



Underutilization of Agricultural and Mineral Resources in Africa, the Case of DRC

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How to cite this paper: Lipekene, P., He, P.M. and Diawara, F. (2023) Underutilization of Agricultural and Mineral Resources in Africa, the Case of DRC. *Open Access Library Journal*, **10**: e10897.

<https://doi.org/10.4236/oalib.1110897>

Received: October 19, 2023

Accepted: November 27, 2023

Published: November 30, 2023

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Abstract

Agriculture plays a prominent role in the economy of the Democratic Republic of Congo (DRC) and has considerable production potential. Sub-Saharan African countries are known to be bedeviled with some challenges hindering the economic development. Meanwhile, some of these issues have not been exhaustively investigated in the context of the region. Thus, this study aimed at investigating the underutilization of agricultural and mineral resources in Africa, the case of D. R. Congo. Yearly data, spanning from 2007 to 2020, was converted from low frequency (yearly) to high frequency (quarterly) and utilized. This study developed a questionnaire to evaluate the household identity, source of income, access to land, crops grown on the land, farming and animal husbandry practices, and constraints faced by households in relation to agriculture. The survey included meetings with farm heads, data collection from 120 households on household characteristics of their livelihoods (human capital, land capital, social capital, financial, etc.), as well as an overview of living conditions and income from agricultural activities. The data were processed and analyzed using R 3.6.2 and Excel software. The results showed that access to land is problematic with relatively small farms, especially when one considers that household size is high and therefore, the “area per farm” ratio is low. Moreover, agriculture generates very little income and it is therefore very difficult for a farmer to emerge from poverty. As a result, implementing an effective and equitable anti-poverty policy in rural areas is important to address the issue of farming household incomes and target low incomes from all sources of income.

Subject Areas

Agricultural Engineering, Agricultural Science

Keywords

Underutilization, Agricultural, Mineral Resource, Conflict, D. R. Congo

1. Introduction

The Democratic Republic of the Congo (DRC) is emerging from a bloody war that has claimed the lives of nearly 4 million people, the majority of them in the eastern part of the country. In the absence of a strong state, the raging civil wars allowed the rebels, neighboring countries (Burundi, Rwanda, and Uganda), and international players to plunder the country's unparalleled endowment of valuable minerals, wildlife, and timber. In its investigations, the United Nations (2023) [1] found that the violence in the DRC was largely supported by the funds the players gained by looting and exploiting natural resources, mostly minerals in areas under their control confiscation and extraction of resources made the war, the expert panel reported, "a very lucrative business" (p. 6). Despite this great natural resource wealth, the people of the DRC suffer great poverty: More than 75 percent live on less than a dollar a day and lack access to drinking water, and the infant mortality rate is one of the highest in the world (OECD & ABD, 2021) [2]. In this article, I propose two intertwined frameworks that help explain the paradox of a rich country with poor people. One, throughout its history, different natural resources in the DRC have been deemed "strategic" by the international markets. Two, Congolese institutions have been unable to protect the country's resources due to corruption, weak governance, and low capacity. Thus, natural resources are vulnerable to exploitation and violent competition when they are found in abundance in a particular location.

Some conflicts cannot be fully explained or properly addressed if environmental factors especially those related to access and control of some strategic natural resources are not integrated in the overall causal analysis. Failure to integrate these crucial dimensions leads to incomplete conflict resolution; patterns of violence are then more likely to return after peace accords have been implemented.

The current fragile peace, 2018 presidential and parliamentary elections, and subsequent 2019 local elections have paved the way for a new governance system in this war-torn country. But peace will not be sustainable without reconstructing the systems that govern the country's natural resources. Efforts by the World Bank and the U.S. Agency for International Development (USAID) to establish codes of conduct for forest management and mining are steps in the right direction but much work remains to be done. In this paper, the underutilization of Agricultural and mineral resources in Africa was studied.

2. Armed Conflict and the Role of Natural Resources

There is a large body of quantitative research on the external factors relevant for understanding civil conflicts at the local, national, and international level (Paul & Anke, 2022) [3]. Examples of these external factors include resources type and the characteristics of the state. These studies have focused on the access to and use of natural resources by conflict parties, especially the role of conflict financing through the exploitation of natural resources (de Sosya, 2022) [4]. Valuable

natural resources like diamonds, gold, oil, timber, and even drug crops and medicinal plants, have been found to be prone to misappropriation. The control of these resources may allow rebels to generate conflict financing (Nicholas & Elbadawi, 2022) [5].

Along similar lines, several quantitative political science studies demonstrated that the abundance of natural resources increases the statistical risk of armed conflict at the national level. However, numerous other studies have criticized the robustness of such conclusions (James, 2021) [6]. This criticism reflects flaws such as the methodology of the quantitative studies, which fail to distinguish civil war onset and ongoing civil war as equal components of civil war prevalence. Despite this flaw, these studies can nonetheless be useful in understanding how conflict makes the management of natural resources more difficult and vice versa.

Another set of academic studies focuses on environmental scarcity and competition between groups for these natural resources. Increasing demand from growing populations and inequalities in the distribution of natural resources can ultimately lead to environmental degradation. These studies have also been criticized for methodological weaknesses, paucity of data, and according too much weight to environmental factors and too little emphasis on human factors such as technological innovativeness and ingenuity (Nils *et al.*, 2022) [7]. Nevertheless, the concept of competition between groups over distribution of resources is pertinent to an understanding of the current, and sometimes violent, community-level conflicts over land and forest usage in the eastern provinces of the DRC.

The DRC includes most of the Congo Basin region, an area of enormous wealth in terms of biodiversity, timber, and mineral resources. Despite this natural wealth, however, the DRC is one of the poorest countries in the world with significant infrastructure deficiencies and an economy that is highly dependent upon agriculture and forestry. Violent and nonviolent conflicts linked to the use of its natural resources have historically prevented the DRC from fully utilizing its resources to generate revenue and improve quality of life for its citizens.

Specifically, numerous policy reports have highlighted the role of minerals in financing the armed groups involved in the most recent DRC conflicts (United Nations, 2023) [1]. Control over mining areas in the eastern provinces continues to shift between different independent armed groups and units of the Military of the Democratic Republic of the Congo (“FARDC”). The struggle for control over these resources has exacerbated conflict and created greater difficulty in managing the resources to benefit the public.

Despite a recent transition towards peace, conflict and insecurity remain in the eastern provinces of North and South Kivu, Orientale, Maniema, and Katanga (De Soysa, 2022) [4]. These conflicts are particularly acute in the northeastern provinces of Ituri in Orientale, and North and South Kivu, where local militia and foreign rebel forces continue to terrorize the regions. A prime example of conflict is the Virunga National Park (“Park”) located in northeastern DRC, on the border with Uganda and Rwanda (José, 2021) [8]. The Park was the

site of some of the large-scale armed conflicts that occurred in the Kivu Provinces. The 1994 Rwandan genocide and resulting refugee crisis led to the presence of about 700,000 refugees on the edges of the Park. These displaced groups increased the consumption of resources both inside and outside the Park, furthering the impact on the environment and leading to mass deforestation.

Identity and nationality, which are linked to land and political power, have also played an important part in the different conflicts of the DRC. In the absence of alternative income earning opportunities in the formal economy or in commerce, access to land is essential to livelihoods in DRC. There have been several historic conflicts over grazing land and land ownership between Hema and Lendu peoples in Ituri (René, 2021) [9]. These conflicts have killed 10,000 and displaced 50000.33. Moreover, these types of conflicts are likely to continue until those natural resources with income-generating potential, such as timber, are better managed.

Since 1996 the Democratic Republic of the Congo (DRC) has experienced a succession of wars and lower scale conflicts that according to a survey of the International Rescue Committee have been the cause of more than five million deaths over the 1998-2008 period (IRC, 2022) [10] and an estimated 1:7 million internally displaced people (Internal Displacement Monitoring Center, 2021) [11]. Whether or not these exact figures are biased (Spiegel & Robinson, 2020) [12], their magnitude is indicative of the lethality of these conflicts and of the disruptive impact they had on local living conditions (Pellillo, 2022) [13]. The causes of the Congo Wars are multiple, complex, and intermingled: the weakness and inefficiency of Mobutu's regime, ethnic polarization, spillover effects from the Rwandan genocide, regional control by foreign powers and natural wealth have all been listed among the key factors (Vlassenroot & Raeymaekers, 2022) [14].

Congo's natural wealth in mineral resources has been consistently blamed as the main driver of the violence, either as a way to finance warring parties or as a warfare objective in itself (Congdon Fors and Olsson, 2022) [15]. Although Autesserre (2022) [16] warns about the dangers of focusing exclusively on the role of mineral exploitation as a cause of violence in the country, it is hardly deniable that many Congolese mining locations have been looted and the minerals exported illegally over the years by both Congolese and foreign armed groups (Congdon Fors and Olsson, 2022) [15].

The anecdotal evidence is extensive. Over the years the United Nations has repeatedly issued reports of experts, of the UN Security Council, and of the UN Secretary General underlining that natural resources have shaped and fueled the conflicts in DRC. There is evidence that both foreign and Congolese armies were directly involved in large-scale looting of mineral resources: regular soldiers were reported to force the mines' managers to "open the coffers and doors. The soldiers were then ordered to remove the relevant products and load them into vehicles" (Stearns, 2021) [17]. Valuable minerals are reported to have motivated

the military intervention of neighboring countries such as Burundi, Rwanda and Uganda, especially after the end of the first Congolese War. Stearns (2021) [17] reporting the interview of a pilot highly involved in military and mineral transportation during the Congolese wars observes how: “Rwanda’s shifting priorities [between the security imperative during the first Congolese war and the business objectives during the second] became clear to Pierre [a pilot interviewed] in his flights. He flew their troops into mining areas, where Rwandan commanders would be in charge of loading tons of tin and coltan [a high value mineral used in the manufacturing of electronic devices] into airplanes”.

3. Natural Resource Management and Governance Challenges

The twin challenges of governance for the DRC are to provide security for all of its citizens and to build democratic, transparent, and accountable institutions capable of managing its enormous resource wealth for the benefit of its entire population (USAID, 2021) [18]. The Inter-Congolese Dialogue ended with the signing on April 20, 2002 of the Sun City Agreement. The agreement included political power-sharing in Kinshasa, but fatally allowed each former rebel leader to retain parallel control of his men as they were merged into the national army. The unfortunate result was that between 2002 and 2006, the DRC was regularly shaken by clashes between different components of the “national” army, including soldiers supported by Uganda, Rwanda, and Zimbabwe. The UN peacekeeping mission (MONUC) could not control the clashes, so the DRC’s international partners decided to create the EU Mission on Security Sector Reform in Congo (EUSEC), through which a team of experts in disarmament, demobilization, and reintegration was sent to help reform the Congolese army.

French General Pierre-Marie Joana, who commanded EUSEC from 2005 to 2008, explained during a later speech in Paris why his mission had been an impossible one: “The DRC does not only have to (...) settle ten years of crisis and war (...) It must also settle thirty years of Mobutism which never succeeded (...) in giving the State control of coercion (...)” 10 After three years of work with national and international stakeholders, General Joana identified a number of obstacles to security sector reform in the DRC:

- While the army was supposed to be a “national” army, it was actually composed of disparate troops from several politico-military movements, each having different motivations and answering to a separate, parallel command.
- No one knew the exact location or armaments of these troops, which were estimated to number more than 340,000 men and women.
- The first group of the “national” army was made up of the former FAZ. Since the beginning of the DRC’s crisis in 1990, this force had ceased regular training and recruiting and, as a result, included elderly, chronically ill, wounded, and disabled soldiers.
- A second group was the “kadogo” child soldiers, who were recruited by force

during the 1996 war and comprised the majority of President Kabila's army.

- A third group was made up of ex-rebels from the Congolese Rally for Democracy (RCD). This group was split into three separate movements (RCD-Goma, RCD-Kisangani, and RCD-National). Another rebel group in the "national" army was the Liberation Movement of the Congo (MLC).
- A fourth group was composed of numerous ex-Mayi-Mayi local militias. Their original objective was to protect their villages against invading Rwandan and Ugandan forces. Many of them had no desire to be part of a national army.
- The last group in the DRC's new "national" army was made up of Rwandan and Ugandan soldiers who were part of rebel movements and did not return to their home countries when, in 2002, the Rwandan Defense Forces (RDF) and the Uganda Patriotic Defense Forces (UPDF) withdrew from the DRC.

Third-party surveys would suggest weak governance and high corruption in the DRC (Collier *et al.*, 2022) [19]. Indicators from various sources (for example, the Worldwide Governance Indicators, the Ibrahim Index of African Governance, the World Bank's Country Policy and Institutional Assessment Indicators, and Transparency International's Corruption Perception Index) show that the DRC typically scores well below the regional average (United Nations Security Council, 2020) [20]. However, the DRC's scores appear in a better light when compared, perhaps more appropriately, to a narrower set of more similar peers: fragile states and nonoil, resource-rich, low-income countries in sub-Saharan Africa (OECD, 2021) [2]. This is pertinent since political fragility and natural resource endowments often appear to be entangled with weak governance and corruption. Centralized corruption in the DRC is well documented, and survey data also suggest a worsening of decentralized corruption in recent years, up to 2018. Transparency International's Corruption Barometer looks more closely at the broader public's perception and experience of corruption, making it more suited to assessing decentralized bureaucratic corruption (OECD, 2021) [2]. The DRC stands out in that public perceptions of corruption are both high and have continued to increase over time: 80 percent of respondents in 2013 considered corruption a serious problem, and 66 percent thought it had increased in the preceding three years both higher than the regional average. The 2019 Barometer survey reported that DRC saw an 85 percent increase in perceptions of corruption in the previous 12 months to early 2018 the highest in the region (Staines & Nicholas, 2022) [21]. The public sector is viewed as being notably more corrupt than the private sector, largely in the delivery of services, and the incidence of bribery in public institutions exceeded regional rates the provision of medical services being one significant exception. There was also broad skepticism about the government's effectiveness in tackling corruption and the ability of the public to make a difference. Business surveys support the conclusion that decentralized corruption is an issue. The 2006 and 2013 World Bank Enterprise Surveys look at corruption from the business perspective from

2006 to 2013 the latest available survey (United Nations, 2023) [1]. Over this period, the proportion of businesses that identified corruption as a major concern rose from 20 to 58 percent, and those that saw it as the primary obstacle to business activity went from 1 percent to 12 percent. Similarly, the latest World Economic Forum Executive Opinion Survey available for the DRC (2017) found that 14 percent of firms viewed corruption as the primary obstacle. According to the World Bank survey, about half or more of businesses reported receiving a bribery request or having to pay a bribe to obtain a government contract, an import license, a construction permit, a water or electricity connection, or generally to get things done. These rates were again substantially higher than the regional average.

Although the existing legal framework recognizes the right to use land via customary law, it also allows for land grabbing, the purchase of occupied land, and the eviction of tenants. And since the government retains the right to define “Congolese people,” the issue of who is entitled to land rights is highly politicized. Further tensions stem from the unclear role of formal and customary authorities. Thus legal reform is necessary to prevent future land-grabbing opportunities that could cause armed conflict. Legitimizing certain existing formal and customary systems of land administration, and providing a forum for land use disputes, could help diffuse both future conflicts and lay a framework for sustainable land management (World Bank Institute, 2021) [22]. The demarcation of conservation areas in the DRC is also a contentious political issue. The existence of conservation areas has been linked to colonial land demarcations, which are not always understood or accepted by the communities affected.

In response, managers of these protected areas have engaged in participatory management methods involving local communities, such as consultations, participatory demarcation, and the creation of alternative livelihood activities (Graeme *et al.*, 2020) [23].

However, conflict exists not only over the natural resources but also over collaboration: site-specific, cross-border collaboration efforts between conservation organizations in Rwanda, DRC, and Uganda have continued during various wars at the regional level. Furthermore, the DRC continues to face significant challenges in its reform processes in all natural resources sectors. The widespread disintegration of government functionality during the prolonged conflicts has left a legacy of bureaucratic inefficiencies in knowledge, expertise, capacity, and resourcing across all sectors (USAID, 2021) [18]. These shortcomings mean that institutions often are unable to respond to the serious problems they face. For instance, in the area of education, only thirty-two percent of teachers in secondary school and twenty percent of those in higher education are qualified at the level mandated by their posts. Congo’s National Statistical Institute (“INS”) lacks resources to collect the necessary information by which ministries’ performance can be verified. Even in areas where periodic reporting is mandatory, such as the mining industry, it is still difficult to find reliable data on mining operators,

production, or exported commodities.

Transparency in governance remains another main challenge to effective natural resources in the DRC. The country now ranks 164th out of 178 in the 2011 Transparency International Corruption Perception Index, while the World Bank/IFC Doing Business 2011 survey ranks DRC 175th out of 183 countries. A number of authors have highlighted the negative effects of corruption on the management of natural resources in DRC (Open Society Initiative for Southern Africa, 2022) [24].

For instance, policy processes are prone to disruption by politicians acting in their own, rent seeking interests. Furthermore, government agents at mine sites illegally tax the operations in eastern DRC, justifying their practice by blaming the lack of monetary support from the central government.

4. The Need for Capacity Building in the DRC

The concept of “capacity” refers to the ability of individuals and institutions to conceive and carry out decisions effectively and efficiently. There is a clear need for institutional capacity building in the DRC to ensure compliance with the international norms and agreements relevant to environmental management (World Bank Institute, 2021) [22]. At the individual level, capacity building refers to the processes of teaching and skills training. At the local and national institutional level, improvements to the functioning of institutions and capacity of administrators could help civil services better use revenue and natural resources to reduce poverty. Increasingly, administrators are using capacity building to encourage ownership through participation and mutual exchange of knowledge (Hubert *et al.*, 2021) [25]. Building individual capacity in terms of natural resource management would involve increasing the level of expertise in its legal, scientific, or technical aspects.

For example, increasing expertise in the implementation and monitoring of regulatory compliance or increasing awareness of the conflict risk in managing natural resources would increase the government and different communities’ ability to address these conflicts. Moreover, increasing scientific expertise in the geological field would allow DRC’s institutions to improve their negotiating power with extractive industry counterparts. Similarly, capacity building for local businesses could help to promote the development of homegrown industries in the minerals sector.

The Statistics for Results Facility (SRF), a multi-donor trust fund, worked with countries to improve the production, availability, and use of data for evidence-based decision making. Its holistic, system-wide approach to tackling data challenges from different entry points produced a number of concrete and sustainable results in countries, leading to better coordination and new waves of technical and financial support for better data and lasting impact. SRF supported 8 countries and one region-wide project in Africa: Afghanistan, Democratic Republic of Congo, Ethiopia, Ghana, Lao PDR, Nigeria, Rwanda, and Senegal.

Today we're highlighting a project from the Democratic Republic of the Congo (DRC), which aimed to strengthen the capacity of the National Institute of Statistics (INS) to both generate and disseminate robust data.

With an estimated population of 84 million people in 2018, DRC enjoys a wide variety of natural resources like minerals and fresh water. Unfortunately, the country has suffered from a series of violent conflicts and remains one of the poorest countries in the world. In this environment, the national statistical system of the DRC had long suffered from deficiencies in human resources, institutional capacity and statistical information (the most recent population census being for 1984), and governance mechanisms for the National Statistical Systems and the INS were incomplete when the project started. Ready to help the DRC change this narrative, SRF disbursed nearly \$12 million USD and catalyzed substantial results.

Three components comprised the overall strategy: human capital, physical resources, and data production. First, SRF aimed to instill INS workers with new knowledge, offering them the opportunity to study for a degree in statistics, computer science, or demography. The World Bank recognizes that human capital is a key feature in every country's development: it is our world's most precious and often most overlooked resource. Furthering statistical workers' education not only improves the quality of the data they collect, analyze, and disseminate, but also provides a more well-rounded approach to the entire statistical process. Thanks to a grant from the Facility, 23 young Congolese pursued formal degrees from one of the top institutions like the Institute of Statistics and Applied Economics in Abidjan, Ivory Coast. Among them, 15 completed the Bachelors' program and are applying their new skills at INS, while the rest are continuing education to become Statistics Engineers. SRF also supported on-the-job training for statistical skills such as SPSS, STATA, and R for 284 existing INS staff members.

Another contributing factor to INS capacity is their physical resources. Upon arrival, SRF assessed that the pre-existing INS facilities were unsupportive of a modern work environment that requires advanced technology. Demolition and reconstruction efforts established a six-floor office building complete with IT connection, training rooms, and a dedicated library and archive to enable more efficient work environment and user-friendly data dissemination. SRF also helped the INS develop its own website in line with best practice data archive and dissemination policies.

With human capital and physical resources in place, SRF also supported data collection activities and the data management process. For example, SRF supported the preparatory stages of the population and housing census, including the pilot census cartography, development of its methodology, training and deployment of field teams, and the pilot report. This support was particularly relevant for the DRC, which had not delivered a census in 30 years. The project also supported preparation for the enterprise census, training roughly 1700

enumerators and supervisors.

Inspired by SRF's progress, other partners joined forces to continue the support in DRC. This is the true heart of SRF: its catalytic effect. The population and housing census will continue to receive support from the United Nations Population Fund, and an IDA-funded project continues to assist the DRC's enterprise census, illustrating the gains that can be made when the development partners collaborate to support capacity building.

During implementation, the project experienced several setbacks mainly due to the fragile security and political situation and low capacity for the project implementation, which caused delays in realizing program objectives. The INS and the SRF team continued to progress despite challenges by assessing the situation and adjusting the approaches as necessary. Country commitment, realistic expectation setting, careful planning for the sequence of the project, flexibility in implementation, and patience were some of the key lessons learned from this project and can be applied to other projects in the country and region as well.

The Statistics for Results Facility recognizes that data scarcity and lack of statistical capacity around the world does not have a silver bullet solution; rather, each country requires customized new approaches to build capacity, provide trainings and infrastructure, and most importantly instill confidence that better data can unlock sustainable development solutions. By tailoring specific strategies to reach unique country goals, SRF ensures that clients can achieve concrete outcomes, step by step. However, a particularly fragile country like the DRC will need continued investments over time to sustainably transform their statistical capacity. Now that the Statistics for Results Facility has closed, its catalytic effect is more important than ever to galvanize new waves of support to continue this vital work.

On the international level, governance initiatives relevant to the environment in the DRC are conditioned by the various international treaties and environmental agreements to which the country is a signatory. These initiatives and treaties specify actions to protect the DRC's biodiversity, endangered species, timber, and wetlands as well as to mitigate climate change.

USAID and the European Development Fund both have agreements with the DRC to fund such programs, which encompass regional conservation and production areas. Given this outside support for local and national institutions, it is vital to create an implementation framework that creates coherent sector-wide programs.

Specifically, the DRC is currently developing a governance framework for the forestry sector. The population is highly dependent on the forestry sector and, although precise data is uncertain, the expansive forests of the DRC provide a wide array of benefits, including timber for domestic use and export, fuel wood, a variety of forest foods and medicines, and a carbon sink for sequestration programs. It is estimated that the DRC's timber resources are equal to that of all other African countries combined and the timber industry is expected to benefit

from increasing demand in China and India. Therefore, this sector is a high priority for reform. The ongoing forestry reforms are part of the preparation of a national strategy for Reducing Emissions from Deforestation and Forest Degradation (“REDD”), by the Ministry of Environment, Nature Conservation and Tourism (known by the French acronym “MECNT”). The DRC’s 2002 Forest Code is an important first step in both regulating an important resource and creating an implementation framework for fund programs such as REDD.

5. Conclusions

The theories of environmental scarcity and of natural resources wealth as conflict causes in the DRC are well documented. What remains unclear, however, is why large-scale armed violence persists in some eastern provinces of the country, while other, equally resource rich provinces, such as Katanga and the hinterlands of the Kivu Provinces, escape such violence. This suggests that additional tensions, such as those between industrial and artisanal miners and those linked to local socioeconomic factors are of the utmost relevance.

This article review has described the consequences of prolonged instability for natural resource management in the DRC. Further, natural resources management remains a low priority for political actors, many of whom favor the consolidation of power and wealth. The presence of those stakeholders who instigate and profit from instability constitutes the major obstacle to effective natural resources management and to improvements in overall governance in the DRC.

The political, economic, and social contexts in which natural resources are used and the manner in which resources are managed is paramount to prevent and manage conflicts at all levels. The nature and scale of the conflicts described in this paper are each different and, therefore, the management approaches correspondingly different.

This article has also outlined a number of ways in which donor institutions have worked with policymakers to improve resource governance in the DRC. The initiatives described support alternative income opportunities for local communities, redistribution of revenues from some extractive industries, and prevention of local resources usage conflicts. Many of the natural resources management activities have had active participation of communities as a key component.

Governance objectives are often broadly formulated to strengthen institutions, build institutional and human capacity, and improve rule of law. These broad aims, while useful as guiding principles, remain extremely abstract. Successful governance, however, requires specific measures and binding timeframes for implementation in order to reform key areas such as the accurate monitoring and legal enforcement of natural resources management strategies. While the institutional structures and processes may already be in place, it will still take a long planning process, significant additional resources, and political will to achieve the needed transparency and accountability for the management of all

natural resources sectors in the DRC.

Conflicts of Interest

The authors declare no conflicts of interest.

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