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To cite this article: Päivi Lujala, Christa Brunnschweiler & Ishmael Edjekumhene (2020): Transparent for Whom? Dissemination of Information on Ghana's Petroleum and Mining Revenue Management, The Journal of Development Studies, DOI: [10.1080/00220388.2020.1746276](https://doi.org/10.1080/00220388.2020.1746276)

To link to this article: <https://doi.org/10.1080/00220388.2020.1746276>



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Published online: 17 Apr 2020.



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Transparent for Whom? Dissemination of Information on Ghana's Petroleum and Mining Revenue Management

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(Original version submitted November 2018; final version accepted March 2020)

ABSTRACT Greater transparency has been proposed as an antidote to mismanagement of natural resource revenues in resource-rich, developing countries. The dominant transparency narrative in policymaking attributes a key role to the public: once citizens gain information, they are predicted to use it to demand better resource governance. Whether the public receives the available information in the first place, however, has not been scrutinised in a large-N analysis. This article examines Ghanaians' information sources and information-seeking behaviour using a unique survey with over 3500 respondents. Although Ghana has actively pursued transparency in its natural resource revenue management, most Ghanaians have poor access to understandable information as information is disseminated through channels that the intended receivers normally do not use. Non-elite citizens and those with limited English skills were least likely to have heard about natural resource revenue management, compared with elected duty bearers, traditional authorities, other opinion leaders, and those with an interest in the issue through working in mining or living near an extraction site. The results suggest that the conceptualisation of transparency may be too simplistic, and that the expectations linked to transparency in enhancing natural resource governance may not materialise through the mechanisms hypothesised in the literature.

1. Introduction

In many developing countries, revenues from high-value natural resources such as petroleum, diamonds, and certain types of timber are an integral part of the national economy (Lujala & Rustad, 2012). Despite abundant natural resources, however, these countries are often characterised by the 'resource curse': slow economic growth, weak political institutions and even violent conflict (van der Ploeg, 2011). Since the 1990s, the international community has attempted to improve natural resource governance by promoting transparency, on the assumption that the resource curse stems, at least in part, from resource revenue mismanagement (Haufler, 2010). Consequently, transparency has become a common prerequisite for obtaining investment, debt relief and loans, as well as aid from

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Supplementary Materials are available for this article which can be accessed via the online version of this journal available at <https://doi.org/10.1080/00220388.2020.1746276>.

donors, multinational financing institutions and extractive industry companies (David-Barrett & Okamura, 2016; Kasekende, Abuka, & Sarr, 2016; Shaxson, 2009; Stureson & Zobel, 2015).

In the extractive sector management literature, transparency is seen as a key to better resource governance: once citizens gain information about the management of valuable natural resources and their revenues, they will use it to form or amend their views; to debate natural resource governance-related issues; and, when desirable, as a basis for voicing concerns and requesting improved accountability in resource governance (Epremian, Lujala, & Bruch, 2016; Gillies & Heuty, 2011; Lujala & Epremian, 2017). Better governance, in turn, should increase the revenues available for public spending on education, healthcare, infrastructure and other sectors that promote economic and social development.

A better-informed public is thus central in contemporary conceptualisations of how to improve natural resource governance in poor but resource-rich countries. The empirical research on transparency in natural resource governance, however, has either focused on the information disclosure itself (that is, whether new information has been made public or not), or on whether the existence of a transparency initiative in a country correlates with the level of corruption and development. This research has thus far failed to properly scrutinise the supposed intermediary steps that link a transparency initiative – through better informed citizens and their demands for more accountability in resource governance – to the more long-term outcomes such as improved living standards (Mejía Acosta, 2013; Rustad, Le Billon, & Lujala, 2017; Sovacool & Andrews, 2015). At the basic level, we may ask: does public information on natural resource management and revenues actually reach citizens? How do citizens access this information; and who are those most likely to access the available information?

This article analyses these first steps in the transparency process and makes a unique contribution to the natural resource governance and transparency literature by providing results from a survey of over 3500 citizens conducted in 2016 in Ghana – a resource-rich, developing country actively engaged in increasing transparency in its natural resource revenue management. Ghana's 2011 Petroleum Revenue Management Act (PRMA), for example, has drawn much attention from other African countries seeking a strategy for managing their natural resources due to its strong embedded transparency measures that are often seen as model legislation when it comes to resource revenue management. Therefore, examining the extent of information diffusion, sources and uptake in Ghana may not only help in understanding whether and how transparency in natural resource governance works, but can also inform transparency initiatives in other resource-rich nations. We examine how Ghanaians access information about national and local issues in general, and how and to what extent they receive information about national and local natural resource revenue management in particular. Further, the empirical analysis assesses which factors are linked to a greater likelihood of citizens receiving information about national and local resource revenue governance.

The overall results suggest that Ghanaians have very strong feelings of entitlement when it comes to their natural resources: over 90 per cent of survey respondents completely agree with the statement that they have a right to benefit from natural resource revenues, and a similarly large share believe the government of Ghana has an obligation to publish information about revenues. Nevertheless, Ghanaians are faced with poor dissemination of understandable information. In other words, transparency exists, but only nominally, because most people are not actually receiving the available information on natural resource revenue management. Our findings show that the likely reason for this is that the main information channels used for information dissemination about natural resource governance – i.e., internet, newspapers and meetings in the regional capitals – do not reflect the most effective ways to reach people in Ghana, i.e., radio, TV and local community meetings.

Our results also show that increased information about natural resource revenues is most likely to reach those who are already in a better position in their community, and whose levels of wealth and English literacy are higher. Further, those with a more immediate interest in the extractive sector, through work in the sector or living nearby an extraction site, are also more informed about resource management. Finally, there is some evidence that people living in more remote areas may have less access to information on natural resource revenue management.

Taken together, our results suggest that it can be extremely difficult to reach citizens with this type of information. The theory of transparency in the extractive industry literature may thus be too simplistic, and the expectations linked to increased information disclosure may not materialise through the mechanisms hypothesised in the literature.

The article proceeds as follows. [Section 2](#) presents an overview of the transparency policies in Ghana's petroleum and mining revenue governance. [Section 3](#) outlines the transparency process, and [Section 4](#) provides a conceptual framework for factors that may affect the likelihood of an individual being informed about natural resource revenue management. [Section 5](#) presents the data and methods and [Section 6](#) the results. [Section 7](#) concludes with a discussion and policy implications.

2. Transparency in Ghana's petroleum and mining revenue governance

Ghana earns substantial revenues from the extractive sector: around 60 per cent of its export revenues come from gold mining and petroleum exploitation (IMF, 2017). The government of Ghana has engaged in several transparency processes within high-value natural resource management, of which the participation in the Extractive Industry Transparency Initiative (EITI) and the establishment of the independent Public Interest and Accountability Committee (PIAC, for petroleum revenues) under the PRMA are the most prominent.

Ghana joined the EITI – a worldwide initiative to increase transparency within the extractive industry – in 2003 and was validated as fully compliant in October 2010.¹ Through its annual EITI Reconciliation Reports (RRs), the Ghana EITI (GHEITI) publishes information on revenue flows originating from extractive industry companies; production volumes; leaseholders; and disbursements of revenues to sub-national units such as districts and traditional authorities.² Although the RR provides information on revenue flows going to the central government and, more recently, also sub-national transfers, it does not provide information on revenue expenditure.

By March 2020, the GHEITI had produced 20 RRs; 13 of them covering mining revenues (2004–2018), and seven oil revenues (2010–2018). The RRs are the core GHEITI output and have been described as 'solid, reliable, comprehensive and quite innovative in their contents' (Scanteam, 2016, p. 3). The RRs are usually formally launched in the national capital, Accra, at which key findings and recommendations are presented. The launch is extensively covered by both print and electronic media, and followed by radio interviews and discussions on the findings and recommendations. Limited copies of the RRs are also printed and distributed at the launch. As part of its RR dissemination strategy, the GHEITI has since 2015 organised between two and four community forums in mining districts after the launch. These are attended by opinion leaders, District Assembly (DA) members and local government, CSO, community-based group, student and local media representatives. The GHEITI community forums seek to equip communities in resource rich areas with critical information on the contracts, production and revenue contributions as well as externalities of the mining industry.

All the RRs are downloadable from the GHEITI website. In addition to the RRs, the GHEITI also publishes annual progress reports and documents and newsletters on mining and petroleum extraction related issues, which are available on its webpages.

Following the discovery of offshore petroleum reserves in 2007 and the start of production in 2010, the Government of Ghana passed the Petroleum Revenue Management Act (PRMA; henceforth termed the Act) in 2011. The Act provides the framework for collecting and allocating petroleum revenues, with the aim of ensuring responsible, transparent and accountable revenue management that benefits all citizens, including future generations (PRMA, 2011). Among other things, the Act requires the Minister of Finance to make public the records of petroleum receipts, the production volume, and oil and gas prices in the official Ghana Gazette, two national newspapers and the Ministry's own webpage on a quarterly basis, as well as to submit the information to the Parliament directly (Section 8).

Further, the Act stipulated the establishment of PIAC, which is responsible for ensuring compliance with the Act (Sections 51–57).³ PIAC is mandated to publish semi-annual and annual reports⁴ and make them accessible through two daily newspapers and its own webpage, and to present these to the President and Parliament, as well as to create space for the public to engage with the management and utilisation of petroleum revenues. PIAC's engagement with citizens is aimed at increasing knowledge and awareness of petroleum revenue management and monitoring and improving citizen's capability and willingness to hold the government accountable in managing and spending petroleum revenues. By the time of the survey, PIAC had held in total six meetings in regional capitals to engage the public.⁵ Since then, PIAC has conducted such meetings in district capitals as well.

Thus, the information about *national* resource revenue management (NRRM) is publicly available through the Internet and newspapers, and to some extent through the electronic media during and after report launch when findings and recommendations made in the reports are discussed on radio and television. Information about petroleum revenues is also directly available to the members of parliament (MP), who are expected to convey the information to the District Assembly (DA) in their local constituency, of which they are also members. In turn, the DA members, including the MPs, are expected to transmit information to the Unit Committees (UC), which constitute the lowest-level administrative units in the Ghanaian political system; to traditional authorities; and to non-elite citizens⁶ in their electoral area.

Local authorities manage revenues that originate from local mining resource extraction through various mechanisms, such as mineral royalties, concession ground rents and community development trust funds established by some mining companies (Dupuy, 2017; Kasimba & Lujala, 2018; Lawer, Lukas, & Jørgensen, 2017). Local authorities can also suggest projects to be funded by petroleum revenues through the District Medium Term Development Plans. There are, however, few formal requirements and channels to make information about the *local* resource revenue management (LRRM) public. For example, the Minerals Development Fund Act passed in 2016 does not address issues related to transparency and accountability in the management of mineral royalties transferred to paramount chiefs, traditional councils, district assemblies and local (mineral royalty) management committees (Lujala & Narh, 2019).

Despite the strong emphasis by the Government of Ghana on making national revenue-related information public, little research has so far been conducted on the actual diffusion of information on natural resource revenues. One study that focused on a rural village on Ghana's oil coast found that the inhabitants there had little access to petroleum revenue-related information, and that no one had heard about the GHEITI (Ofori & Lujala, 2015). The study also indicated that the villagers had limited access to information sources in general.

3. Information disclosure, transparency and accountability

Theories of transparency often model it as operating through causal chains where increased information disclosure catalyses a series of stages ending in improved governance, and in which each stage acts as a precondition for the following stage (Fenster, 2015; Heald, 2006a). Formulated as the transparency action cycle by Fung, Graham, and Weil (2007) and Kosack and Fung (2014), the transparency process consists of the state institutions providing salient and accessible information to citizens about their practices and policies; citizens acting on the information, seeking to influence the state; the state institutions finding the citizen action and feedback salient; and, finally, the state institutions responding constructively through changing practices and policies. The loop is finalised by the state providing updated information to the public about the changes it has made to practices and policies for further evaluation.

This transparency process may break down in any one of its phases. Most importantly for the current article, it may fail already in the first step if the information provided does not reach the intended audience, the information is not useful or the intended users simply do not care about the information. For behavioural changes to take place, citizens also must care about the policy in question, and they should be dissatisfied with the status quo. Further, citizens need to have feasible ways of acting on the information, and they need to be aware of these ways.

It is important to note that there is no one universal series of mechanisms for transparency to work, as each context requires different types of information to be disclosed, and different disclosure avenues and enabling conditions for the transparency initiative in question to be successful (Fenster, 2015; Fox, 2015; Fung et al., 2007; Heald, 2006b; Kosack & Fung, 2014). For example, limiting extractive industries' environmental or social impact requires different types of information to be disclosed than if the public were expected to demand reforms in national natural resource revenue governance. Further, while a few committed individuals may suffice to push for local changes, attempts to change national-level resource governance policies and practices likely require collective action by citizens to hold the state accountable directly (through elections or other means) or indirectly (through official oversight bodies like PIAC).⁷

For information disclosure on oil, gas and mining revenues to result in changes in how revenues are handled at the national and local level in Ghana (and elsewhere), the disclosed information needs first to reach the intended audience, the citizens. To this end, this article focuses on the first step in the transparency process: has the information provided by PIAC and the GHEITI reached the intended audience? Furthermore, to shed light on information-seeking behaviour, it examines who has been most likely to receive information about natural resource governance in Ghana. A framework for the latter point is developed in the next section.

4. Characteristics of informed citizens

The quantitative literature on information-seeking behaviour in developing countries has examined determinants linked to the likelihood of being informed about national and local issues in general, and about specific topics such as health, agriculture and disaster-related issues (Bernal & Vásquez, 2016; Sommerfeldt, 2015). Although the factors included in the analyses vary depending on the aim of the study and data limitations, most studies include variables that describe the respondent and their household, and some also include variables describing the place where the respondent lives.

In this article, we conceptualise the potential factors that may affect the likelihood of being informed along three dimensions: individual, household and geography. This is useful in order to identify and understand the potential barriers to information diffusion, as these may operate at different levels and thus may require different approaches to be overcome.

Table 1 outlines the different characteristics of each dimension that are likely to be relevant within the resource-revenue information context. *Individual characteristics* can be divided into personal and social- and role-related (Wilson, 1997). The personal characteristics include gender (women tend to be less informed on various issues than men; Bernal and Vásquez (2016); Katungi, Svetlana, and Smale (2008)); ethnicity (minority groups tend to be less informed; Bernal and Vásquez (2016)); age (information demand tends to decrease with age; Bernal and Vásquez (2016); Wang, Viswanath,

Table 1. Determinants of access to natural resource revenue information

Individual	Household	Geographic location
Personal aspects <ul style="list-style-type: none"> ● Age, gender and ethnic background ● Education ● Literacy ● Mobility Social and role related aspects <ul style="list-style-type: none"> ● Occupation ● Position in household ● Position in the community ● Political engagement 	<ul style="list-style-type: none"> ● Household size ● Living conditions ● Access to media ● Engagement in mining 	<ul style="list-style-type: none"> ● Urban vs. rural ● Remoteness ● Presence of an extractive company

Lam, Wang, and Chan (2013)); and education (less educated people tend to be less informed; Bernal and Vásquez (2016); Dutta (2009); Wang et al. (2013)). In Ghana, at the time of the survey, most information on resource revenue management was available through written sources and in English: English literacy skills are thus potentially an important determinant for information access. Finally, we expect that people who travel more often are more likely to be exposed to information that is not available in their own area.

When it comes to social and role-related variables, it is likely that respondents with their main occupation in mining have both a motive to seek and an opportunity to get more information about revenue management. Further, previous research has shown that household heads tend to have higher information levels (Bernal & Vásquez, 2016). As revenues (especially from mining) in Ghana are partially managed by local leaders – who also have a more direct link to national level administration through regular meetings with elected representatives in the DA and the national parliament – we would expect local leaders to be more informed when it comes to natural resource revenue management. We also expect that those individuals who are more politically engaged would have higher information levels.

Household characteristics that are potentially relevant in our context include household size, since more household members can mean more sources of information (Bernal & Vásquez, 2016). Poor households may have less time to seek information in general, may prioritise other types of information than those related to natural resource revenue management, or have worse access to information sources (Bernal & Vásquez, 2016; Ofori & Lujala, 2015; Wang et al., 2013). Finally, we expect that respondents from a household in which someone engages in mining are more likely to have accessed information about resource revenue management.

The final set of variables relates to the *geographical environment* of the respondent's place of residence. The existing literature has established a strong divide between urban and rural dwellers: people living in urban areas tend to be better informed and use more varied information sources than those living in rural areas (Bernal & Vásquez, 2016; Dutta, 2009; Garcia-Cosavalente, Wood, & Obregon, 2010). Further, it is possible that people living in relatively remote rural areas are less informed as the news sources may be limited (Bernal & Vásquez, 2016; Dutta, 2009; Garcia-Cosavalente et al., 2010). Finally, we expect people to be more informed in areas where an extractive company is operating.

5. Data and methods

The data used in the analysis come from a survey conducted in Ghana a between June and August 2016. The purpose of the survey was to study people's level of knowledge of and perceptions and attitudes towards a number of issues related to petroleum and mining revenue management and to understand how people inform themselves about such matters. The survey was part of a field experiment conducted in Ghana from June 2016-September 2017 that sought to evaluate the impact of PIAC's transparency and accountability efforts, targeting both leaders and non-elite citizens. The field experiment focused on the impact of PIAC, but the survey used in this article gathered information on mining and petroleum revenue governance.

The survey sample consists of 3526 adult (18 years and over) respondents, who were interviewed face-to-face by local enumerators. A combination of blocking and clustering was used in the sampling. The survey was conducted in 120 of the 216 districts in Ghana at the time (currently Ghana has 260 districts). All oil (6) and mining districts (25) were included,⁸ while the remaining 89 districts were selected randomly among leftover districts. In each district, five electoral areas were randomly selected using the Electoral Commission's list of electoral areas as the sample frame.

One DA member per electoral area was randomly selected from a list obtained from the District Assembly. The selected DA was contacted, and an appointment made to meet in their electoral area. Each DA was asked to suggest one UC member; one chief or other senior member of the traditional authorities such as a queen mother; and one other opinion leader (for example, a journalist or teacher)

in their electoral area.⁹ Lastly, two non-elite citizens (1 male and 1 female) were randomly selected in each electoral area.¹⁰ The sampling structure therefore targeted 30 respondents per selected district, with an average of 26 respondents per district included in the survey. The most difficult to reach were the traditional leaders. Due to limited involvement of women in local and national politics in Ghana, women are underrepresented among the decision makers, but they make up 50 per cent of the non-elite citizen sample.

5.1. Information sources

The first set of questions about information sources asked the respondents to rank the two most important media sources for national and local news, respectively.¹¹ The answer alternatives included radio, television, Internet (websites), social media (such as Facebook or Twitter), messages received by cell phone, newspaper, billboard or poster, information centre and information van.¹² The respondents could also indicate if they did not use any of these sources or if they used other sources than what was listed. Further, the respondents were asked to rank the two most important personal sources for national and local news. The answer alternatives included DA member, UC member, chief, another local leader, family member, friend, work colleague, other villager or neighbour and meetings organised by local leaders, community groups or other organisations. Again, the respondents could state if they did not use these as information sources and indicate other sources.

All respondents were asked whether in the past year they had received or heard any information from any source about how revenues from oil, gas or mining had been handled in Ghana (*national resource revenue management, NRRM*). Those who answered positively to this question (in total 1074, or 31%) were then asked which two media and two personal sources were their most important information sources. The answer alternatives were the same as above. The survey also asked whether the respondent had in the past year received or heard any information about how revenues from oil, gas or mining had been handled in their own area (*local resource revenue management, LRRM*). The 235 respondents (7% of the total) who had received such information were then asked to rank the two most important media and personal sources.¹³

Another set of questions regarding information sources mapped respondents' trust in the different information sources: all respondents were asked to indicate the two media and two personal sources they trusted the most and the least. Finally, respondents were asked how they would prefer to get information on petroleum and mining revenues, and what they perceived to be their best channels to contribute to natural resource revenue management.

The data on information sources is summarised and analysed by using descriptive statistics and graphs in [Section 6.1](#) below.

5.2. Determinants of informed citizens

The multivariate analysis of characteristics of citizens who received information on natural resource revenue management uses two dependent variables: NRRM and LRRM. These are coded as dummies, where a positive response takes the value of 1. Summary statistics and variable definitions for our data are provided in [Appendix 1](#).

The independent variables used in the multivariate analysis are grouped into individual, household and geographical categories (see [Table 1](#)). The individual variables include the respondent's age in years, gender, ethnicity (a dummy for those who belong to the Akan majority group), level of education (9-point scale from no schooling to completed tertiary level) and English language skills (3-point scale from being unable to read and write in English, to being able to only read, to being able to both read and write). Further, we include a dummy for household heads, for those with main occupation in mining and for those who had recently travelled to Accra. To measure respondents' general political engagement, we use a 6-point scale on how often the respondent discusses political matters and public affairs (from 'never' to 'all the time'). Finally, we include a dummy for non-elite citizens (as opposed to those with a leadership role).

The variables that describe the household include the number of adults in the household, whether a household member is involved in mining (dummy), a self-assessment of a household's living conditions (5-point Likert scale) and whether the household owns a radio (dummy) or TV (dummy). The effect of the physical environment is assessed by including a dummy if an extractive company is located in the area (self-reported), geodesic distance to regional capital (in kilometres, calculated based on the geographic coordinates of the interview location) and a dummy for urban areas.

We construct sampling weights to take into account the oversampling of DA and UC members compared to the overall population (using estimates of the number of elected representatives and 2010 census data); the undersampling of women (using 2010 census data); and the difference in ownership of radios, TVs and mobile phones – as proxies for household income – of our sample with regard to the overall population (using data from the corresponding questions in the Afrobarometer round 6, 2014).

We also consider the sampling design – the two-stage clustering and stratification in the first stage – in our analysis. In the first stage, we sampled districts and thus we use districts as our primary sample unit. The districts were drawn from three strata: oil districts, mining districts and all the other districts with stratum sizes of 6, 25 and 185, respectively. We included all oil and mining districts in the survey, the remaining primary sample units were sampled randomly within the 'no oil/no mining' stratum. We calculate the variance estimates using the three strata and the total stratum sizes with the finite population correction.¹⁴ Our survey design included second level clustering on the electoral area. As each district includes a different number of electoral areas, we adjust the variance estimates by including the total number of electoral areas with the finite population correction.

As the dependent variables are binary, we use probit regressions to analyse the determinants of informed citizens. Standard errors are estimated using Taylor linearised variance estimation. STATA 15.1 was used in all regression analyses. For anonymised replication data and replication instructions, see Lujala, Brunnschweiler, and Edjekumhene (2020).

6. Findings

6.1. Information sources

Figures 1–3 present the main results for how Ghanaians access national and local news in general and for resource revenue related issues through media (Figure 1) and personal contacts (Figure 2) and to what degree they trust these information sources (Figure 3). The results are shown separately for the non-elite citizens and the different types of local leaders. The Supplementary Appendix (SA) provides further details.

Six key points emerge from the results presented in the figures. First, it seems that the main information channels used by PIAC and the GHEITI at the time (that is, Internet, newspapers and meetings in region capitals) do not reflect what would be the most effective ways to reach people: the Internet is a major source for less than 10 per cent of the respondents; newspapers for less than 5 per cent; and equally few list public meetings as a main information source (Figures 1 and 2; SA Tables 1 and 2).¹⁵ Instead, radio in general, and TV for national issues, are the key media to reach people, and also the most trusted (Figure 3). In fact, almost 90 per cent of respondents list radio among the two most important sources, and over 70 per cent mention television when it comes to national news (Figure 1, Panel A).¹⁶ These results closely reflect the latest Afrobarometer results for Ghana that show a similarly strong importance of, and trust in, radio and TV as news sources, and a small role of newspapers (Isbell & Appiah-Nyamekye, 2018).

Second, there are few information sources for LRRM beyond radio and television, especially for non-elite citizens (Panel D, Figures 1 and 2). In fact, over 50 per cent of non-elite citizens were not able to identify one single personal source for LRRM, with the local leaders being the main personal source for the rest. Even for the local leaders themselves, TV and radio are the main media sources for LRRM – fellow local leaders being the main personal information sources. Similarly, TV and radio are the main media sources for NRRM related information (Panel C, Figure 1) for local leaders – a striking

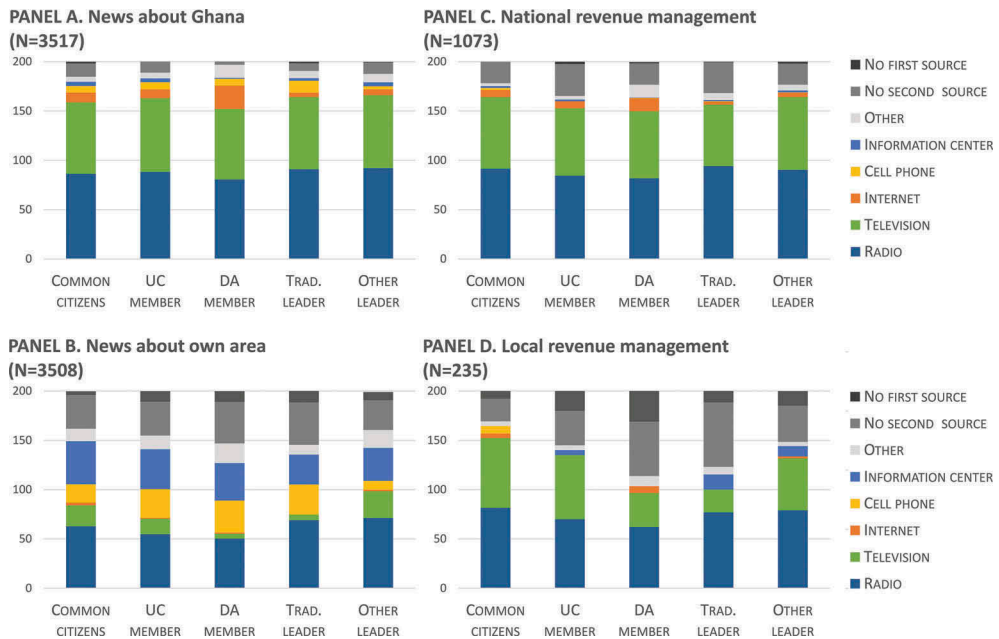


Figure 1. Main media information sources for what happens in Ghana (Panel A) and in the respondent's own area (Panel B) in general and for information about how natural resource revenues are handled in Ghana (NRRM, Panel C) and in the respondent's own area (LRRM, Panel D) in per cent.

Notes: As all respondents could list two main information sources, the per cent shares add up to 200%. UC: Unit Committee; DA: District Assembly. Original data with further breakdown can be found in Supplementary Appendix, SA Tables 1 and 2.

proportion of the respondents listing no or only one personal source for NRRM – other local leaders and family or friends being the main personal sources for information (Panel C, Figure 2).

Third, ICT technologies and social media, often promoted as convenient and cheap ways of reaching people, may be problematic, as people do not list them among the most important sources,¹⁷ and tend to distrust these sources more than others. The 2017 Afrobarometer shows that Internet and social media's importance increase with education level (Isbell & Appiah-Nyamekye, 2018), which is also reflected in our data: DA members, who are most likely to use Internet and social media (SA Table 1) as information source, are four times more likely than non-elite citizens and traditional leaders, and three times more likely than UC members and other opinion leaders, to have tertiary education.

Fourth, DA members are an important information source for other leaders (Figure 2), although less so for non-elite citizens. At the same time, however, people generally tend to trust local leaders as information sources (Panels B and D, Figure 3), a result that is in line with the 2017 Afrobarometer survey showing that most Ghanaians trust government officials (Isbell & Appiah-Nyamekye, 2018).

Fifth, young (under 30) people more often use the Internet and social media, and less often report a local leader as a main information source for both general and revenue-specific information; family and friends are considerably more important sources (SA Tables 3 and 6).

Finally, when it comes to gender, women are less likely than men to report a DA member or chief as an information source, and are more likely to rely on family and other villagers for information (SA Table 4). They are also substantially more likely to report no or only one personal information source for LRRM. Women are less likely to distrust cell phone and social media, and more likely to list family as a trusted information source (SA Table 6).

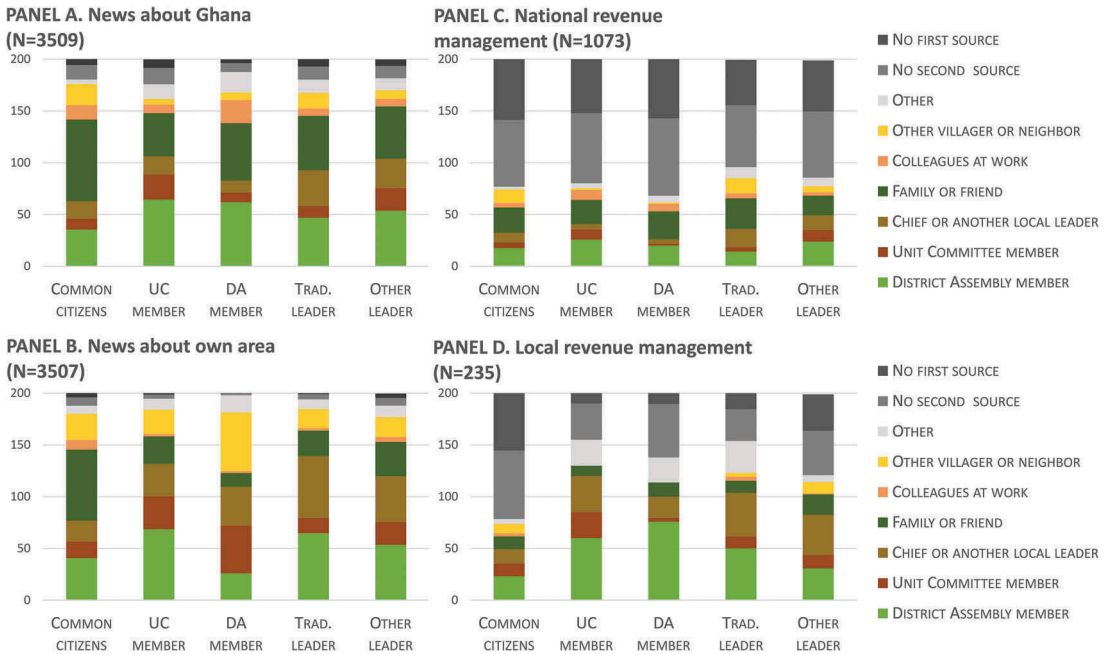


Figure 2. Main personal information sources for what happens in Ghana (Panel A) and in the respondent’s own area (Panel B) in general and for information about how natural resource revenues are handled in Ghana (NRRM, Panel C) and in the respondent’s own area (LRRM, Panel D) in per cent.

Notes: As all respondents could list two main information sources, the per cent shares add up to 200%. UC: Unit Committee; DA: District Assembly. Original data with further breakdown can be found in Supplementary Appendix, SA Tables 1 and 2.

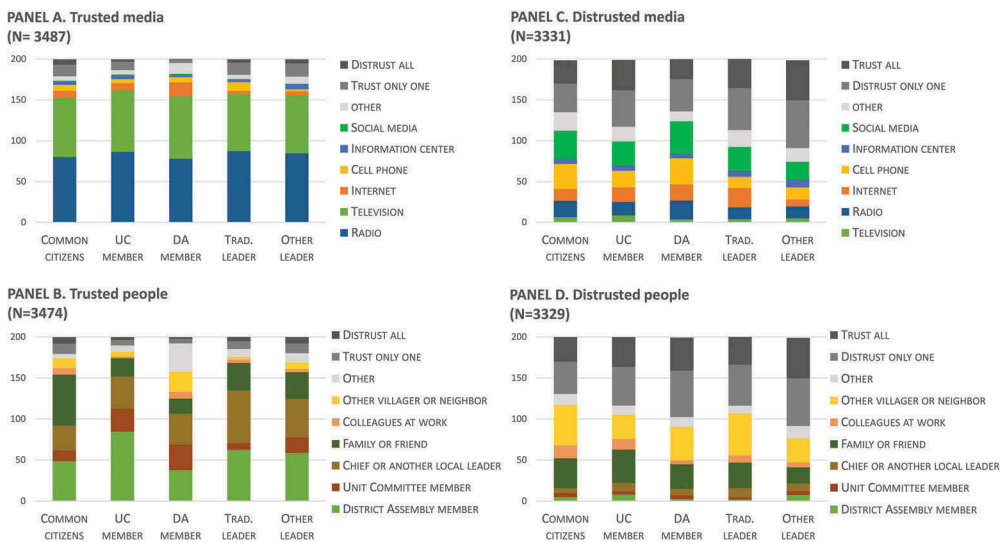


Figure 3. Most and least trusted media (Panels A and C) and personal (Panels B and D) information sources in per cent.

Notes: As all respondents could list two main information sources, the per cent shares add up to 200%. UC: Unit Committee; DA: District Assembly. Original data with further breakdown can be found in Supplementary Appendix, SA Table 5.

6.2. Informed citizens

For our outcome variables used in the multivariate analysis, the percentage of respondents who received information from any source about how revenues from oil, gas or mining had been handled in Ghana in the past 12 months (NRRM) varied from 19 per cent (non-elite citizens) to 44 per cent (DA members and traditional leaders), and from 3 per cent (UC members) to 13 per cent (other leaders) for LRRM (SA Table 7). There are also considerable geographical differences when it comes to the two dependent variables. In general, people are best informed about NRRM in Upper East (41%), Ashanti (40%) and Brong-Ahafo (34%) regions and least in Upper West (26%), Volta (24%) and Central (22%) regions. Interestingly however, in Ashanti (4%) and Brong-Ahafo (1%) people are among the least informed when it comes to LRRM, while people living in the Western (12%) and Eastern (13%) regions have the highest LRRM rates (SA Table 12 and SA Figure 1).

Table 2. Characteristics of informed citizens, national resource revenue management

	(1)	(2)	(3)	(4)
	Individual	Household	Geographic	Combined
English skills	1.193*** (4.58) 0.000			1.141*** (3.18) 0.002
Travel to Accra	1.295*** (3.46) 0.001			1.242*** (2.72) 0.007
Occupation mining	1.936** (2.04) 0.043			1.558 (1.44) 0.152
Nonelite citizen	0.676*** (-6.22) 0.000			0.675*** (-6.17) 0.000
Interest in politics	1.059*** (2.80) 0.006			1.037* (1.68) 0.096
HH living conditions		1.107*** (3.71) 0.000		1.059* (1.97) 0.052
HH TV		1.260** (2.60) 0.011		1.041 (0.40) 0.692
HH radio		1.639*** (3.79) 0.000		1.420** (2.43) 0.017
Distance to regional capital			0.998** (-2.36) 0.020	0.999 (-1.41) 0.163
Urban area			1.180*** (2.84) 0.005	1.093 (1.41) 0.161
Presence of mining company			1.405*** (4.68) 0.000	1.334*** (3.63) 0.000
Number of districts	120	120	120	120
Observations	3,462	3,478	3,425	3,384

Notes: Table shows results for probit regressions, coefficients are shown in odds ratios. Robust t-values are in parentheses and p-values are shown under t-values. Estimations use two-stage clustering (districts and electoral area). Models 1, 2 and 3 are based on preliminary estimations, which are included in Supplementary Appendix. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 3. Characteristics of informed citizens, local resource revenue management

	(1)	(2)	(3)	(4)
	Individual	Household	Geographic	Combined
Age	0.994* (-1.90)			0.994* (-1.84)
English skills	0.060 1.098* (1.83)			0.068 1.053 (1.00)
Occupation mining	0.070 2.641** (2.42)			0.320 1.634 (1.12)
Nonelite citizen	0.017 0.777*** (-2.84)			0.266 0.787** (-2.56)
HH involved in mining		0.005 1.696*** (3.92)		0.012 1.431** (2.24)
HH living conditions		0.000 1.062* (1.67)		0.027 1.033 (0.91)
HH radio		0.097 1.532* (1.96)		0.364 1.392 (1.47)
Distance to regional capital		0.052	0.998** (-2.00)	0.998 (-1.63)
Presence of mining company			0.048 1.563*** (4.50)	0.107 1.414*** (3.40)
Number of districts	120	120	120	120
Observations	3,432	3,462	3,422	3,353

Notes: Table shows results for probit regressions, coefficients are shown in odds ratios. Robust t-values are in parentheses and p-values are shown under t-values. Estimations use two-stage clustering (districts and electoral area). Models 1, 2 and 3 are based on preliminary estimations, which are included in Supplementary Appendix. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Tables 2 and 3 report the main results for regressions on who most likely receives information on NRRM and LRRM, respectively. The tables show odds ratios for probit regressions, where values larger than unity indicate an increase in the respondents' likelihood of having heard about resource revenue management, and values less than unity indicate a decreased likelihood. The odds ratio is interpreted in terms of one unit change in the independent variable. For example, the interpretation of the odds ratio of 1.19 for English literacy skills (Model 1 in Table 2) is: for a person being able to read (but not write) in English, the odds of having heard about NRRM are 1.19 times as large as the odds for a person who can neither read nor write in English.

Due to the large number of factors that potentially can affect the likelihood of having heard about natural resource revenue management, the variables were first added separately for each category of characteristics described in Section 4 and shown in Table 1 – individual, household and geographical – and the clearly insignificant variables eliminated (see SA Tables 8 and 9 for the regression results). In Tables 2 and 3, Models 1, 2 and 3 include the variables that were (nearly) significant in the preliminary estimations, and Model 4 includes all variables simultaneously. Model 4 in both tables thus presents our main findings.¹⁸

Looking at the first category of characteristics that potentially influence access to natural resource revenue information (Table 1), i.e. the individual aspects, we find that English literacy skills are positively linked to access to NRRM information.¹⁹ In addition, mobility (that is, travel to Accra during the previous 12 months) is positively related to NRRM. For LRRM, we find that older people

tend to have less often received information. The preliminary results in SA Table 8 show that although gender is negatively related to both NRRM and LRRM (i. e., females tend to have heard less often about natural resource revenue management), when only the variables for individual characteristics are included, its impact disappears when the role-related aspects are included in the estimation model as well. Ethnicity is in no estimation related to information access.

Of the social and role-related individual characteristics, being a non-elite citizen significantly reduces the likelihood of having received NRRM or LRRM related information in the past 12 months. There is some evidence that those whose main occupation is in mining are more likely to have accessed LRRM and NRRM related information, but in the main models these variables are not significant at conventional levels. Interest in political issues positively predicts the likelihood of having heard about NRRM, but is unrelated to LRRM. In neither case are the household heads more likely to be more informed than the other household members.

Of the household characteristics, better living conditions and access to media, especially radio, positively predict higher likelihood of having heard about NRRM. Respondents in households in which a member is involved in mining are more likely to have heard of LRRM. Household size is not related to access to N/LRRM related information.

Of the geographical characteristics, presence of a mining company in the area substantially increases the likelihood of having heard about NRRM and LRRM. There is some evidence that the population living in relatively remote areas are less likely to be informed about NRRM and LRRM, these being significant at p-levels of 0.16 and 0.11, respectively. Similarly, there is some evidence that people living in urban areas perhaps have better access to NRRM compared to those living in rural areas.

As a conclusion, the results suggest two main points: first, the information about N/LRRM is most likely to reach those who are already in a better position in their community. Those with better English literacy skills, living conditions and access to media are more likely to access resource revenue related information, while non-elite citizens and people living in the more remote areas have less often heard about resource revenue management. Second, people who themselves engage in mining, have a family member who engages in mining, or live in an area with a mining company are more likely to have received national and local natural resource revenue information. This implies that the information disseminated by the government can potentially be useful to people living in areas affected by mining, underscoring the importance of disseminating such information widely and effectively.

7. Discussion and conclusions

This study is the first to explore the (determinants of) information levels on natural resource management using a large-N survey in a developing country that has been actively pursuing transparency in this context for several years. The survey was conducted in June-August 2016, covered the whole of Ghana and included 3526 respondents. It delivered a snapshot of the situation in one country, so we cannot trace the evolution of information over time or make any causal inferences. Moreover, our sampling strategy was biased towards duty bearers, with non-elite citizens making up just over one-third (34%) of our sample. We do adjust our strategy by weighting to make results more representative, but we cannot capture every potential type of bias in the sample. Nevertheless, we can draw several conclusions and policy implications from the analysis.

The findings showed that the main information channels used for information dissemination about natural resource governance at the time of the survey – that is, internet, newspapers and meetings in the regional capitals – did not reflect the most effective self-reported ways to reach people, namely radio, TV and local community meetings. In general, people had few other information sources for natural resource governance beyond what they heard or saw on the radio or TV. Further, using regression analysis, we found that respondents with a better position in their community, with better English literacy skills, living conditions and access to media had more often heard about how natural

resource revenues had been managed in the previous 12-month period, while non-elite citizens tended to have heard less often about these issues. Similarly, those with a more immediate interest in the issue – respondents who either worked in mining themselves, had a household member involved in mining, or lived near a mining site – had also received more information on resource management.

Although the government of Ghana is conscious of the importance of transparency in natural resource revenue governance and actively seeks to implement transparency, one of the key audiences – the public – has so far received only limited information about natural resource revenues. There thus seems to be a gap between the currently practiced information disclosure and transparency that could activate and sustain the transparency action cycle, a result previously found in other contexts as well (Fox, 2015; Kosack & Fung, 2014). Ghanaians do care about natural resource governance; they feel entitled to benefit from them; and they are highly dissatisfied with the status quo. Many of the preconditions for the transparency process to be successful are thus in place in Ghana, but we identify three main remaining challenges to make transparency more successful – two practical and one theoretical: (1) Understanding and designing the information channel(s), (2) designing the information content, and (3) understanding the limits of the theory.

The first challenge is to reach and inform people about natural resource revenue management – in Ghana and elsewhere – as most people do not actively seek out this kind of information unless they have a personal interest (e.g. work in mining). This is in contrast to, for example, information seeking for health and education-related issues that are of more widespread immediate, personal interest. Transparency thus needs to go beyond the mere availability of information and involve more active dissemination, perhaps linked with a reminder of why every citizen should take a closer interest.

There are many likely reasons for the low levels of knowledge on natural resource revenue management in Ghana, such as people having more pressing needs to attend to (Fox, 2015; Kosack & Fung, 2014; Lieberman, Posner, & Tsai, 2014; Ofori & Lujala, 2015), but this article highlights the limited access to information sources as one of the key issues. In Ghana, PIAC and the GHEITI, the two main organisations focusing on transparency in the sector, make information available mainly in English, often in written and very technical terms; it is thus not easy for many citizens to make sense of the disclosed information. Further, PIAC and the GHEITI tend to use information channels that the intended receivers do not normally use, as shown in our survey.

Thus, as a first step in making transparency ‘work’, considerable effort is needed to make the overall issue of natural resource governance salient for a majority of citizens. A general campaign on the radio and TV – the two most-used and most-trusted sources of information – could aim at raising awareness of and stimulating interest in the issues at hand. This could also be done more indirectly, when people seek other information, for example through posters at meetings with local leaders or at local information centres.

The second step is to get relevant, more detailed and actionable information to the citizens (Fung, 2013), for which community-based channels and personal communication may be appropriate, as these have the advantage of providing interaction and immediate feedback. When asked about their views on the most effective ways for citizens to contribute to natural resource management, the respondents listed contacting district assembly members (DAs) as the most effective way for citizens to contribute to the better handling of revenues from oil, gas and mining. The link with elected DAs is not unrealistic: according to the 2017 Afrobarometer, a majority of Ghanaians (52%) think that it is their responsibility to make sure that the elected DAs do their job, a view that has gained support over the last ten years (Armah-Attah & Norviewu, 2018).

One approach could thus be to target DAs as gatekeepers for information dissemination, for example through MPs, who are part of their constituency’s District Assembly (Fiankor & Akussah, 2012). It would be important to sensitise DAs, and other local leaders, to share more information with the local people, including young people and women, who our study found are more difficult to reach through DAs. Another approach to reach the citizens more directly would be through information centres and community information meetings, two of the most preferred ways to be informed about natural resource revenues chosen by our respondents. Community meetings in particular are an

effective way of reaching people in Ghana as according to the 2017 Afrobarometer 50 per cent of Ghanaians had attended at least one community meeting during the previous 12 months, and another 35 per cent would have attended if they had had the chance (Duayeden & Armah-Attah, 2017). PIAC's decision, since our survey in summer 2016, to move their public meetings from regional to district capitals is thus a move in the right direction, as is the GHEITI's decision to disseminate the annual GHEITI report results also through community forums.

Once the most effective information channel(s) has been identified, the second challenge from the policy point of view is to streamline the actual content of the information to incentivise individuals to make use of it, particularly when they are dissatisfied with natural resource management.²¹ As in many other cases of transparency initiatives (Berliner, Bagozzi, & Palmer-Rubin, 2018), citizens in Ghana have been exposed to information that someone else has decided to be important and relevant for them. Instead, citizens should be consulted about what type of information they would like to obtain and how it should be presented. In our survey, the respondents listed information on expenditure at the national and local level, and revenue allocations to the local level, as key issues they would like to have more information about, but on which there is limited information available at the moment.

Moreover, to determine what information to provide and to direct the transparency efforts and citizen action, it is necessary to define in detail what exactly the overall objective and sub-objectives of the transparency initiative are, moving beyond having transparency as the end-goal. It is important that citizens perceive these (sub-)objectives to be relevant and within reach through actions that have been clearly spelled out, as even dissatisfied people who are interested in the information need to believe that taking action is worthwhile.

The final challenge we see is that the underlying transparency model in the extractive industry literature sees transparency as inherently 'good'. This, however, rests on the assumption that better-informed citizens would use the newly acquired information for the good of all citizens. Citizens in countries like Ghana, as shown in this article, are likely to have unequal access to information, with those already in the best position also having the best access to new information. This may simply indicate that information is reaching those who can make the best use of it, but it may also suggest that increased transparency disproportionately benefits those in more powerful positions, replicating and reinforcing any existing social or economic power imbalances (Epremian & Brun, 2018; Shaxson, 2009).

From this derives a more fundamental theoretical issue: whether the 'public' is the correct target audience for transparency initiatives (Fenster, 2015; Fox, 2015; Fung et al., 2007; Lujala & Epremian, 2017). As the results from this study indicate, the underlying assumptions of the transparency model – information provision leading to a better-informed public that will exercise its public duty to hold the leaders accountable – may be untenable, as most people do not receive the information at all. Perhaps a more cost-effective way would be to target key stakeholders, such as relevant civil society organisations, that have the required expertise to make use of the available information, and the channels, tools and resources to talk to citizens and reach decision-makers. In fact, PIAC and the GHEITI themselves, through their reports and recommendations, have already directly affected how revenues from petroleum production and mining are managed in Ghana.

In conclusion, our study shows mixed success of Ghana's transparency efforts in natural resource revenue management. However, it is worth remembering that what any one transparency initiative can achieve may be rather modest, due to limits given by its design and the wider institutional and socio-economic context in which it operates.

Acknowledgements

We are grateful to two anonymous reviewers for providing us with thoughtful comments on our article. We thank Levon Epremian, Michael Ogbe, Primi Putri and Sabrina Scherzer for insightful thoughts, discussions and suggestions on earlier versions of this article. Special thanks to Christopher

Agyekumhene, Andy Nyamekye, Charles Owusu and David Valenta for help in conducting the survey. The data and replication instructions are available through Mendeley Data (Lujala et al., 2020).

Funding

This work was supported by the Research Council of Norway under Grant 231757; International Initiative for Impact Evaluation (3ie) under Grant TW8R2.1002; and the Academy of Finland under Grants 309206 and 314143.

Disclosure Statement

Edjekumhene was a member of PIAC in 2011-2014 and consultant in charge of drafting PIAC's annual and semi-annual reports in 2013-2016.

Notes

1. For a more detailed account of how the EITI came into existence, how it functions and what its objectives are, see, for example, Haufler (2010); Kasekende et al. (2016); Lujala (2018); Rustad et al. (2017).
2. The annual EITI Report contains data on a country's extractive industries in accordance with the EITI Standard (see <https://eiti.org/document/eiti-standard-2019>).
3. PIAC consists of 13 members exclusively drawn from civil society organisations (such as organised professional bodies, think tanks, pressure groups and traditional institutions) to ensure competence and public legitimacy and to provide an active public voice.
4. By March 2020, PIAC had published 17 reports (2011–2019).
5. Attendance at these meetings was by invitation, though uninvited participants who show up were not turned away. The meetings were attended by stakeholders drawn from different government ministries, departments and agencies, civil society organisations, media and traditional authorities.
6. In this article, we use the term 'non-elite citizens' to refer to Ghanaians who do not hold any political, traditional or opinion leader position.
7. Conceptually, a push for reforms can be seen to work through horizontal (the formal checks and balances between different state institutions), vertical (citizens directly request the state to make changes) or diagonal (citizens engage directly with one state institution to influence another one) channels. See Fox (2015) on these and other conceptual frameworks for accountability.
8. The list of mining districts was obtained from the Ghana Minerals Commission.
9. In case a UC member, traditional authority or other opinion leader could not be reached, another opinion leader was added instead. The non-random selection of these duty bearers was chosen as there are no reliable lists available.
10. Two enumerators first agreed on who would interview a male and female respondent, alternating respondent gender across electoral areas. Then the two enumerators each went 100 steps in two opposite directions from the spot where they met the DA and interviewed the closest person of the selected gender willing to participate in the survey.
11. The exact questions and answer alternatives pertaining to information sources are included in Supplementary Appendix (SA Table 1–6). These tables also provide the fully disaggregated data for Figures 1–3.
12. An information centre is usually a one-room facility in a rural community providing information to the inhabitants. In most cases, the information centre is affiliated to FM radio stations broadcasting their major news bulletins. Information vans are generally owned by the Information Services Division (ISD) of the Ministry of Information. The vans move from one community to another to provide information (usually of public interest) to the citizens.
13. The rates for information on NRRM and LRRM in mining and oil districts were slightly higher at 33 per cent and 10 per cent, respectively.
14. Finite population correction accounts for the reduction in variance that occurs when sampling without replacement from a finite population.
15. Newspapers is included in the category 'other' in Figure 1. See Supplementary Appendix for more detailed breakdown.
16. The fact that radio is the preferred information source in developing countries has also been documented in other research (Msoffe & Ngulube, 2017).
17. A similar tendency has been observed in other studies (Elly & Silayo, 2013; Msoffe & Ngulube, 2017).
18. As a robustness check, we added each excluded variable into Models 4 one-by-one. None of these variables was significant, and in no model did they affect the other variables in a substantial manner. These results are reported in SA Tables 10 and 11.

19. English literacy skills trumps the effect of the education level in the NRRM estimations. If education alone is included of the two variables, it is highly significant. Education is not related to LRRM. Correlation between education level and English literacy skills is 0.74.
20. Afrobarometer 2017, discussed in Duayeden and Armah-Attoh (2017).
21. Looking at whether and what citizens do with any information on natural resource management that they receive is beyond the scope of this article. See Brunnschweiler, Lujala, and Edjekumhene (2019) for more on this point.

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References

- Armah-Attoh, D., & Norvieu, N. (2018). Demand for transparency, accountability drives call for electing local leaders in Ghana. In *Afrobarometer Policy Paper No. 48*. Retrieved from Afrobarometer website <https://www.afrobarometer.org/publications/pp48-demand-transparency-accountability-drives-call-electing-local-leaders-ghana>
- Berliner, D., Bagozzi, B. E., & Palmer-Rubin, B. (2018). What information do citizens want? Evidence from one million information requests in Mexico. *World Development*, 109, 222–235.
- Bernal, A. T., & Vásquez, W. F. (2016). Information sources and profile of informed citizens. *Information Development*, 32(3), 709–717.
- Brunnschweiler, C., Lujala, P., & Edjekumhene, I. (2019). *Does information matter? Transparency and demand for accountability in Ghana's resource revenue management* (MPRA Paper No. 92524). Retrieved from <https://mpra.ub.uni-muenchen.de/92524/>
- David-Barrett, E., & Okamura, K. (2016). Norm diffusion and reputation: The rise of the extractive industries transparency initiative. *Governance*, 29(2), 227–246.
- Duayeden, K. A., & Armah-Attoh, D. (2017). *Afrobarometer round 7, survey in Ghana, 2017. Summary of Results*. Retrieved from Ghana Center for Democratic Development (CDD-Ghana) website: http://afrobarometer.org/sites/default/files/publications/Sommaire%20des%20r%C3%A9sultats/gha_r7_sor_10042019.pdf
- Dupuy, K. E. (2017). Corruption and elite capture of mining community development funds in Ghana and SIERRA LEONE. In A. Williams, & P. Le Billion (Eds.), *Corruption, natural resources and development: From resource curse to political ecology* (pp. 69–79). Cheltenham, UK: Edward Elgar Publishing.
- Dutta, R. (2009). Information needs and information-seeking behavior in developing countries: A review of the research. *International Information and Library Review*, 41(1), 44–51.
- Elly, T., & Silayo, E. E. (2013). Agricultural information needs and sources of the rural farmers in Tanzania: A case of Iringa rural district. *Library Review*, 62(8/9), 547–566.
- Epreman, L., & Brun, C. (2018). Bringers of light: Performing resource revenue transparency in Liberia. *Geoforum*, 97 (December), 198–208.
- Epreman, L., Lujala, P., & Bruch, C. (2016). High-value natural resources and transparency: Accounting for revenues and governance. *Oxford Research Encyclopedia of Politics*. doi:10.1093/acrefore/9780190228637.013.21
- Fenster, M. (2015). Transparency in search of a theory. *European Journal of Social Theory*, 18(2), 150–167.
- Fiankor, D. K., & Akussah, H. (2012). Information use and policy decision making by district assembly members in Ghana. *Information Development*, 28(1), 32–42.
- Fox, J. (2015). Social accountability: What does the evidence really say? *World Development*, 72(August), 346–361.
- Fung, A. (2013). Infotopia: Unleashing the democratic power of transparency. *Politics & Society*, 41(2), 183–212.
- Fung, A., Graham, M., & Weil, D. (2007). *Full disclosure: The perils and promise of transparency*. Cambridge: Cambridge University Press.
- García-Cosavalente, H. P., Wood, L. E., & Obregon, R. (2010). Health information seeking behavior among rural and urban Peruvians: Variations in information resource access and preferences. *Information Development*, 26(1), 37–45.
- Gillies, A., & Heuty, A. (2011). Does transparency work? The challenges of measurement and effectiveness in resource-rich countries. *Yale Journal of International Affairs*, 6(6), 25–42.
- Haufler, V. (2010). Disclosure as governance: The extractive industries transparency initiative and resource management in the developing world. *Global Environmental Politics*, 10(3), 53–73.
- Heald, D. (2006a). *Transparency as an Instrumental Value*. (C. Hood & D. Heald, eds.). Oxford: Oxford University Press.
- Heald, D. (2006b). *Varieties of Transparency*. (C. Hood & D. Heald, eds.). Oxford: Oxford University Press.

- IMF. (2017). Ghana: 2017 article IV consultation, fourth review under the extended credit facility arrangement. I. M. F. A. Department (Ed.), *Country Report No. 17/262* Retrieved from. <http://www.imf.org/en/Publications/CR/Issues/2017/09/06/Ghana-2017-Article-IV-Consultation-Fourth-Review-Under-the-Extended-Credit-Facility-45224>
- Isbell, T., & Appiah-Nyamekye, J. (2018). Ghanaians rely on radio and TV, but support for media freedom drops sharply. *Afrobarometer Dispatch No. 250*. Retrieved from http://afrobarometer.org/sites/default/files/publications/Dispatches/ab_r7_dispatch250_news_and_media_in_ghana.pdf
- Kasekende, E., Abuka, C., & Sarr, M. (2016). Extractive Industries and corruption: Investigating the effectiveness of EITI as scrutiny mechanism. *Resource Policy*, 48(2), 117–128.
- Kasimba, S., & Lujala, P. (2018). There is no one amongst us with them! Transparency and participation in local natural resource revenue management. *Extractive Industries and Society*, 6(1), 198–205.
- Katungi, E., Svetlana, E., & Smale, M. (2008). Gender, social capital and information exchange in rural Uganda. *Journal of International Development*, 20(1), 35–53.
- Kosack, S., & Fung, A. (2014). Does transparency improve governance? *Annual Review of Political Science*, 17(1), 65–87.
- Lawer, E. T., Lukas, M. C., & Jørgensen, S. H. (2017). The neglected role of local institutions in the ‘resource curse’ debate. Limestone mining in the Krobo region of Ghana. *Resources Policy*, 54(December), 43–52.
- Lieberman, E. S., Posner, D. N., & Tsai, L. L. (2014). Does information lead to more active citizenship? Evidence from an education intervention in rural Kenya. *World Development*, 60(August), 69–83.
- Lujala, P. (2018). An analysis of the extractive industries transparency initiative implementation process. *World Development*, 107(July), 358–381.
- Lujala, P., Brunnschweiler, C., & Edjekumhene, I. (2020). Replication data and instructions: Transparent for whom? Dissemination of information on Ghana’s petroleum and mining revenue management. *Mendeley Data*. <http://dx.doi.org/10.17632/z4prjgij96.1>
- Lujala, P., & Epremian, L. (2017). Transparency and natural resource revenue management: Empowering the public with information? In A. Williams & P. Le Billon (Eds.), *Corruption, natural resources and development* (pp. 58–68). Cheltenham, UK: Edward Elgar Publishing.
- Lujala, P., & Narh, J. (2019). Ghana’s minerals development fund act: Addressing the needs of mining communities. *Journal of Energy & Natural Resources Law*. doi:10.1080/02646811.2019.1686250
- Lujala, P., & Rustad, S. A. (2012). High-Value natural resources: A blessing or a curse for peace? In P. Lujala & S. A. Rustad (Eds.), *High-Value Natural Resources and Post-Conflict Peacebuilding* (pp. 3–18). New York: Routledge
- Mejía Acosta, A. (2013). The impact and effectiveness of accountability and transparency initiatives: The governance of natural resources. *Development Policy Review*, 31, 89–105.
- Msoffe, G. E. P., & Ngulube, P. (2017). Information sources preference of poultry farmers in selected rural areas of Tanzania. *Journal of Librarianship and Information Science*, 49(1), 82–90.
- Ofori, J. J. Y., & Lujala, P. (2015). Illusory transparency? Oil revenues, information disclosure, and transparency. *Society & Natural Resources*, 28(11), 1187–1202.
- PRMA. (2011). *Petroleum revenue management act (Act 815)*. Retrieved from <https://www.mofep.gov.gh/sites/default/files/acts/Petroleum-Revenue-Management-ACT-815.pdf>
- Rustad, S. A., Le Billon, P., & Lujala, P. (2017). Has the extractive industries transparency initiative been a success? Identifying and evaluating EITI goals. *Resources Policy*, 51(1), 151–162.
- Scanteam. (2016). *Ghana extractive industries transparency initiative in Ghana (GHEITI): Ten years of achievements: 2004-2013*. Retrieved from https://www.gheiti.gov.gh/site/index.php?option=com_phocadownload&view=category&id=15:implementation-reports&Itemid=54
- Shaxson, N. (2009). *Nigeria’s extractive industries transparency initiative: Just a glorious audit?* Retrieved from Chatham House website <https://www.chathamhouse.org/publications/papers/view/109174>
- Sommerfeldt, E. J. (2015). Disasters and information source repertoires: Information seeking and information sufficiency in postearthquake Haiti. *Journal of Applied Communication Research*, 43(1), 1–22.
- Sovacool, B. K., & Andrews, N. (2015). Does transparency matter? Evaluating the governance impacts of the extractive industries transparency initiative (EITI) in Azerbaijan and Liberia. *Resources Policy*, 45(3), 183–192.
- Sturesson, A., & Zobel, T. (2015). The extractive industries transparency initiative (EITI) in Uganda: Who will take the lead when the government falters? *The Extractive Industries and Society*, 2(1), 33–45.
- van der Ploeg, F. (2011). Natural resources: Curse or blessing? *Journal of Economic Literature*, 49(2), 366–420.
- Wang, M. P., Viswanath, K., Lam, T. H., Wang, X., & Chan, S. S. (2013). Social determinants of health information seeking among Chinese adults in Hong Kong. *PloS One*, 8(8), e73049.
- Wilson, T. D. (1997). Information behaviour: An interdisciplinary perspective. *Information Processing & Management*, 33(4), 551–572.

Appendix 1. Summary statistics and variable definitions

Variable	Obs	Mean	Min	Max	Definition
National revenue management (NRRM)	3492	0.31	0	1	Dummy: 1 if respondent had in the past year received or heard any information from any source about how revenues from oil, gas or mining had been handled in Ghana
Local revenue management (LRRM)	3487	0.07	0	1	Dummy: 1 if respondent had in the past year received or heard any information from any source about how revenues from oil, gas or mining had been handled in own area
Age	3466	46	18	110	Age in years
Gender	3518	0.22	0	1	Dummy: 1 if respondent is female
Ethnic majority	3526	0.58	0	1	Dummy: 1 if respondent is Akan
Education	3513	4.57	0	8	Scale from 0 to 8. 0: None (13%); 1: Incomplete primary school (4%); 2: Completed primary school (2%); 3: Incomplete junior high school (5%); 4: Complete junior (32%); 5: Incomplete secondary/technical school (2%); 6: Completed secondary/technical school (18%); 7: Incomplete tertiary (2%); 8: Completed tertiary (22%)
Travel to Accra	3515	0.72	0	1	Dummy: 1 if respondent has travelled to Accra during the past six months
English skills	3513	1.48	0	2	Scale from 0 to 2. 0: Cannot read or write English; 1: Can read English; 2: Can read and write English
Household head	3526	0.71	0	1	Dummy: 1 if respondent is household head
Occupation mining	3526	0.01	0	1	Dummy: 1 if respondent's main occupation is mining
Common citizen	3526	0.34	0	1	Dummy: 1 if respondent does not have any leader position
DA	3526	0.16	0	1	Dummy: 1 if respondent is District Assembly member
UC	3526	0.17	0	1	Dummy: 1 if respondent is Unit Committee member
Chief	3526	0.11	0	1	Dummy: 1 if respondent is traditional leader
Opinion leader	3526	0.22	0	1	Dummy: 1 if respondent is opinion leader (teacher, religious leader, youth leader etc.)
Interest in politics	3495	2.39	0	5	How often the respondent discusses political matters and public affairs with friends, family or colleagues? 6-point scale: Never, Rarely, Sometimes, Often, Very often, All the time
HH size	3469	4.91	0	30	Number of adults living permanently in the household
HH involved in mining	3507	0.06	0	1	Dummy: 1 if someone in the household currently engages in mining
HH living conditions	3505	1.99	0	4	Respondent's self-assessment of households' present living conditions. 5-point Likert scale from very bad to very good
HH TV	3517	0.85	0	1	Dummy: 1 if household owns TV
HH radio	3516	0.93	0	1	Dummy: 1 if household owns radio
Presence of mining company	3469	0.18	0	1	Dummy: 1 if respondent indicates that a mining or oil company operate in or nearby area
Distance to regional capital	3499	56	1	166	Dummy: Distance in kilometers to the closest regional capital. Measured as direct line (geodesic) from the interview spot (latitude and longitude coordinates).
Urban area	3526	0.46	0	1	Dummy: 1 if the district is considered as urban area