência. O solo, ar, água, as plantas, os animais, ou ainda a energia fóssil como o gás natural ou o carvão são considerados como recursos naturais. Os recursos naturais representam assim, todos os elementos que estão na natureza e que são necessários para as pessoas, directa ou indirectamente na satisfação das suas necessidades.

[Perguntar: Quais são os recursos naturais que existem aqui na comunidade? – Fazer uma lista]

Os recursos naturais podem ser classificados em dois tipos:

- **Renováveis** – quando após o seu uso voltam a estar disponíveis, não têm fim (por exemplo, o sol e o vento);
- **Não renováveis** – quando não podem ser recuperados num curto período de tempo e por isso têm um fim (por exemplo, o carvão, a madeira ou o gás).

[Usando a lista dos recursos naturais elaborada anteriormente, pedir à audiência para dividir os recursos existentes, em renováveis e não renováveis.]

GESTÃO SUSTENTÁVEL DOS RECURSOS NATURAIS

Uma vez que a maior parte dos recursos naturais que utilizamos são não-renováveis e por isso à medida que são explorados as suas reservas vão diminuindo, um dia terão um fim. Por isso, é necessário que se faça uma gestão sustentável dos mesmos. Uma gestão sustentável dos recursos naturais significa que a sua extracção deve ser feita de modo a que o seu benefício seja suficiente para todos, tanto para as gerações de hoje como para as gerações do futuro. De igual modo, é importante garantir que o rendimento proveniente destas explorações seja aplicado em desenvolvimento duradouro, isto é, desenvolvimento que se propague por hoje e pelas gerações futuras, por exemplo na criação de infra-estruturas de longo-prazo que servem as populações.

Assim, é essencial fazer a extracção de recursos em primeiro lugar respeitando e preservando o ambiente e em segundo, aplicando os benefícios da extracção que é feita em desenvolvimento

²¹ Oxford Dictionaries: https://en.oxforddictionaries.com/definition/natural_resources

económico e social de modo a que possam ser aproveitados de forma igual por todos os cidadãos de hoje, bem como por todos os cidadãos das próximas gerações.

O que diz a lei - Direito à preservação do ambiente

Decreto nº 54/2015 – artigos 8 e 9

Todas as actividades susceptíveis de causar impactos sobre o ambiente, devem ser objectos de pré-avaliação. Os resultados da avaliação da actividade proposta serão determinados com base nos seguintes factores:

1. Número de pessoas e comunidades abrangidas;
2. Ecossistemas, plantas e animais afectados, e a sua importância para a biodiversidade e os serviços do ecossistema;
3. Localização e extensão da área afectada;
4. Reversibilidade do impacto;
5. Identificação de potenciais impactos;
6. Elementos do projecto.²²

TIPOS DE RECURSOS NATURAIS

Os recursos naturais mais importantes existentes na província de Cabo Delgado são:

1. Recursos Minerais – como o calcário, o mármore, o ouro, a areia, o rubi e o grafite;
2. Recursos Florestais – como a madeira e o carvão vegetal;
3. Recursos Pesqueiros – todos os peixes que são pescados do mar;
4. Gás Natural – combustível fóssil com diferentes utilizações.

1. Recursos Minerais

Os recursos minerais são substâncias naturais existentes na terra cujas características fazem com que a sua exploração económica seja lucrativa. Existem diferentes tipos de recursos minerais em Cabo Delgado. Para além do gás natural, os principais minérios existentes na província são:

- *Calcário* – serve como matéria-prima na produção de cimento, cal e vidro; é também usado na agricultura e na pavimentação de vias de acesso.
- *Grafite* – foram descobertas em Balama cerca de 564 milhões de toneladas, indicando a possibilidade de produção anual de 220 mil toneladas de grafite por ano, um investimento

²² O Decreto nº 94/2014 regula a gestão de resíduos urbanos produzidos pelas actividades económicas tais como matéria orgânica, papel ou cartão, entulho, plástico, vidro, metal, têxteis, borracha, resíduos domésticos volumosos ou resíduos especiais.

estimado em 120 milhões de dólares.²³ Uma das aplicações mais importantes do grafite é no fabrico de lápis. Para além disso, é utilizado para fabrico de pilhas, baterias e outros.

- *Pedras semi-preciosas* – encontram-se a turmalina, a granada, o topázio, entre outras. As pedras semi-preciosas são principalmente usadas na produção de jóias e ornamentação.
- *Pedras preciosas* – são principalmente o rubi e a safira e caracterizam-se pelo seu elevado valor económico sendo usadas essencialmente no fabrico de jóias e ornamentação.
- *Metais preciosos* – inclui-se nesta categoria o ouro, que tem a mesma utilidade que as pedras preciosas.

Os recursos minerais são regulados por lei de acordo com a Lei de Minas que rege em que termos estes recursos podem ser explorados para fins de actividade económica.

2. Recursos Florestais

Os recursos florestais têm também um forte valor económico para as famílias, quer como material de construção, quer para a produção de energia (lenha e carvão vegetal). As áreas florestais em Cabo Delgado ocupam cerca de 3 milhões de hectares, o que corresponde a cerca de 39.4% (um pouco menos de metade) do território da província. Das espécies florestais existentes, destaca-se o pau preto e o tule (madeiras preciosas), a umbila, o jambire, a chanfuta, o pau-ferro e o mutondo (espécies de primeira qualidade). O potencial florestal existente aponta para uma capacidade de abate médio anual, das diferentes espécies florestais, de cerca de 60 mil metros cúbicos.²⁴ Os recursos florestais são regulados pela Lei das Florestas e Fauna Bravia.

3. Recursos Pesqueiros

A pesca é para Moçambique um importante recurso para o desenvolvimento da economia familiar e nacional, cuja actividade de exploração constitui fonte de rendimento para muitas famílias.²⁵ Segundo o recenseamento de pesca artesanal de 2007, existem, na província de Cabo Delgado, 21.521 pescadores, dos quais 14.261 possuem 197 centros de pesca e 4.764 artes de pesca (instrumentos de pesca tais como redes, anzóis, gaiolas, gamboas, etc.). Ainda de acordo com o mesmo recenseamento, na baía de Pemba e em Pemba-Metuge há 3.981 pessoas que praticam a actividade piscatória. Esta actividade é regulada pela Lei das Pescas.

4. Gás Natural

Foram descobertas em Cabo Delgado grandes quantidades de gás natural. As reservas de gás natural descobertas na província podem colocar Moçambique como um dos grandes produtores de gás natural no mundo.²⁶ Desde que a produção de gás atinja o seu ponto máximo, Moçambique

²³ BNI, Banco Nacional de Investimento (Setembro, 2013):

http://www.bni.co.mz/estudos/noticias.aspx?n=os_projectos_de_extrac%C3%A7%C3%A3o_de_carv%C3%A3o_mineral_v%C3%A3o_iniciar-se_em_2014&nid=2940

²⁴ Direcção Provincial do Turismo de Cabo Delgado: http://www.turismocd.gov.mz/areas/floresta/areas_floresta_pt.htm

²⁵ Ministério do Mar, Águas Interiores e Pescas: “Plano Director das Pescas, 2010-19”: http://www.mozpesca.gov.mz/Plano_Director_das_Pescas_2010-2019.pdf

²⁶ CIP, Centro de Integridade Pública, “Estabelecendo as bases para evitar a “maldição dos recursos” em Moçambique no novo “super-ciclo” do preço das matérias-primas (Maio, 2016):

pode tornar-se no terceiro maior exportador de gás do mundo, logo a seguir ao Qatar e à Austrália²⁷. Desde então, tem-se desenvolvido a planificação de grandes projectos de modo a que se possa extrair o gás. Está planeado um investimento sem precedentes em Moçambique, com a criação de gasodutos e instalações de processamento e transporte, infraestruturas que são necessárias de construir para retirar o gás do mar e o transportar até terra.²⁸ Este projecto, assim que se concretizar, contribuirá para a criação de receita e riqueza para a economia moçambicana, tendo potencial para se tornar um motor para o desenvolvimento económico do país.

O que é o gás natural?

[Perguntar: Quem aqui sabe o que é o gás natural? – pedir para levantar o braço. Pedir a uma das pessoas que sabe para explicar o que é o gás.]

Segundo as Lei das Minas e de Petróleos, gás natural define-se como “o petróleo que nas condições atmosféricas normais se encontra no estado gasoso, bem como gás não convencional”. Por outras palavras, o gás natural é uma fonte de energia de origem natural. Encontra-se na Natureza, normalmente em reservatórios profundos no solo ou no mar.

O gás é uma das fontes de energia mais importantes do mundo, logo a seguir ao petróleo e ao carvão. Após se extrair e antes de ser distribuído, passa por uma unidade de processamento, na qual são retiradas impurezas como água, outros gases e areias, entre outros componentes, até ser mais facilmente transportado. Assim, para que o gás saia do mar ou do solo e seja transportado é necessário construir infraestruturas como fábricas de extracção e processamento do gás natural e condutas de transporte.

Para que serve o gás natural?

[Perguntar: O que acham que podemos fazer com o gás que está no mar? Será que dá para cozinhar com xima, quando acaba a farinha lá em casa? Ou será que dá para pôr no chá? (a resposta é não também) - discussão]

O gás natural serve para diferentes efeitos. Em geral o gás é usado como combustível de automóveis que serve como substituto à gasolina e ao diesel por ser mais limpo e amigo do ambiente. De igual modo, é utilizado nas indústrias para obtenção de energia e nas residências para aquecimento, chuveiros, fogão, água entre outros.

O Ministério dos Recursos Minerais e Energia, em conjunto com o Instituto Nacional dos Petróleos, no Plano Director do Gás cujo horizonte temporal é de 20 anos definiu as principais formas em que o gás encontrado em Moçambique vai servir o mercado nacional e internacional:²⁹

- a) **Uso do gás natural para a geração de electricidade:** este sector assume uma importância particular pois o fornecimento de electricidade com qualidade e segurança constitui

http://cipmoz.org/images/Documentos/Industria_Extativa/463_CIP%20-%20pais%20rico%20em%20recursos%20vf.pdf

²⁷ FMI, International Monetary Fund, Country Report No. 16/10 (Janeiro, 2016): <http://www.imf.org/external/pubs/ft/scr/2016/cr1609.pdf>

²⁸ CIP, Centro de Integridade Pública, “Gás para Desenvolvimento ou apenas dinheiro?” (Agosto, 2015): http://cipmoz.org/images/Documentos/Industria_Extativa/372_gas_domestico_-_portugues.pdf

²⁹ INP e MIREME, Plano Director do Gas Natural (Junho, 2014): http://www.inp.gov.mz/pt/Políticas-Regime-Legal/Políticas/PLANO-DIRECTOR-DO-GAS-NATURAL_Junho2014

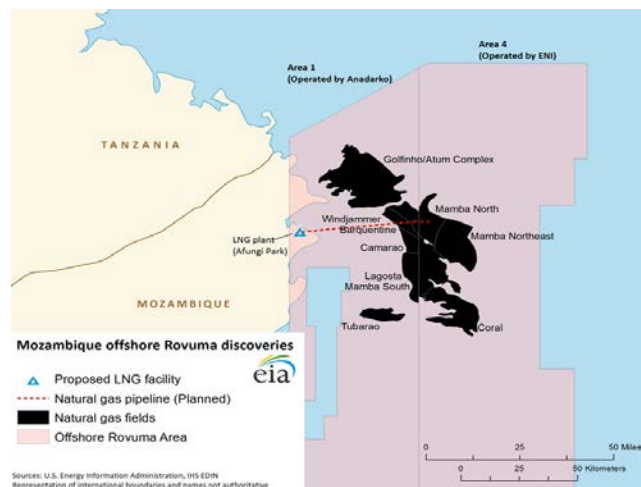
necessidade básica para o desenvolvimento de qualquer projecto, independentemente da sua dimensão.

- b) **Grandes consumidores industriais:** estes utilizam o gás como matéria-prima para a produção de fertilizantes (ureia), metanol e gases liquefeitos ou nos processos de transformação para aquecimento/electricidade (fundição de alumínio, siderurgias, petroquímicas, refinação, etc.). Este conjunto de grandes consumidores industriais é geralmente considerado âncora (relacionado com a conhecida noção de mega-projectos), pela enorme quantidade de gás usado.
- c) **Pequenas e Médias Empresas:** promovem o uso industrial e comercial em pequenas quantidades, fundamentalmente para processos de aquecimento, secagem, cozinha, etc. Nesta categoria encontra-se também o uso no transporte rodoviário (autocarros, camiões, automóveis, etc.).

Este Plano Director do Gás Natural mostra o empenho por parte do governo e outros agentes na criação de instrumentos que garantam aspectos sociais da exploração. O Plano Director tem um enquadramento específico para a protecção social às comunidades.

Onde foi descoberto/Por quem foi descoberto?

Uma grande reserva de gás natural foi descoberta na bacia do rio Rovuma, na zona norte de Moçambique ao largo do distrito de Palma. Após investimentos em actividades de pesquisa, foi encontrado gás no fundo do mar pela companhia norte-americana ANADARKO, mais especificamente em 7 poços, e pela italiana ENI em mais duas zonas marítimas.³⁰ Outras companhias estão também envolvidas no projecto para exploração do recurso, como a Empresa Nacional de Hidrocarbonetos (ENH) pertencente ao estado moçambicano, a empresa portuguesa Galp, a norueguesa Statoil, a Petronas, empresa da Malásia, a Exxon Mobil, empresa norte-americana, entre outras.



No total, as reservas estão estimadas em mais de 180 triliões de pés cúbicos³¹, o suficiente para colocar Moçambique como um dos países com mais gás do mundo. 1 trilião de pés cúbicos é suficiente para cobrir toda a cidade de Maputo até uma altitude de 82 metros (aproximadamente a altura de um edifício de 23 andares).³² As descobertas feitas em Cabo Delgado estão entre as

³⁰ ENH, Empresa Nacional de Hidrocarbonetos: <http://www.enh.co.mz/Projectos/Projectos-em-Carteira/Projecto-de-LNG-em-Cabo-Delgado>

³¹ FMI, International Monetary Fund, Country Report No. 16/10 (Janeiro, 2016): <http://www.imf.org/external/pubs/ft/scr/2016/cr1609.pdf>

³² CIP, Centro de Integridade Pública: "Gas for Development or just for money?" (2015): http://www.cip.org.mz/cipdoc/373_domestic%20gas.pdf

descobertas de gás natural mais importantes dos últimos anos.³³ O investimento total que será feito no projecto é esperado que ultrapasse os 100 mil milhões de dólares, mais de 6 vezes das receitas geradas pela economia de todo o país no ano passado. As receitas fiscais provenientes do projecto desde o início até 2045 podem atingir os 500 mil milhões de dólares, mais de 34 vezes das receitas geradas pela economia do país no ano passado³⁴. Contudo, prevê-se que nos primeiros anos estas receitas sejam moderadas, dado o grande custo inicial para arranque do projecto.

A exploração do gás já começou?

[*Perguntar*: Quem acha que já se começou a explorar o gás? Por favor essas pessoas ponham por favor o braço no ar! Quem acha que ainda não se começou a explorar o gás? Por favor ponham o braço no ar também.]

De modo a desenvolver-se o projecto, terão de ser criadas infraestruturas para trazer o gás do mar para terra. O projecto de gás natural liquefeito (GNL) que se pretende desenvolver em Cabo Delgado tem o objectivo de reunir, processar e exportar o gás natural que será extraído na Bacia do Rovuma. Este GNL será utilizado como uma fonte de energia em Moçambique e em outros países para onde vai ser exportado.³⁵ O processo tem previsto a criação das seguintes infraestruturas:³⁶

- No mar – criação de uma fábrica flutuante que irá retirar o reservatório de gás debaixo do leito do mar por meio de poços submarinos;
- Perto de terra – construção de docas de apoio permitindo a recepção dos materiais e equipamentos trazidos do mar;
- Em terra – construção de uma fábrica de processamento de gás natural liquefeito e de todas as infraestruturas associadas como residências, escritórios, aeroporto etc.

Até agora ainda não foi retirado gás do mar para ser vendido. A exploração está prevista começar a partir de 2020.³⁷

A Lei dos Petróleos assegura que o gás natural para além de exportado seja consumido no mercado nacional de acordo com o artigo 35 da mesma lei. Deste modo, o gás natural descoberto na Bacia do Rovuma servirá também para fornecer o mercado nacional para além de ser exportado para países estrangeiros.

[*Perguntar*: Quem é que acertou então na resposta à última pergunta?]

GÁS NATURAL EM INHAMBANE

³³ Mozambique LNG, “Environmental Impact Assessment (EIA) Report for the Liquefied Natural Gas Project in Cabo Delgado”: <http://www.mzlng.com/Responsibility/Environmental-Social-Management/>

³⁴ FMI, International Monetary Fund, Country Report No. 16/10 (Janeiro, 2016): <http://www.imf.org/external/pubs/ft/scr/2016/cr1609.pdf>

³⁵ ENH, Empresa Nacional de Hidrocarbonetos: <http://www.enh.co.mz/Projectos/Projectos-em-Carteira/Projecto-de-LNG-em-Cabo-Delgado>

³⁶ Anadarko, “Environmental Impact Assessment (EIA) Report for the Liquefied Natural Gas Project in Cabo Delgado”: <http://www.mzlng.com/Responsibility/Environmental-Social-Management/>

³⁷ Oxford Institute for Energy Studies: “Mozambique’s LNG revolution: a political risk outlook for the Rovuma LNG ventures” (Junho, 2014): <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/04/NG-86.pdf>

O projecto de gás natural na província de Inhambane em Pande e Temane foi o primeiro empreendimento de produção comercial de gás em Moçambique. A produção iniciou em 2004 e o projecto inclui um gasoduto de 865 quilómetros, que transporta gás de Temane, Moçambique, a Secunda, na África do Sul.³⁸

A exploração e produção são feitas pela Sasol Petroleum Teman (SPT), uma subsidiária da companhia sul-africana Sasol; a Companhia Moçambicana de Hidrocarbonetos (CMH), que é uma subsidiária da ENH; e pela International Finance Corporation (IFC), um braço comercial do Banco Mundial para o sector privado.

O gás produzido em Inhambane está a ser exportado para a África do Sul. Este exemplo mostrou a importância de haver uma parte do gás direccionada para o consumo do mercado nacional, tal como se espera que aconteça com o gás descoberto na Bacia do Rovuma. Em segundo lugar, o projecto de gás teve em si a particularidade de criar escassos postos de trabalho directos, e por isso, verificou-se que é importante criar indústrias de apoio e logística para capitalizar o capital humano nos novos projectos de gás que serão implementados no futuro.

IMPORTÂNCIA DOS RECURSOS NATURAIS PARA AS COMUNIDADES

De acordo com a Constituição da República de Moçambique, a terra é propriedade do Estado, isto é, pertence a todos os cidadãos moçambicanos,³⁹ e o Estado define as condições e os termos da sua utilização em benefício dos cidadãos. Quando os recursos são encontrados em território moçambicano, todos os cidadãos têm o direito de os explorar, respeitando as leis existentes para os diferentes tipos de recursos, ou de usufruir dos benefícios da sua exploração quando esta é feita por terceiros.⁴⁰

Assim, os recursos naturais são de todos, e todos podem beneficiar da sua exploração. Para além disso, dado que alguns recursos são não-renováveis e como tal escassos, a sua exploração deve ser feita tendo em conta as necessidades de hoje e também das gerações futuras. Como diz o MIREME: Os recursos minerais acabam. A duração da sua exploração depende das reservas (quantidades) existentes. Por isso, o Governo adopta uma exploração sustentável dos mesmos, e em simultâneo, um programa de investimentos em infraestruturas que permite beneficiar as gerações vindouras.⁴¹

[Perguntar: Com que intensidade acham que os recursos naturais devem ser explorados? Como podem os recursos ser divididos entre diferentes gerações de pessoas? – permitir a discussão]

Os recursos naturais podem beneficiar as famílias de diferentes formas:

³⁸ ENH (Empresa Nacional de Hidrocarbonetos): <http://www.enh.co.mz/Projectos/Projectos-em-Curso/Projecto-de-de-Pande-e-Temane>

³⁹ Constituição da República de Moçambique, artigo 109, alínea 1.

⁴⁰ Direcção Nacional de Floresta e Fauna Bravia, "Direitos das Comunidades, Realidade ou Retórica" (2003): <http://pubs.iied.org/pdfs/13518IIED.pdf>

⁴¹ MIREME site:

http://www.mireme.gov.mz/index.php?option=com_content&view=article&id=20&Itemid=153

- 1) Os recursos são uma fonte directa de subsistência para as famílias quando são usados para o consumo do dia-a-dia, para energia, para o cultivo, para venda. Por exemplo, as famílias usam madeira para cozinhar, pedra para construir as suas casas, etc.
- 2) Os recursos são uma fonte de rendimento para as famílias pois geram emprego formal. Por exemplo, será que a indústria do gás natural vai gerar mais emprego em Cabo Delgado?

De acordo com o Instituto Nacional de Petróleos, um total de 820 novos postos de trabalho serão criados com a fábrica flutuante dedicada à extração e liquefacção do gás natural,⁴² 90 por cento sendo mão de obra nacional a ser profissionalmente capacitada para o efeito. Contudo, dada a natureza do projecto é esperado que o número de postos criados seja maior no início aquando da construção de infra-estruturas como fábricas e que venha depois a diminuir quando as infra-estruturas estiverem terminadas.

Dado que as descobertas de gás feitas na Bacia do Rovuma encontram-se situadas perto de Palma, no extremo nordeste de Cabo Delgado, os maiores ganhos de emprego virão do desenvolvimento centrado nas proximidades.⁴³ Contudo, Cabo Delgado precisa urgentemente de programas de desenvolvimento, uma vez que é uma das zonas menos desenvolvidas do país.

Em 2012, foi desenvolvido um “Gas Master Plan” para o Banco de Moçambique em conjunto com o Banco Mundial. Para tal, foram desenhados diferentes cenários para a criação de emprego proveniente do gás natural encontrado no país. Esse plano prevê a criação de 14,000 a 26,000 novos postos de trabalho directos e indirectos.⁴⁴

O que diz a Lei? - Direito ao emprego

Decreto-Lei nº2/2014, artigo 18 – gás natural

- 1) Devem dar prioridade à contratação de cidadãos nacionais que possuam qualificações apropriadas em todos os níveis da sua organização, incluindo especialistas em cargos de complexidade técnica e de gestão, sem prejuízo de poderem contratar cidadãos estrangeiros nos termos deste regime laboral.
- 2) recrutamento de trabalhadores [...] deverá ser publicado em jornais de maior circulação no país através da rádio, televisão e páginas da internet.

Decreto nº 63/2011 – artigo 3

- 1) As entidades empregadoras devem empreender os melhores esforços na criação de condições para integração dos trabalhadores moçambicanos qualificados nos postos de trabalho de maior complexidade técnica e em lugares de gestão e administração da empresa.

⁴² INP, Instituto Nacional de Petróleos: <http://www.inp.gov.mz/pt/Noticias/Aprovacao-do-Plano-de-Desenvolvimento-do-Projecto-FLNG-Coral-Sul>

⁴³ INP e MIREME, Plano Director do Gas Natural (Junho, 2014): http://www.inp.gov.mz/pt/Politicar-Regime-Legal/Politicar/PLANO-DIRECTOR-DO-GAS-NATURAL_Junho2014

⁴⁴ Huerdeman Lex, Chikkatur Ananth and Crook Leonard, “Planning & Modeling under Uncertainty – Development of the Mozambique Natural Gas Master Plan”:

http://www.usaee.org/usaee2014/submissions/OnlineProceedings/Chikkatur_ASEE_OnlineProceedings.pdf

- 2) Para que existam cidadãos qualificados as empresas devem investir na formação de trabalhadores habilitados e qualificados para estas indústrias, nomeadamente na indústria do Gás Natural.

O que diz a Lei - Direito à formação

Decreto-Lei nº2/2014, artigo 19 – gás natural

- 1) As Concessionárias e as Entidade de Objectivo Específico⁴⁵ devem submeter ao Instituto Nacional do Emprego e Formação Profissional, 60 (sessenta) dias antes do fim de cada ano civil, um plano de formação para consulta e articulação devida com o Instituto Nacional de Petróleos que tenha em vista permitir um aumento gradual da percentagem de cidadãos moçambicanos a trabalhar em qualquer Empreendimento da Bacia do Rovuma em todos os níveis da sua organização.
5. Os recursos são uma fonte de riqueza para empresas, que devem investir parte dos lucros em actividades de responsabilidade social.

O que diz a Lei - Direito à Responsabilidade Social Empresarial por parte da Indústria Extractiva de Recursos Minerais

Resolução nº 21/2014 – Artigo 3

b) As actividades de exploração de recursos minerais devem ser conduzidas com base no respeito permanente pela dignidade e direitos humanos, pelo direito à estabilidade social das comunidades locais, e pelo direito ao progresso económico e social de todos os cidadãos nacionais.

Resolução nº 89/2013 – Acções de desenvolvimento social

- Estabelecer disposições vinculativas sobre a partilha dos benefícios económicos e de acesso a participação no capital de grandes projectos;
- Prosseguir com a observância de boas práticas nos processos de reassentamento, compensação pelos bens e benfeitorias e gestão doutros impactos sociais;
- Prosseguir com acções de comunicação, diálogo e consultas as comunidades para a realização e desenvolvimento das actividades mineiras e associadas;
- Promover o papel da sociedade civil, incluindo a participação dos órgãos de comunicação social, na consciencialização e melhoria do grau de conhecimento da sociedade em geral sobre a mineração, especialmente sobre os seus benefícios e impactos no desenvolvimento do país;
- Formalizar e enquadrar a “responsabilidade social empresarial”, das empresas mineiras e petrolíferas através de políticas e regulamentos específicos.

⁴⁵ Entidade de Objectivo Específico: qualquer entidade que tenha um objectivo específico, incluindo qualquer seu sucessor ou concessionário, aprovada nos termos do artigo 4 do presente decreto-lei e constituída directa ou indirectamente por qualquer uma das Concessionárias ou pelos seus sócios ou accionistas, por qualquer uma das empresas afiliadas ou por um dos seus sócios ou accionistas, para efeitos do Projecto da Bacia do Rovuma.

De acordo com a lei moçambicana, as empresas que exploram os recursos naturais devem assegurar que as comunidades locais são beneficiadas com a sua actividade. Por todo o mundo, existem empresas que investem parte das suas receitas em responsabilidade social corporativa⁴⁶, o que pode abranger as mais diversas áreas como educação e formação (educando os seus trabalhadores e formando novos técnicos em conjunto com universidades locais), saúde (investindo em infra-estruturas como hospitais e protegendo a saúde dos seus trabalhadores) ou ambiente (minimizando a poluição ambiental).

Na província de Cabo Delgado, as empresas de exploração de gás natural ANADARKO e ENI, investiram na criação de infra-estruturas: como a nova estrada asfaltada que liga Mocimboa da Praia a Palma; na expansão da corrente eléctrica em Palma e também a construção de um novo hospital na sede do Distrito⁴⁷ que já está a servir os utentes.

[Perguntar: Que responsabilidades têm as empresas em relação a comunidades como esta? De que outras formas podem as empresas trabalhar para o benefício das comunidades?]

Os recursos são também uma fonte de riqueza para o Estado que encaminha parte das receitas das indústrias extractivas para o desenvolvimento económico e social das áreas onde os recursos são explorados.

O que diz a Lei? – Investimento de parte das receitas geradas pela actividade extractiva

Lei de Minas, artigo 20

1. Uma percentagem das receitas geradas para o Estado pela extracção mineira é canalizada para o desenvolvimento das comunidades das áreas onde se localizam os respectivos empreendimentos mineiros.
2. A percentagem referida no número anterior é fixada na Lei do Orçamento do Estado, em função das receitas previstas e relativas à actividade mineira.

Lei nº 10/99 de 7 de Julho, artigo 102 – Lei da Floresta e Fauna Bravia

Um factor importante da regulação das Florestas e Fauna Bravia é de que vinte por cento de qualquer taxa de exploração florestal ou faunística, destina-se ao benefício das comunidades locais da área onde foram extraídos os recursos, nos termos do n.º 5 do artigo 35 desta lei.

Lei das Pescas, artigo 23

1. Na aplicação do modelo de gestão participativa toma-se em consideração a necessidade de assegurar:
 - a. O benefício, por parte das comunidades locais onde a pesca se desenvolve, de uma percentagem das receitas obtidas.

⁴⁶ Anglo American: <http://www.angloamerican.com/~media/Files/A/Anglo-American-PLC-V2/documents/aa-sdreport-2015.pdf>

⁴⁷ CIVILINFO:

<http://www.civilinfo.org.mz/files/Consulta%20Publica%20em%20Palma%20Agosto%202015.pdf>

Por exemplo, o Governo assegura que as comunidades locais, em especial nas zonas de exploração, sejam beneficiárias das acções relacionadas com o uso de gás natural. O Governo pretende que os mega-projectos tenham um impacto positivo nas comunidades locais e na região.⁴⁸

A exploração de gás tem planeado ter os seguintes impactos na economia local e nacional:⁴⁹

- Desenvolvimento de infraestruturas;
- Desenvolvimento de competências técnicas dos cidadãos;
- Desenvolvimento de projectos integrados, nomeadamente relacionados com a produção de combustíveis e fertilizantes, e com a geração de energia eléctrica;
- Desenvolvimento de indústrias e empresas nacionais, em particular indústrias de pequena e média dimensão, apoiado pela construção de gasodutos no país;
- Aumento da capacidade de fornecimento de energia à população;
- Geração de emprego;
- Aumento das receitas do Estado⁵⁰.

Moçambique irá receber fundos adicionais através de impostos e rendas dos projectos de gás natural, bem como uma parte do gás natural para ser usado no mercado nacional. Estes rendimentos podem ser aplicados para aumentar a industrialização e potencializar o desenvolvimento rural.⁵¹

Apesar de Moçambique ser um país rico em gás natural e outros recursos, deve ter-se atenção à situação actual da economia nacional e internacional. Desde 2014 que a economia de Moçambique tem sido significativamente afectada pela descida dos preços das matérias-primas nos mercados internacionais e à desvalorização da moeda nacional, o metical, em relação ao dólar norte-americano.⁵² De igual modo, o início deste projecto está dependente dos acordos que têm vindo a ser celebrados entre o Governo e as empresas exploradoras.

O QUE É QUE SABEMOS DE OUTROS PAÍSES QUE DESCOBRIRAM E EXPLORARAM RECURSOS NATURAIS?

O exemplo da Noruega...

⁴⁸ INP e MIREME, Plano Director do Gás Natural (Junho, 2014): http://www.inp.gov.mz/pt/Políticas-Regime-Leqal/Políticas/PLANO-DIRECTOR-DO-GAS-NATURAL_Junho2014

⁴⁹ Empresa Nacional de Hidrocarbonetos, Lda. (ENH): <http://www.enh.co.mz/Projectos/Projectos-e-m-Carteira/Projecto-de-LNG-em-Cabo-Delgado>

⁵⁰ Decreto nº 34/2015 – Novo Regulamento das Operações Petrolíferas, artigo 17: “A concessionária está sujeita ao pagamento de taxas”

⁵¹ CIP, Centro de Integridade Pública: “Gas for Development or just for money?” (2015): http://www.cip.org.mz/cipdoc/373_domestic%20gas.pdf

⁵² FMI, International Monetary Fund, Country Report No. 16/10 (Janeiro, 2016): <http://www.imf.org/external/pubs/ft/scr/2016/cr1609.pdf> (página 5)

A Noruega é um país que possui grandes reservas de petróleo e gás natural, sendo o terceiro maior exportador de gás do mundo. Este país é considerado o país mais desenvolvido do mundo, de acordo com o Índice de Desenvolvimento Humano.⁵³ Transparência, previsibilidade e uma estratégia de longo-prazo foram sempre muito importantes para que a Noruega aproveitasse da melhor maneira os recursos naturais e para que estes contribuíssem para o seu desenvolvimento.⁵⁴ A Noruega tem vindo a explorar petróleo há 40 anos, mas se continuar com o mesmo nível de exploração, as reservas chegarão ao fim daqui a 60 anos. Por isso é necessário que as receitas recebidas tenham uma boa gestão para servir as necessidades de hoje e do futuro.

Nos primeiros 20 anos após a descoberta de petróleo, as receitas provenientes do petróleo foram reinvestidas na indústria do petróleo e no desenvolvimento do país. Após esse período, ficou claro que as receitas seriam muito elevadas e criou-se o Fundo de Desenvolvimento, estabelecido na lei para apoiar o governo na gestão a longo-prazo das receitas. Este fundo guarda as receitas provenientes da exploração de recursos naturais. O fundo é detido pelos cidadãos noruegueses, e gerido pelo Banco Central da Noruega, em nome do Ministério das Finanças. A sua missão é a de guardar riqueza para as gerações futuras.⁵⁵ Do mesmo modo, os excedentes da extração de petróleo, são usados em investimento e geração de riqueza.

Assim, a Noruega assegura que mesmo quando, no futuro, as reservas acabarem, os seus cidadãos vão continuar a beneficiar das receitas do petróleo que havia sido explorado,⁵⁶ criando uma maneira sustentável e previsível de desenvolver o país. Por isso, a Noruega adopta uma estratégia de transparência em que os cidadãos, as empresas e o Estado estão informados sobre a situação da exploração dos seus recursos, bem como uma estratégia de previsibilidade pois todos sabem o que esperar hoje e no futuro.

Um exemplo mais próximo – o Botswana...

O Botswana é um país africano que descobriu reservas de diamantes em 1967. É o terceiro país com mais diamante do mundo.⁵⁷ Este país observou um grande crescimento económico desde a descoberta deste recurso, atribuído à sua boa gestão de recursos naturais, à estabilidade política e à boa governação do país.⁵⁸ A descoberta de diamantes foi importante para o crescimento do Botswana, sendo que as suas receitas representam cerca de 40% da receita do Estado.⁵⁹

Este país usou a descoberta de diamante para criar objectivos de desenvolvimento a longo-prazo. O Botswana prevê o uso das receitas para criação de infraestruturas e desenvolvimento de educação e saúde. As receitas são de facto maioritariamente direccionadas para investimentos em

⁵³ PNUD, Programa das Nações Unidas para o Desenvolvimento, “Relatório do Desenvolvimento Humano de 2015”: http://hdr.undp.org/sites/default/files/hdr15_overview_pt.pdf

⁵⁴ ITIE, Iniciativa de Transparência na Indústria Extractiva: <https://eiti.org/node/4417>

⁵⁵ ITIE, Iniciativa de Transparência na Indústria Extractiva: <https://www.nbim.no/en/>

⁵⁶ Norges Bank: <https://www.nbim.no/en/the-fund/>

⁵⁷ Statista: <https://www.statista.com/statistics/267905/world-diamond-reserves-by-country/>

⁵⁸ FMI, Botswana: 2015 Article IV Consultation – Press Release: <https://www.imf.org/external/pubs/ft/scr/2016/cr16103.pdf>

⁵⁹ Acemoglu D., Johnson S., and Robinson J., “An African Success Story: Botswana”, Cambridge, MA : Massachusetts Institute of Technology, Dept. of Economics (July, 2011): <http://economics.mit.edu/files/284>

água, transportes, educação e saúde.⁶⁰ As despesas públicas são grandemente financiadas pela riqueza gerada pelos diamantes.

Assim, o Botswana assegura que as receitas provenientes dos seus recursos minerais beneficiam o desenvolvimento da sua economia e cria uma estratégia para a melhoria das condições de vida da sua população.

Um exemplo menos bom – o que se passa na Nigéria?

A Nigéria é o maior produtor de petróleo da África Subsariana, possui cerca de 32 por cento e 34.2 por cento das reservas de petróleo e gás da África, respetivamente.⁶¹

A maior parte do petróleo e do gás da Nigéria provém de uma região chamada Niger Delta; esta região sozinha produz mais de 79% da riqueza do país. No entanto, as pessoas das comunidades locais ainda vivem em pobreza. Para além disso, a poluição e a degradação ambiental são muito altas. A exploração de petróleo resultou na degradação de terrenos agrícolas, recursos pesqueiros, e degradação do meio ambiente das comunidades. Como consequência, a região tem sido instável a nível de violência e assaltos às infraestruturas do recurso.⁶² A violência manifestada contra a exploração deste recurso tornou-se muito elevada, o que resultou na saída de algumas empresas da região.

O Governo tem feito esforços no sentido de resolver estes problemas, através da criação de programas focados em reabilitar os jovens rebeldes da região fornecendo-lhes oportunidades de receber formação profissional e de ir para o estrangeiro para terem formação. Um forte envolvimento das comunidades no envolvimento dos projectos é essencial para garantir um desenvolvimento sustentável. No entanto, a responsabilidade social corporativa implementada pelas empresas exploradoras não tem tido efeitos concretos e positivos⁶³ dada a falta de transparência e sustentabilidade dos projectos implementados.

Como consequência, a Nigéria ainda continua muito dependente da extracção de petróleo e a instabilidade deste sector afecta fortemente a economia do país.

A componente ambiental é essencial à componente de desenvolvimento social. Se o respeito ambiental não for assegurado as comunidades não podem ter desenvolvimento social sustentado. Para isso existem os regulamentos de avaliação de impacto de cada projecto, que avaliam cada projecto mesmo antes desse ser iniciado. Existem também planos de gestão ambiental que as empresas devem cumprir, e que as comunidades são um bom garante para que estes sejam implementados, o que beneficia todos os agentes.

[*Perguntar*: Porque acham que a Noruega e o Botswana conseguiram usar os recursos para melhorar as condições de vida das comunidades? O que acham que Moçambique deve aprender com estes dois exemplos? O que será que se passou na Nigéria? Que medidas podem ser

⁶⁰ De Beers group: <http://www.debeersgroup.com/en/reports/impact/country/botswana-and-cut-8/the-contribution-of-diamonds-to-Botswana-development.html>

⁶¹ Aderoju Oyefusi, "Oil and Civil Conflict in Nigeria": <https://www.csae.ox.ac.uk/workingpapers/pdfs/2007-09text.pdf>

⁶² KPMG Africa: <http://www.blog.kpmgafrica.com/wp-content/uploads/2016/10/Nigerias-oil-and-gas-Industry-brief.pdf>

⁶³ Abby Amabipi, "Understanding Host Community Distrust and Violence Against Oil Companies in Nigeria": <http://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=3094&context=dissertations>

implementadas para assegurar que a exploração de recursos naturais é feita de uma forma sustentável e benéfica para as comunidades?]

QUAIS SÃO AS LIÇÕES A GUARDAR DESTAS EXPERIÊNCIAS?

1. Cabe ao Estado criar leis e regulamentos que regulem a extração destes recursos, bem como a aplicação das receitas. E estas leis têm depois que ser cumpridas por todos os intervenientes;
2. As empresas privadas e as públicas devem cumprir as leis soberanas e colaborar com o governo;
3. Os representantes da sociedade civil devem ser ouvidos e participar activamente no processo de mediação entre os intervenientes;
4. As comunidades devem estar informadas e participarem de forma responsável nos processos de decisão e a receberem justas indemnizações.

O que diz a Lei? - Direito à informação

Lei do Ordenamento do Território (Lei nº19/2007), artigo 21:

1. Todos os cidadãos, comunidades locais e pessoas colectivas, públicas e privadas têm direito à informação completa dos conteúdos bem como das alterações dos instrumentos de ordenamento territorial;
2. direito à informação abrange todo o processo de elaboração dos instrumentos de ordenamento territorial, garantindo-se a divulgação prévia dos respectivos programas, planos e projectos.

O que diz a Lei - Direito à participação

Lei do Ordenamento do Território (Lei nº19/2007), artigo 22:

1. Todos os cidadãos, comunidades locais e pessoas colectivas, públicas e privadas, têm o direito de colaborar nas acções de ordenamento do território, participando na elaboração, execução, alteração e revisão dos instrumentos de ordenamento territorial.
2. direito de participação compreende o pedido de esclarecimento, a formulação de sugestões e a intervenção pública;

Lei de Minas, artigo 32:

1. É obrigatória a consulta prévia das comunidades antes da obtenção da autorização do início da exploração mineira.
2. Governo deve criar mecanismos de envolvimento das comunidades nos empreendimentos mineiros implantados nas suas áreas.

O que diz a Lei - Direito a uma justa indemnização

Lei do Ordenamento do Território (Lei nº19/2007), artigo 22:

1. A expropriação por interesse, necessidade, ou utilidade pública dá lugar ao pagamento de uma justa indemnização, nos termos da lei, a ser calculada de modo a compensar, entre outras:
 - a) A perda de bens tangíveis e intangíveis;
 - b) A ruptura da coesão social;
 - c) A perda de bens de produção.

Decreto nº 31/2012 – Artigo 10 (Direitos dos Afectados)

São direitos da população directamente afectada:

- a) Ter restabelecido o seu nível de renda, igual ou superior ao anterior;
- b) Ter restaurado o seu padrão de vida igual ou superior ao anterior;
- c) Ser transportado com os seus bens para o novo local de residência;
- d) Viver num espaço físico infraestruturado, com equipamentos sociais;
- e) Ter espaço para praticar as suas actividades de subsistência;
- f) Dar opinião em todo o processo de reassentamento.

Nos casos em que é necessário reassentar populações, existe na lei moçambicana Regulamentos de Reassentamento para actividades económicas. Estes regulamentos visam garantir que as populações afectadas tenham uma melhor qualidade de vida e equidade social, tendo em conta os aspectos físicos, ambientais, sociais e económicos dos quais as populações ficam sem acesso. Para isso, é necessário garantir que elas beneficiam de uma justa indemnização que tenha em conta não só o valor económico perdido, mas também a perda de acesso a uma fonte de renda ou a diminuição da qualidade ambiental.

CONCLUSÃO

Nesta capacitação aprendemos que Moçambique é um país com muitos recursos naturais e que esses recursos naturais servem para o benefício de todos os cidadãos. Os recursos naturais são uma fonte de riqueza para a economia nacional e local e por isso é importante que tenham uma boa gestão para assegurar o desenvolvimento económico e social.

Aprendemos que a descoberta de gás natural na província de Cabo Delgado foi considerada uma das maiores descobertas deste recurso dos últimos anos e que existe capacidade de Moçambique se tornar um dos importantes produtores de gás do mundo através dela. A vir se concretizar este projecto de exploração do gás natural, o impacto para a riqueza nacional será significativo uma vez que ela representará uma grande parte da futura riqueza nacional. Contudo, para que este grande investimento seja aproveitado de modo a gerar desenvolvimento local, é necessário garantir a participação das comunidades locais no processo: assegurando que elas estão informadas sobre os seus direitos e que beneficiam com parte do investimento.

O mesmo é verdade para os restantes tipos de recursos naturais mais importantes: como outros recursos minerais, as florestas e a pesca. Todos os cidadãos têm o direito de usufruir deles, seja por via de subsistência ou por via de participação nas receitas geradas pelas empresas exploradoras através do investimento em desenvolvimento local por parte destas empresas e das entidades governamentais. Deste modo, o país pode usar o sector da exploração como um instrumento para o avanço económico.

Perguntas e respostas

Conversa prática com os participantes na capacitação. Momento de perguntas e respostas.

[Muito obrigado pela vossa atenção e colaboração. Vamos agora proceder com um pequeno questionário a algumas pessoas da audiência sobre o que foi falado nesta capacitação.]

Appendix. Play Script for Community Theatre

Personagens: Pai (Abudo), Filho (Amade), Mãe (Amina)

Pai (fala para a comunidade): Bom dia/boa tarde a todos. Vamos agora apresentar uma peça de teatro que preparamos para vocês. Eu vou fazer parte de pai, Abudo. O meu colega vai fazer parte de filho, o Amade e por fim a minha outra colega será a Mãe, Amina. Fiquem atentos e espero que gostem!

ACTO I: Alpendre de uma casa normal

Pai escuta as notícias no rádio enquanto o filho brinca e mãe está a descansar. Filho pára de brincar e olha atentamente para o pai tentando ouvir o que está a ser dito. Pai fica muito interessado na notícia e assim que termina desliga o rádio.

Filho (*falando com o pai*) – Pai, o que estava a ouvir na rádio? Descobriram o quê?

Pai (*pousando o rádio*) – Gás natural! Aqui na nossa província, lá no Norte, no distrito de Palma foi descoberto gás natural.

Filho – O que é isso de gás natural? Para que serve? Posso comer?

Pai: Não sei filho, é melhor perguntares à tua mãe!

Mãe (*rindo*) – Não, não podes comer o gás! O gás é um recurso natural, está na Natureza.

Filho (*fica muito intrigado e começa a falar com a mãe*) – Recurso Natural? Mas o que é isso de Recurso Natural? A minha professora falou em recursos no outro dia mas eu não estava atento. Agora descobriram um recurso aqui perto de nós e até é notícia na rádio? Deve ser algo importante!

Mãe: Existem muito recursos naturais. Olha à tua volta – a água, a terra, a madeira das árvores (*mãe aponta para estes recursos*), todos estes são recursos que estão na Natureza que nós utilizamos no nosso dia-a-dia para as nossas necessidades.

Filho [*fica intrigado e pergunta à comunidade*]: Vocês sabiam disso? (*Ambos esperam que a comunidade responda.*) A minha mãe deve ser uma senhora muito inteligente!

Mãe: Existem recursos com muito valor: como o ouro, o rubi, o carvão ou o gás. Esses recursos também existem bem perto de nós.

Filho [*falando para a comunidade*]: Agora todos nós ficamos a saber!

Mãe: Filho, prepara-te para ir à escola! Já está na tua hora.

Filho: Está bem. Até logo pai e mãe!

Filho sai de cena e mãe começa a cozinhar. Pai fica a descansar.

ACTO II: Pátio da casa

Filho entra com a mochila da escola às costas e corre ao encontro da mãe.

Filho: Mãe! Mãe!

Mãe (*responde assustada*): O que foi filho? A galinha fugiu?

Filho: Hoje quando a escola terminou fui ter com a minha professora e ela explicou-me tudo sobre recursos naturais.

Mãe: Então diz-me o que é que a tua professora te disse.

Filho: Ela disse que existem dois tipos de recursos: os renováveis e não-renováveis? Os recursos renováveis nós podemos usar durante muito tempo porque não têm fim! Como o sol ou o vento. Esses não têm fim!

Mãe (*rindo*): Ainda bem, filho. Já imaginaste o que seria de nós se acordássemos de manhã e não houvesse sol no céu?! Mas se o sol e o vento não têm fim e por isso se chamam renováveis, então isso significa que existem recursos que têm fim!

Filho: Sim, esses são os não-renováveis porque cada vez que nós os usamos, menos fica. E por isso um dia vão acabar. Sabia que o gás, o carvão, as pedras preciosas, a madeira, e outros, todos esses acabam?

Mãe: Ai é? Nunca tinha pensado nisso! Isto quer dizer que estes recursos têm de ser retirados da natureza com regras! Todas as pessoas devem beneficiar deles, e não só! Também as gerações futuras: temos que dividir bem entre as pessoas de hoje e as de amanhã. Para os teus filhos e até os teus netos.

Filho: Sim! A minha professora na escola disse o mesmo.

Pai pega no rádio e liga-o.

Pai: Já estão a dar as notícias de hoje... Vamos ouvir!

Faz-se silêncio e os três escutam as notícias por uns momentos. No final o pai desliga o rádio.

Filho: Hoje falaram outra vez da descoberta de gás natural na nossa província. Ontem esqueci-me de perguntar à minha professora sobre isso. Mas o que é isso de gás natural? Para que serve?

Pai: Não sei meu filho, mas na rádio disseram que se descobriu muito gás. Tanto gás que pode pôr o nosso país como um dos países com mais gás no mundo inteiro.

Filho: No mundo inteiro?! Uau! Mas o mundo é tão grande! Amanhã vou falar com a minha professora sobre isso.

Mãe (fala com o pai): Agora vamos dormir. Amanhã de manhã precisamos de ir os dois para a machamba e ele para a escola.

ACTO III: Pátio da casa

Pai, filho e mãe saem de cena. Passa um dia inteiro e o filho volta e entra mas já sem mochila e senta-se no chão a fazer um desenho. Pai está sentado a descansar. Mãe entra e dirige-se ao filho.

Mãe: O que estás a fazer?

Filho: Estou a desenhar o mar. Sabia que o gás natural que foi encontrado na nossa província foi encontrado debaixo do mar?

Mãe: Do mar? Mas como é possível isso?

Filho: A minha professora disse que o gás foi encontrado debaixo do mar e que para ser transportado de lá para terra, vão ser construídas fábricas no mar e na terra.

Pai: Mas afinal perguntaste-lhe para que serve o gás natural?

Filho: Sim, ela disse é uma fonte de energia de origem natural. Serve por exemplo para electricidade, combustível, matéria-prima, para aquecimento, para produzir fertilizantes ou até

como gás de cozinha. Ela também disse que esse gás vai ser vendido no estrangeiro e no nosso país.

Mãe (pensativa): Tanta coisa! Agora entendo melhor qual é o valor do gás e sua importância para a comunidade!

Filho: Mas, afinal porque é que esta descoberta é importante para a nossa comunidade?

Pai olha para o filho e levanta-se.

Pai: Filho, quando um recurso natural é descoberto, existem leis no nosso país que regulam a sua extração. As comunidades onde os recursos são descobertos têm direito a beneficiar de uma parte das receitas do que é extraído para assegurar o desenvolvimento das populações. Isto acontece com todos os recursos – gás também. Por exemplo, construir escolas, centros de saúde, estradas...

Filho: Eu não entendo de leis... Ainda não aprendemos na escola.

Pai (*pondo a mão no ombro do filho*): Ainda precisas de crescer para aprenderes sobre leis! Um dia chegarás lá!

Depois, também as empresas que extraem os recursos naturais devem assegurar que as comunidades são envolvidas e que participam nas decisões que afectam as aldeias.

Todos em conjunto devemos assegurar que os recursos são usados para melhorar as condições de vida das pessoas.

Filho: Por isso é que os recursos naturais são tão importantes! A minha professora disse que esta descoberta de gás natural foi uma das maiores descobertas dos últimos anos e que quando o projecto começar e estiver desenvolvido, pode ter um impacto significativo na economia do país. Por isso, é importante que seja aproveitado de modo a que todos beneficiem dela e com isso gerar desenvolvimento local.

Pai: Ela está certa, filho! A tua professora está muito informada!

Filho: Acho que ela também ouve a rádio...

Os três sorriem e saem de cena.

Voltam a entrar e a fala com comunidade: Chegamos ao fim da apresentação. Obrigada pela vossa atenção. Gostaram da peça de teatro?

References

- Aker, J. C., P. Collier, and P. C. Vicente (2017). Is information power? using mobile phones and free newspapers during an election in Mozambique. *The Review of Economics and Statistics* 99(2), 185–200.
- Aragon, F. M. and J. P. Rud (2013). Natural resources and local communities: evidence from a Peruvian gold mine. *American Economic Journal: Economic Policy* 5(2), 1–25.
- Arezki, R., V. A. Ramey, and L. Sheng (2017). News shocks in open economies: Evidence from giant oil discoveries. *The Quarterly Journal of Economics* 132(1), 103–155.
- Auty, R. (1993). *Sustaining development in mineral economies: the resource curse thesis*. London: Routledge.
- Baland, J.-M. and P. Francois (2000). Rent-seeking and resource booms. *Journal of Development Economics* 61(2), 527–542.
- Brollo, F., T. Nannicini, R. Perotti, and G. Tabellini (2013). The political resource curse. *The American Economic Review* 103(5), 1759–1796.
- Caselli, F. and T. Cunningham (2009). Leader behaviour and the natural resource curse. *Oxford Economic Papers* 61(4), 628–650.
- Caselli, F. and G. Michaels (2013). Do oil windfalls improve living standards? evidence from Brazil. *American Economic Journal: Applied Economics* 5(1), 208–238.
- Casey, K., R. Glennerster, and E. Miguel (2012). Reshaping institutions: Evidence on aid impacts using a pre-analysis plan. *The Quarterly Journal of Economics* 127(4), 1755–1812.
- Collier, P. and A. Hoeffler (2004). Greed and grievance in civil war. *Oxford economic papers* 56(4), 563–595.
- Corden, W. M. and J. P. Neary (1982). Booming sector and de-industrialisation in a small open economy. *The Economic Journal* 92(368), 825–848.
- Fruhauf, A. (2014). Mozambique's lng revolution—a political risk outlook for the Rovuma LNG ventures. Working Paper 86.
- Gelb, A. H. (1988). *Oil windfalls: Blessing or curse?* New York: Oxford University Press.
- Humphreys, M., W. A. Masters, and M. E. Sandbu (2006). The role of leaders in democratic deliberations: results from a field experiment in Sao Tome and Principe. *World Politics* 58(4), 583–622.
- McKenzie, D. (2012). Beyond baseline and follow-up: The case for more t in experiments. *Journal of Development Economics* 99(2), 210–221.
- Mehlum, H., K. Moene, and R. Torvik (2006). Institutions and the resource curse. *The Economic Journal* 116(508), 1–20.
- Melina, G. and Y. Xiong (2013). Natural gas, public investment and debt sustainability in Mozambique. Working Paper No. 13/261 - International Monetary Fund.

- Robinson, J. A., R. Torvik, and T. Verdier (2006). Political foundations of the resource curse. *Journal of Development Economics* 79(2), 447–468.
- Sachs, J. D. and A. M. Warner (1999). The big push, natural resource booms and growth. *Journal of Development Economics* 59(1), 43–76.
- Toews, G., P.-L. Vezina, et al. (2016). Resource discoveries and FDI bonanzas. Technical report, Oxford Centre for the Analysis of Resource Rich Economies, University of Oxford.
- Tornell, A. and P. R. Lane (1999). The voracity effect. *American Economic Review*, 22–46.
- Torvik, R. (2002). Natural resources, rent-seeking and welfare. *Journal of Development Economics* 67(2), 455–470.
- Treisman, D. (2000). The causes of corruption: a cross-national study. *Journal of Public Economics* 76(3), 399–457.
- Vicente, P. C. (2010). Does oil corrupt? evidence from a natural experiment in west Africa. *Journal of Development Economics* 92(1), 28–38.
- World Bank (2014). How wealthy is Mozambique after the discovery of coal and gas? measuring wealth in Mozambique using the wealth accounting framework. Policy Note, Mozambique.