

Diffuse Responsibility Undermines Public Oversight: A Field Experiment at Bwindi National Park, Uganda

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Abstract. Bureaucratic corruption persists in many settings because responsibility for public projects is diffuse, as is responsibility for oversight. We hypothesized that the dissemination of citizen monitoring in ways that give individual authorities specific knowledge of mismanagement would improve the delivery of public projects by activating specific responsibility to correct problems. Working with the Uganda Wildlife Authority, we implemented a field experiment that involved citizen monitoring of a national park revenue-sharing program and the delivery of reports about the implementation status of community projects to the highest-ranking administrative official responsible for oversight. Counter to our expectations, we did not find evidence that the dissemination of reports improved the delivery of revenue-sharing projects. Follow-up interviews found that the targeted officials did not use the information and perhaps even actively disregarded reports to avoid specific responsibility. However, the treatment also provided information to citizens about what they should expect, which instigated several public claims for accountability that officials could not ignore, prompting more aggressive oversight. Based on this alternative channel, we conclude that anti-corruption initiatives based on citizen monitoring need to make specific responsibility unavoidable for relevant officials, but that the strategies for promoting specific responsibility need further consideration.

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In political and organizational life two basic imperatives clash: a desire to blame and a reluctance to accept blame.

Moynihan (2012)

Introduction

When responsibility for the administration of public programs and policies is diffused across different officials and different levels of government, specific responsibility for the delivery of programs becomes more difficult to attribute to any single official. When officials have varying and overlapping responsibilities for budgeting, procurement, implementation, and oversight, it is difficult to pinpoint the sources of failure in public administration. Diffuse responsibility thus creates possibilities for blame-shifting, obfuscation, and corruption in the management of public funds. Indeed, a variety of challenges in governance have been attributed to a lack of clear responsibility, including electoral accountability ([Schwindt-Bayer and Tavits, 2016](#); [Tavits, 2007](#)), bureaucratic performance ([Hood, 2011](#)), and politicians' oversight of bureaucracies ([Gulzar and Pasquale, 2017](#)).

In light of the problems created by diffuse responsibility within bureaucracies, we tested whether citizen monitoring of community development projects could curb corruption when it is delivered such that specific officials with direct responsibility for oversight gain knowledge of specific problems. While citizen monitoring has been organized across many contexts with the aim of improving the accountability of governments, many results have been disappointing ([Banerjee et al., 2010](#); [Olken, 2007](#); [Banerjee and Duflo, 2006](#); [Grossman et al., 2018](#)). To the extent that existing research has converged on a reason for the disappointing results, it is that citizen monitoring often does not reach specific officials with authority to act, nor does it clarify the responsibility of specific officials to fix problems. Our core idea is that high-authority officials are likely to face lower penalties and blame – in terms of prestige, employment, and promotion – for problems that arise that they do not know about, as compared to specific problems that they know about. The key then is for citizen monitoring to activate specific responsibility.

In many settings, the risk of attracting blame will cause officials to actively avoid knowledge of

problems that are costly to address in their area of responsibility. Specific knowledge about specific problems may trigger a duty and expectation to act. If it were possible to deliver citizen monitoring in a way that sets in motion specific responsibility and a common understanding that relevant officials have knowledge of specific problems, then the cost of shirking by officials in positions to do something about poor performance might be increased, leading to more accountability in public administration. Enlisting officials of a comparable authority to target officials in the delivery of citizen monitoring might create the understanding that specific problems are common knowledge. In this circumstance, we expected that the lack of a response by the target official will be perceived as shirking, rather than ignorance, which should provide incentives for more active oversight.

We developed a unique partnership with the Uganda Wildlife Authority (UWA) to test an approach that sought to clarify specific knowledge about problems and the responsibility to act. We worked with UWA to compile and deliver reports from citizens about the implementation of revenue-sharing projects to the highest-ranking officials in district governments, who have ultimate responsibility for all public spending. We established a voice-response platform, the Bwindi Information Network, that allowed citizens in half of the randomly-assigned villages around the park to send status reports about the implementation of community-level projects. Residents in treatment villages also received notices about the value of approved projects and the intended timing of implementation, including information about specific transfers of funds to local governments. We aggregated the citizen monitoring at the village level into reports for each district. The Chief Warden at Bwindi National Park, a nationally-appointed figure, physically delivered the reports to the districts' chief administrative officers. Our partnership with UWA was thus important not only for gaining access to information about projects, but also for delivering the experimental treatment in a way that would heighten the duty of chief administrative officers to respond by making their specific knowledge of problems common knowledge.

Counter to our expectations, we did not find evidence that the intervention improved the implementation of revenue-sharing projects, most of which were unverifiable in field audits and many of which were not finished or never delivered. We also did not find evidence that citizen mon-

itoring increased residents' sense of efficacy or satisfaction with revenue sharing. We found no evidence that residents observed projects being delivered more successfully when people in their village had access to the monitoring platform. Interviews with district officials after the field experiment concluded indicated that the reports generated from citizen monitoring and delivered by senior wardens at UWA were disregarded. We obtained no evidence from interviews with relevant officials that the reports instigated any further monitoring or oversight actions.

To explore the reasons why the results differed from our expectations, we conducted a broad set of 21 interviews with local officials, covering each of the three districts surrounding Bwindi National Park. In each district, we interviewed the chief administrative officer, elected and appointed sub-county officials, members of village- and parish-level project procurement committees, members of village project management committees, and elected village chairpersons. The interviews provide a rich account of the reasons why accountability in revenue-sharing is limited, including how diffuse responsibility among officials creates opportunities for collusion between contractors and officials that results in the mismanagement of funds.

More positively, through these interviews we uncovered three examples where the provision of information about approved projects to residents instigated formal claims by residents for the chief administrative officers to solve problems related to mismanagement, sometimes leading to the transfer or firing of local officials. These claims and the responses they received support the idea that clarifying knowledge about a specific problem is an important antecedent to accountability when local institutions are well-suited to obfuscation, corruption, and blame shifting. The high-level officials we targeted with the reports got involved when their knowledge about specific problems became public, although not in ways that we anticipated.

Our main contribution in this paper is a proposal for a new way to disseminate citizen monitoring as an anti-corruption strategy. It is based on the idea that officials will be punished more severely for negligence as compared to ignorance about problems in their area of authority. Through a unique partnership with a government agency, we are able to offer a test of this innovative anti-corruption strategy. The results of the field experiment are not encouraging, but our partnership

gave us the opportunity to delve more deeply into the pathologies of diffuse responsibility, including how officials may have reacted strategically to the treatment in ways that we did not expect, but which is consistent with broader theoretical expectations. Through in-depth qualitative fieldwork, we are able to offer evidence about the kinds of public claims that create specific responsibility and an oversight response for corruption.

We also demonstrate that a research partnership with a government agency to test new ideas and strategies for anti-corruption – even a partnership that yielded unexpected and outwardly disappointing results – opened new and productive conversations about institutional design. The results of this partnership, field experiment, and field study have informed efforts to redesign the guidelines for revenue sharing at the national level, and thus point to the ways that evidence from research partnerships can be incorporated into policy-making. In particular, the federal government is reconsidering the problems involving diffuse responsibility in revenue sharing. Additionally, government officials now see the importance of promoting public knowledge about when funds are disbursed to various parties, as this would help promote more specific responsibility among cognizant officials. While the results of the field experiment did not align with our expectations, the learning created through partnership and by trying to solve governance problems has prompted an earnest search for improved institutional designs, most of which have focused on consolidating responsibility within the revenue-sharing process.

Bureaucratic Negligence or Ignorance?

The core idea behind our study is that bureaucrats will be punished more severely for problems that emerge in their area of authority that they know about, as compared to problems they do not know about. Shirking responsibility to act on a known problem is worse – for prestige, employment, or career advancement – than ignorance about a problem. For a problem that an official does not know about, it is often possible to shift blame to other agencies or officials. In the extreme case, it is even possible to take credit for fixing problems as they are discovered, which might create incentives to avoid active oversight ([McCubbins and Schwartz, 1984](#)).

Consider an official with responsibility for oversight in a given area of authority. That official likely has a number of problems presented to her in the course of her duties. The problems presented to her can be either diffuse or specific. Diffuse problems are of a general nature and would take effort to track down and act on, while specific problems are immediately actionable because they are specific instances of a diffuse problem. For example, an oversight official's knowledge that there are likely problems in the accounting of a program is diffuse, while knowledge of an instance where funds are misappropriated is specific.

When faced with diffuse problems for which there is shared responsibility among many officials, an official with responsibility for oversight can choose to actively investigate and attempt to fix problems. Alternatively, she can wait for specific instances of the problem to emerge and then fix them, and in the process shift blame to lower-level officials with delegated responsibility (Hood, 2011). Specific problems are less costly for the official to fix because extra monitoring to identify them is unnecessary. However, the official must weigh the blame that she is likely to attract for a problem in her area of authority against the effort need to identify and fix problems that are diffuse. When the official does not have knowledge about specific problems, we contend that the blame that she will attract is likely to be low, especially in settings with overlapping and shared responsibilities. Thus, in many circumstances where responsibility is diffuse and thus the blame incurred by the individual official is low, it will not be in her interest to pay the high cost of trying to find and fix diffuse problems.

When the official gains knowledge about a specific problem, we predict the outcome will be different because the blame for inaction about a known problem will be higher and the cost of identifying the problem approaches zero. On the first point, when an individual official has verifiable knowledge about a specific problem, she will incur greater blame for failing to solve the problem. On the later point, when an official has specific knowledge of a problem, the cost of addressing it is likely to be lower because it is not necessary to exert effort to find the problem. Thus, we expect that when oversight officials are presented with information that both lowers their cost of acting and increases the blame that they would incur for not acting, that would likely change the way they

behave relative to problems in their area of authority.

While we consider oversight of public programs specifically, a number of scholars have considered how the incentive to avoid blame is responsible for many of the dysfunctions of the state. In his seminal article, [Weaver \(1986\)](#) argues that negative events tend to attract more attention than positive events, which causes both politicians and officials to adopt strategies that limit their exposure to negative events. Some strategies include delegation of responsibility to other parties and the creation of procedures that limit discretion. In many situations where the benefits of good performance for officials are lower than than the potential costs of blame for negative events, officials will be pushed to choose strategies that first and foremost limit their exposure to blame. Indeed, [Hood \(2002, 180\)](#) highlights how elected officials often adopt defensive strategies that seek to "avoid personal or institutional blame or liability... for instance by rebuttal, denial or the adoption of organizational boundaries that make responsibility ambiguous."

The strategy of blame avoidance is common among bureaucrats as well. [Hood \(2007\)](#) reviews how blame avoidance is often a dominant strategy for bureaucrats, since negative information about performance tends to receive more attention than positive information. He describes a class of "agency strategies" for blame-avoidance that involve sharing authority across agencies. In particular, delegation to lower-level officials can be a strategy to avoid the risk of blame for decisions or settings where problems are likely to emerge (see also [Fiorina, 1982](#); [Hood, 2011](#)). Under conditions where decision are likely to attract negative attention or problems are likely to emerge, [Hood \(2007, 200\)](#) argues that "we would expect to see widespread delegation of potentially blame-attracting activities."

What makes delegation and shared responsibility for the implementation of public programs a particularly potent strategy for avoiding blame, we predict, is that it insulates authorities from specific knowledge of problems that they would otherwise have to address. Knowledge about specific problems is likely to compel action from high-level public officials, especially when it involves significant failure in the area where they are supposed to be exercising oversight. It may therefore be the dominant strategy to avoid knowledge of specific problems that are costly to fix,

because such knowledge entails significant risks were those problems to become known to the public and higher authorities. More broadly, the idea that agencies and officials avoid knowledge that might compel them to act in ways different than current practice is a common concern across other circumstances in public administration (Greiling and Halachmi, 2013; Pritchett, 2002).

We expect that bureaucrats will often avoid information that would compel them to act, especially about problems that are difficult to detect and address like corruption. If bureaucrats gain knowledge about problems in their area of authority and it is likely that their principals will find out about the problem and also find out about their knowledge of the problem, then they will have to seriously consider fixing problems that come to their attention. Not doing so would have to be weighed against the increased blame for negligence were the problem discovered later by others. The risk to an individual official in a position of authority over a problem is much higher when the official has verifiable knowledge about it. Negligence is much more risky than ignorance for an official in a position of authority.

We expected that corruption in bureaucracies often persists because of blame and responsibility shifting. If this is the case, then interventions that both (a) clarify specific responsibility; and (b) make knowledge about specific problems more likely to be discovered by higher authorities, should be likely to promote the proper management of public funds. Thus, interventions need to surface specific problems, not diffuse problems, and they need to be delivered in a way that makes addressing problems the most likely outcome by creating an individual duty to act. We expected that citizen monitoring of public programs, when collecting the right kind of information and disseminating it in ways that make specific responsibility unavoidable, might change the dynamic of blame avoidance that allows corruption to persist in many bureaucracies.

Citizen Monitoring and Specific Knowledge

Citizen monitoring might serve as an excellent tool for creating the kind of specific knowledge that would prompt bureaucrats to act and address problems in public administration. There is a great deal of optimism that monitoring by citizens might improve governance generally. Because

citizens are often directly interested in securing better performance from governments, they frequently have incentives to invest time and resources into monitoring public programs. They also experience the delivery or failure of public programs directly and thus have timely information that can be useful for revealing specific problems to officials and politicians.

Yet, citizen monitoring often fails to promote accountability because the information produced by citizens is not linked to decisionmaking or oversight. Citizens often lack the tools to sanction and reward officials for performance on their own, which is why many monitoring interventions have yielded disappointing results (Banerjee and Duflo, 2006). For instance, Olken (2007) finds that top-down auditing of road construction projects in Indonesia decreased corruption, but that citizen comments about the same road projects dropped into a box prior to a community meeting did not produce effects distinguishable from zero. Additionally, Banerjee et al. (2004) found that citizen audits of health facilities for absenteeism, even when properly implemented, did not lead to any kind of sanctioning activity and did not change the performance of health providers. Similar results have emerged in recent experiments that use communication technologies to enhance citizens' potential to convey information about the status of public services to politicians (Grossman et al., 2018). Yet, none of these examples include dissemination of information about specific problems to officials with specific authority to correct problems in ways that might increase the risks of not responding to problems.

Citizen monitoring has achieved positive results when social sanctioning is possible, which is mainly relevant at local scales. Perhaps the best known example is Björkman and Svensson (2009), where community monitoring of local health facilities via reports cards and meetings in Uganda generated significant improvements to health outcomes, with social pressure as the hypothesized mechanism. Yet even these exciting results have come into question following large-scale replication (Raffler et al., 2018). The challenge of using citizen monitoring to improve public services and performance by officials is much more challenging when providers or officials are not bound by social ties to citizens. Even with significant decentralization, most public services and official programs are not primarily planned and implemented by the most local levels of government where

social pressures could reasonably be expected to affect the actions of officials.

Against the backdrop of the mixed record of citizen monitoring, more focus is needed on the ways that citizen monitoring can change the dynamics of the ongoing relationship between citizens and officials (Fox, 2015). To change the relationship between citizens and officials, monitoring needs to facilitate either sanctioning or rewards for performance by officials. We designed a treatment that would leverage citizen monitoring to create specific responsibility for and knowledge of problems in public programs. The goal in partnering with UWA was to deliver reports in such a way that specific problems were clarified, as was the risk of non-response to the problem because a national agency involved in delivery also clearly had knowledge of the same specific problems.

Two recent studies examine citizen monitoring through communication technologies, with some positive results. Callen et al. (2016) conduct a field experiment in Pakistan that involved giving health inspectors access to smartphones that allow them to submit reports about doctor absenteeism in real-time, which doubled the number of inspections. The reports are uploaded to a user-friendly dashboard that can be accessed by senior health officials. This monitoring only had positive effects when the resulting reports were experimentally made more salient, accomplished by visually flagging facilities with the worst absenteeism. Furthermore, health officials using the monitoring often reported that politicians interfered with their attempts to exercise oversight of doctors who should have been staffing health facilities, with interference more common in districts with lower electoral competitiveness. As a consequence, doctors only responded to the increase in inspections in the most politically competitive locations, which were least likely to be subject to interference by politicians. Muralidharan et al. (2018) report on a field experiment that involved calling farmers about their receipt of subsidies from local governments in India and informing local officials about the monitoring. They observe a small increase in the proportion of farmers receiving subsidies when officials are informed that monitoring is happening, but not to the results of monitoring, pointing that the effect of scrutiny and potential common knowledge of problems itself can be influential. Both of these examples point to the potential of monitoring disseminated in a way that increases the risks to officials of not responding to specific problems.

Research Design

Overview We collected the mobile phone numbers of approximately 4,000 local residents in all 94 frontline communities near Bwindi National Park, Uganda for a multi-phase project that was first launched in 2014. In the past year, working with the Uganda Wildlife Authority, we launched and tested an intervention to overcome corruption in the implementation of revenue-sharing. For half of the villages around the park, assigned randomly, we sent out notices informing residents about the funding and projects approved by UWA and collected bi-weekly reports about the implementation status of village revenue-sharing projects using an automated voice-response system that polled residents about the status of implementation. In particular, we asked residents whether the project being implemented was the project that was approved, in addition to its implementation status. Our research team collated these responses into five official reports over five months for each of three districts that surround the park.

The Chief Warden of Bwindi National Park certified and attached a cover letter to the reports generated from residents' monitoring. National Park staff hand delivered the reports to the office of the Chief Administrative Officer (CAO) at each of the three districts with frontline Bwindi villages, signaling the strong interest of a national-level agency in promoting good governance. The Community Warden of Bwindi National Park personally called each of the CAOs and confirmed receipt of the first report and offered to answer any questions about it. The management of Bwindi National Park report reinforcing delivery of the reports in ongoing conversations with the CAOs and other district officials. The CAO at each district has a primary directive of ensuring good governance at the local level and overseeing the use of public funds by sub-county and village governments. The goal of the intervention is to use emerging technologies to make sure that citizen monitoring reaches officials that have the resources and authority to oversee revenue-sharing funds.

Setting The revenue-sharing program we study is an increasingly common model of benefit-sharing that aims to promote equitable conservation in low-income countries ([Archabald and](#)

Naughton-Treves, 2001; Tumusiime and Vedeld, 2012). Many of the tourism-derived funds that are intended to benefit local communities are misdirected and lost when they pass through local governments, with local people reporting that corruption is a major problem in the setting of our study. This is a major problem, since most of the people living near Bwindi National Park are very poor. The average household income in the area is less than 300 USD per year and the average family in the area has seven children. Revenue sharing is intended to deliver on average more than 1,200 USD per village for community development, roughly equal to the incomes of 4-5 households in villages that on average contain approximately 200 households. Thus, revenue sharing is supposed to offer significant value to local residents.

Each year, the park management announces a total amount of revenue to be shared with front-line villages around Bwindi National Park (see Figure 1). In principle, this amount should be equal to 20 percent of the gate fees that are collected when tourists enter Bwindi National Park for hiking, gorilla trekking, or bird watching.¹ The park uses a formula to determine the amount to be shared with each village based on the number of households and the length of the shared edge with the park. Residents are asked to elect a *project management committee* within each village to formulate a collective plan for using the funds after holding a community meeting. This proposal is approved by the Uganda Wildlife Authority, sometimes subject to a request for revisions. Funds for approved projects are passed to the district government, which passes the funds to the sub-county government, which pays contractors selected by village- or parish-level procurement committees (see Figure 2).

Communities choose a variety of projects with the funds that are allocated to their villages. All villages are required to include some "problem animal management" activities that reduce human-wildlife conflict, such as planting thorny plants along the edge of the park edge to deter animals from entering farmers' fields. Each village, through the project management committee, may request any other project that meets local needs. This year revenue-sharing projects included animal husbandry, gravity-fed water systems, road grading, chairs for a community meeting space,

¹The revenues from the gorilla trekking permits, which presently cost around 600 USD per visitor, are not shared with local communities.

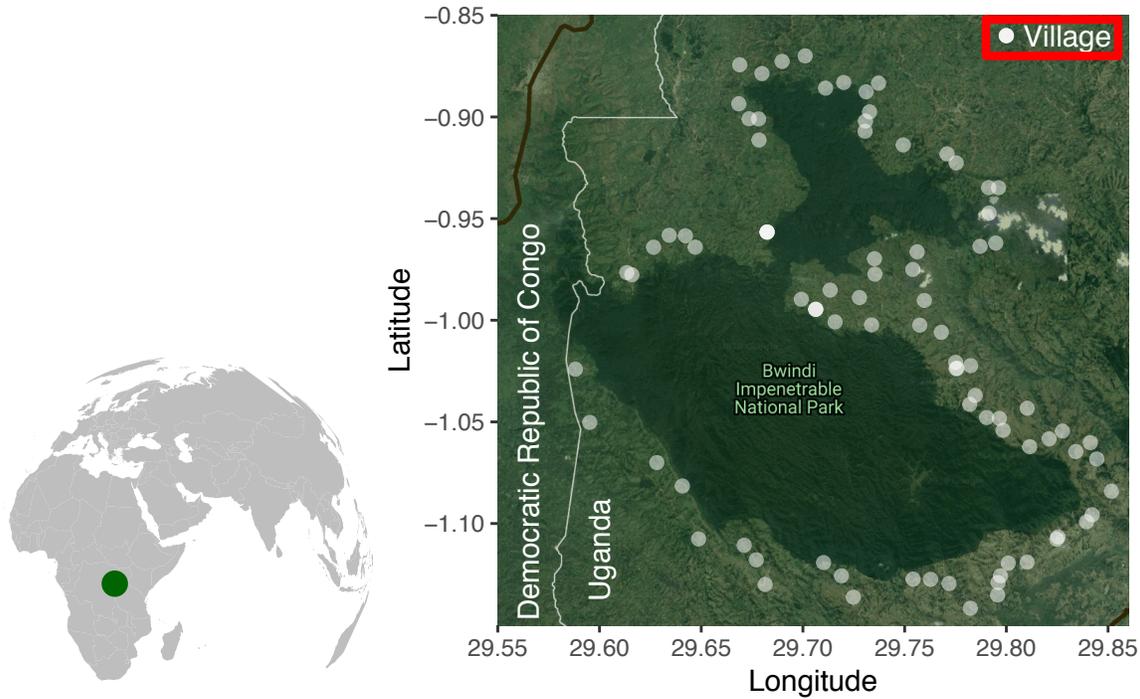


Figure 1: **Map of the villages surrounding Bwindi National Park.** GPS locations recorded during audits by enumerators. Because of tablet malfunctions, four villages in the sample are not mapped. The satellite-based image of the park shows that agricultural land completely surround the park. Images courtesy and copyright of Google Maps.

and materials for building tourist facilities, among other projects. The process of selecting projects and the challenges of elite capture of the selection process and the designation of beneficiaries is discussed in [Buntaine et al. \(2018\)](#).

Problem Diagnosis The design and management of the national park revenue-sharing program is ripe for blame-shifting and the avoidance of specific responsibility for implementation among cognizant officials ([Archabald and Naughton-Treves, 2001](#); [Buntaine et al., 2018](#); [Tumusiime and Vedeld, 2012](#); [Adams et al., 2004](#); [Laudati, 2010](#)). In the setting of our study, Bwindi National Park, internal park audits suggest that up to 80 percent of revenue-sharing funds are diverted from their intended purpose by the local governments that manage implementation. UWA is required by law to pass funds to district governments and has no formal authority over implementation of projects, other than an ability to monitor implementation and pass information about problems

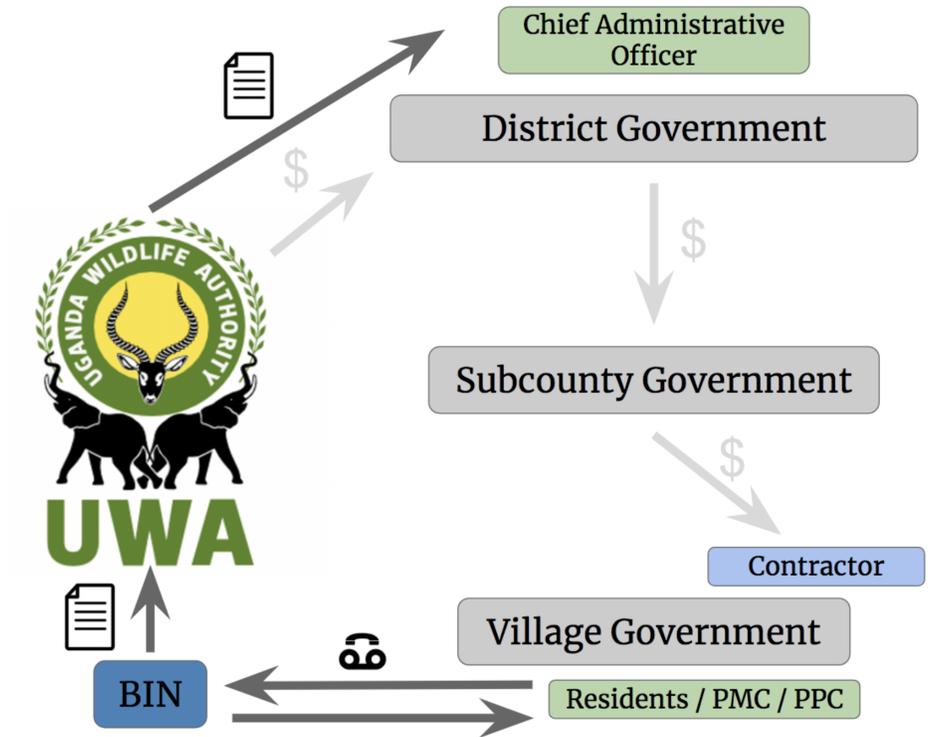


Figure 2: **Flows of funds and information within the Bwindi National Park revenue sharing process.** The Bwindi Information Network collected information from residents, compiled that information into reports, and delivered them to the Uganda Wildlife Authority, which hand-delivered the reports to the Chief Administrative Officer of each district government.

along to district governments. The district governments, and the Chief Administrative Officers that oversee all public spending, are tasked with a heavy load and revenue-sharing makes up only a small part of district budgets. Responsibility for planning and implementation is delegated to sub-counties, which helps these higher-level officials avoid blame for problems. For their part, chief administrators at the sub-county level often decry the technical ineptitude of projects or highlight how they rely on local management and procurement committees to advise them on appropriate projects and to tell them when to release funds to contractors. In interviews with all of the relevant actors following the conclusion of the field experiment (described below), we found that almost every type of official found reason to blame others for problems in the scheme. Thus, the field experiment took place in the context of highly diffuse responsibility and an institutional design tailor-made for blame-shifting behavior. We hypothesized that if we could make specific responsibility apparent at the highest levels of authority, then it would be possible to overcome

many of the problems that have persisted with the revenue-sharing program for decades.

Sample Our experimental sample is the set of villages eligible to take part in the revenue-sharing program of Bwindi National Park. All villages that share an edge with the park boundary are eligible to propose a community project within a given budget that is determined by a formula that takes population and the length of park edge into account. In a previous phase of the project, we investigated whether sending information to residents about their rights and opportunities to participate in designing the projects supported by revenue-sharing funds would overcome elite capture and promote more effective participation (Buntaine et al., 2018). We found little evidence that information sent *to* residents increased effective participation. In the current study, we use the same sample of residents in the same frontline villages, plus approximately 2,000 additional residents recruited to boost the number of reporters. Unlike the previous round, we focus on how information compiled *from* residents and sent to high-ranking district officials affects the oversight and ultimately the delivery of revenue-sharing projects near Bwindi National Park.

Treatment We prompted enrolled citizens five times to provide status reports about their village's revenue sharing project, always accompanied by information about the approved project and the amount of funds approved for the project. After receiving information from citizens about the status of this or a substitute project through the toll-free system that called each individual who provided informed consent three times per polling round, we compiled the resulting information into reports at the district level. These reports broke down the responses of the residents and visually highlighted instances where a majority of resident reports indicated a problem. In particular, the reports contained information on the number and proportion of residents who: (1) believed the approved project had been completed; (2) reported different reasons for the project not being completed; and (3) felt satisfied with the implementation of the project. The information was organized by sub-county and then village. The villages around Bwindi National Park are in three districts,

so three separate reports were prepared for each of four citizen monitoring rounds.² We did not reach out to the officials being monitored about the treatment, as we wished to isolate a direct oversight pathway as the mechanism to improved project delivery, in contrast with [Muralidharan et al. \(2018\)](#) that reports on scrutiny.

Audits We conducted independent audits of all revenue-sharing projects at endline, which included photographing and describing all work completed in all 91 revenue-sharing villages and interviews with local people and local council chairpersons about the delivery of projects. In particular, we entered every village around the park and asked the village chair to guide our enumerators to see the delivered revenue-sharing project. If the village chair was not available, we asked to be guided by another elder or a member of the project management committee of the village. We described and photographed all project shown to us by the local guide, including whether funds were spent on an approved project or substitute projects. We also recorded and photographed any evidence of labeling for revenue-sharing projects, which is required of all projects by the revenue-sharing guidelines. We use these in-field, physical audits of projects as our primary measures of whether the citizen monitoring treatment improved the delivery of revenue-sharing projects. We collect no other village-level data beyond these audits.

Surveys In addition to audits, we completed a survey in the field with a representative sample of residents in treatment and control villages to assess attitudes and opinions about the revenue-sharing program and life near Bwindi National Park. Enumerators entered each village and conducted a random walk through the village to identify respondents until at least 20 individuals were reached within each of the villages. The surveys asked respondents to report on a number of demographic characteristics, in addition to perceptions and attitudes about revenue sharing. As part of surveys, we also asked people whether they could show us physical evidence of revenue-sharing projects near to where they lived or where our enumeration team encountered the

²The research team prepared a fifth set of reports, but the Uganda Wildlife Authority never delivered them to the districts because relevant staff were away on travel.

respondent. We use this physical evidence from resident surveys as a check on the audit results, particularly for items that were widely dispersed throughout villages. Descriptive statistics about survey respondents are displayed in Appendix, Table A1. An overview of the experimental design is displayed in Figure 3.

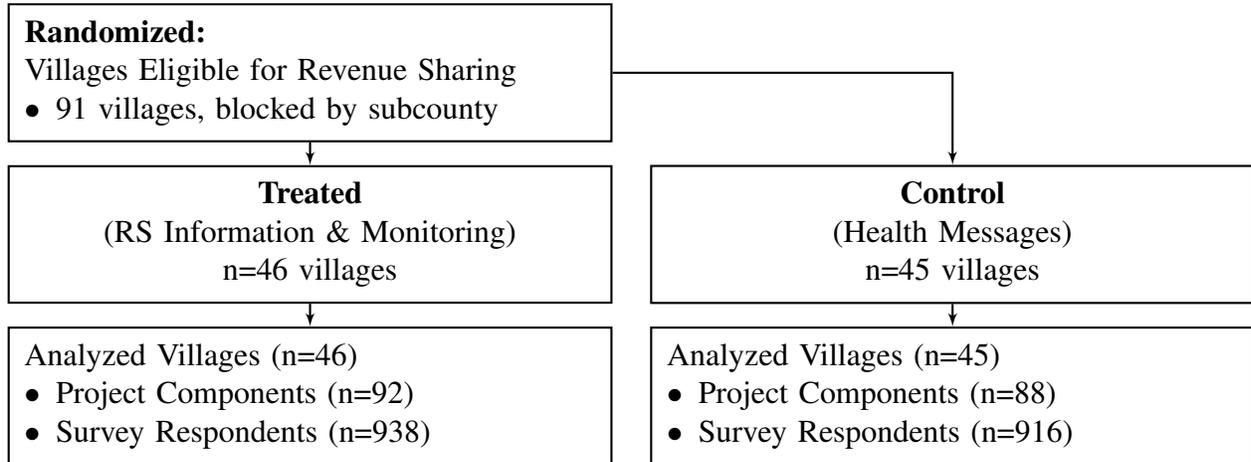


Figure 3: **CONSORT diagram tracking study design.**

Quality of citizen monitoring Because our partners at UWA were concerned about the quality of information that was contained in the reports they were forwarding to the Chief Administrative Officers, they requested a joint audit of the quality of information in 10 randomly-selected villages around the park after the third report based on citizen monitoring was compiled. A representative from our research team, together with park rangers, visited in-person 10 villages and conducted interviews with local leaders and residents about the current status of implementation for revenue-sharing projects. The audits suggested that the information provided by citizens was accurate on average and that delays in the delivery and implementation of projects were correctly noted by citizens across the entire sample of villages audited. At the conclusion of this audit, our partners at UWA were convinced that the reports should continue to be sent to the districts as part of the treatment.

Analytical Strategy We focus on simple difference-in-means, with p -values computed by randomization inferences assuming the sharp null hypothesis, as outlined in our pre-analysis plan. We also use regression adjustment where possible, again following our pre-analysis plan. For regression adjustment, we include block fixed-effects, and for individual-level analyses, include the following covariates: gender, age, income, and literacy. We report the standard error of the sharp null hypothesis computed by randomization inference for each estimate of treatment effects. To compute this value, we exactly replicate the random assignment procedure 10,000 times assuming no treatment effect for any unit (i.e., sharp null hypothesis) and record the variance in the parameter estimate that results from the randomization design, including blocking at the subcounty level.

We did not anticipate at the time of the pre-registration that a small number of villages would share projects with other villages within their sub-counties. Projects of this type include building tourist facilities and pooling funds to grade common feeder roads into proximate villages. Because these types of projects raise clear issues of spillover between treatment and control units, we exclude them from our analysis.

Results

Audits We see no differences in project delivery between treatment and control villages based on data from physical audits (Table 1). We hypothesized that citizen monitoring and the delivery of the resulting reports to district officials would improve the delivery of revenue-sharing projects. Across a host of outcomes measured as part of physical field audits, including whether implementation was finished, whether the project implemented was the project approved by UWA, whether the project could be verified as complete, the number of dispersed items that could be located by village guides, and whether the project components could be linked to revenue sharing, we find that treatment villages did not do better and often did worse than control villages. As further discussed in SI Appendix E and displayed in Table E1, we do not detect spillover from contiguous villages and direct treatment effects are not modified by the nearby presence of other treated villages.

Perhaps the most striking descriptive result is that an overwhelming proportion of projects

Table 1: **Implementation of project components recorded by field audits**

Condition	Finished (Implementation)	Approved Project	Complete (Non-dispersed)	Pictures (Dispersed)	Verifiable	Somewhat Verifiable
Treatment	0.741 (0.049)	0.753 (0.048)	0.250 (0.154)	5.918 (0.455)	0.025 (0.017)	0.198 (0.044)
Control	0.838 (0.041)	0.875 (0.037)	0.500 (0.157)	7.114 (0.447)	0.000 (0.000)	0.200 (0.045)
Difference (RI)	-0.097 (0.050) p=0.977	-0.122 (0.051) p=0.993	-0.250 (0.214) p=0.891	-1.196 (0.447) p=0.996	0.025 (0.025) p=0.290	-0.002 (0.077) p=0.527
FE OLS (RI)	-0.084 (0.049) p=0.958	-0.110 (0.050) p=0.987	-- (--)	-1.009 (0.430) p=0.992	0.020 (0.020) p=0.335	-0.003 (0.079) p=0.519
N	161	161	18	143	161	161

Variables: *Finished* is a binary indicator of whether implementation was finished at the time of the field audit. *Approved Project* measures the proportion of implemented or partially implemented projects that were approved by UWA. *Complete* is a binary indicator of whether non-dispersed projects were implemented completely or somewhat completely as revealed by field audits. *Pictures* is a numeric variable from 0-10 of the number of pictures of dispersed items captured during audits. *Verifiable* is a binary indicator of whether project components could be definitively linked to revenue sharing. *Somewhat verifiable* is a binary indicator of whether project components could be partially linked to revenue sharing. **Standard errors** are computed by bootstrapping for the descriptive treatment and control conditions. Standard errors for the unadjusted difference and OLS fixed-effects models are the standard deviation of the randomization distribution assuming the sharp null hypothesis. **p-values** are one-way tests based on randomization inference for the unadjusted difference and fixed-effects models in the hypothesized direction. **FE OLS** includes block fixed-effects as pre-specified. For non-dispersed Complete outcome, not enough observations are available to estimate the pre-specified fixed-effects model.

could not be verified as having been supported by revenue sharing, in both the treatment and control villages. This result falls against the backdrop of specific guidance within revenue-sharing guidelines that all items procured under the program should be labeled to allow for auditing and verification. Yet because very few of the projects were labeled as required, it is almost impossible to visually verify the delivery of revenue sharing funds at all, let alone verify that the full amount of funds was used for approved purposes.

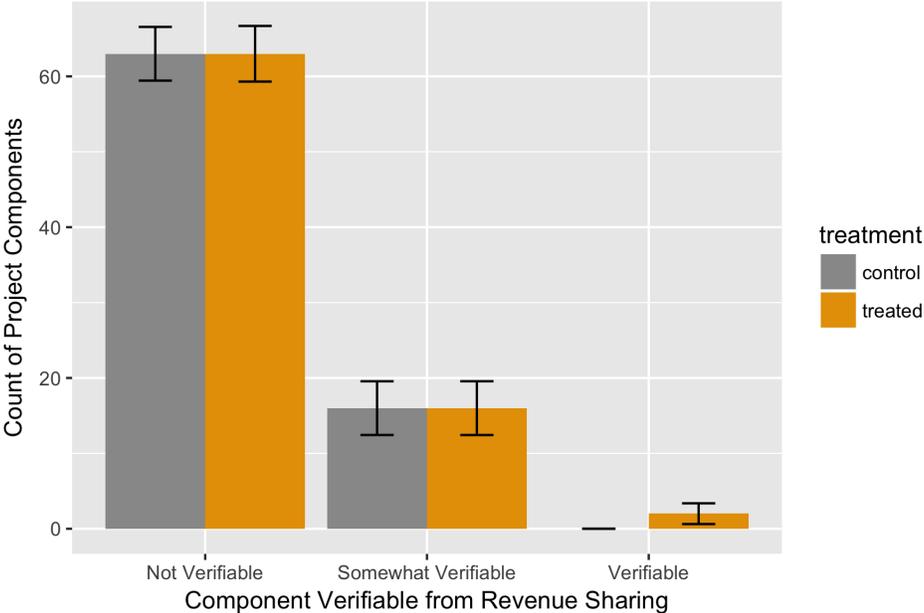


Figure 4: **Proportion of non-shared projects that can be verified as coming from revenue-sharing during field audits.** Not verifiable means no physical evidence is available linking project component to revenue sharing. Somewhat verifiable means that limited physical evidence (e.g., labels, markers) is available linking project component to revenue sharing. Verifiable means that projects as observed in the field can be definitively linked to revenue sharing.

Resident Audits While conducting field audits, we also conducted in-person survey interviews with at least 20 residents in each of the treatment and control villages, sampling within villages using a random walk protocol. As part of these interviews, we asked interviewees whether they had observed revenue-sharing projects implemented in their village. We also asked that they physically show us evidence of a revenue-sharing project that they knew about, partly as a check on the audits done with village leadership and described above. As displayed in Table 2, we fail to find a

difference in the proportion of residents who reported having observed a revenue-sharing project being implemented between treatment and control villages. We also fail to find a difference in the proportion of residents who are able and willing to show us evidence of projects. Our team did not record more photographic evidence of projects in treatment villages. Overall, the results of the citizen-audit confirm that there is no observable difference in citizen perceptions about implementation or physical evidence about implementation between treatment and control villages.

Table 2: Implementation of revenue-sharing projects as observed by residents

Condition	Project Implemented	Picture Shown	Willing
Treatment	0.870 (0.006)	0.537 (0.006)	0.612 (0.006)
Control	0.925 (0.007)	0.585 (0.007)	0.617 (0.007)
Difference	-0.055 (0.045) p=0.890	-0.048 (0.058) p=0.791	-0.005 (0.066) p=0.541
FE OLS	-0.055 (0.045) p=0.883	-0.036 (0.056) p=0.714	0.011 (0.064) p=0.436
N (respondents)	1895	1895	1895

Variables: *Project Implemented* is a binary indicator of whether the respondent reported seeing the project implemented. *Picture Shown* is a binary indicator of whether the respondent led the enumerator to physical evidence that they attributed to revenue sharing. *Willing* is a binary indicator of whether the respondent reported being willing and able to show evidence of a revenue-sharing project. **Standard errors** are computed by bootstrapping for the descriptive treatment and control conditions. Standard errors for the unadjusted difference and OLS fixed-effects models are the standard deviation of the randomization distribution assuming the sharp null hypothesis. **p-values** are one-way tests based on randomization inference for the unadjusted difference and fixed-effects models in the hypothesized direction. **FE OLS** includes block fixed-effects as pre-specified.

Resident Surveys While both the field and resident audits fail to uncover evidence that citizen monitoring improved the delivery of revenue-sharing projects, it is possible that monitoring had other effects on resident perceptions about the quality of implementation that cannot be measured

physically. Thus in addition to citizen audits, we also conducted a survey that asked residents a number of questions regarding revenue sharing specifically and satisfaction with the management of Bwindi National Park more generally. In Table 3, we show that there is no evidence that perceptions differ between residents in treatment and control villages on expected benefits from revenue sharing, perceptions about the value of benefits from revenue sharing, satisfaction with planning for revenue sharing, satisfaction with the implementation of revenue sharing, satisfaction with revenue sharing generally, satisfaction with the management of Bwindi National Park, and the perceived importance of protecting Bwindi National Park. Consistent with the audits, we find no evidence that the treatment caused changes in relevant attitudinal measures related to revenue sharing.

Follow-up interviews with Chief Administrative Officers

Perplexed by the results reported above, we conducted interviews with each of the Chief Administrative Officers and other district officials with a responsibility for oversight of revenue-sharing projects. In each district, we also interviewed elected and appointed sub-county officials, members of village- and parish-level project procurement committees that select contractors for projects, members of village project management committees, and elected village chairpersons. The list of interviews conducted is available in the Supporting Information, Appendix C. We designed semi-structured interviews to gather information on the broader constraints involved with implementing revenue-sharing projects and any specific actions that were taken in response to the reports that UWA delivered to the CAOs' offices as part of treatment. These interviews reveal the institutional structures associated with oversight for revenue sharing and the challenges of using platforms like the Bwindi Information Network to overcome governance challenges.

Bwindi Information Network All three Chief Administrative Officers in office at the time that the Bwindi Information Network was used to monitor the implementation of revenue-sharing project indicated that they had not personally seen the reports that were hand delivered to their

Table 3: Residents' attitudes about revenue sharing and Bwindi National Park

Condition	Beneficiary	Benefits	Planning	Implementation	BNP	RS	Conservation	Valuable
Treatment	0.811 (0.006)	0.867 (0.009)	1.903 (0.007)	1.985 (0.007)	3.369 (0.007)	3.257 (0.006)	1.887 (0.006)	2.840 (0.006)
Control	0.810 (0.007)	0.871 (0.010)	1.946 (0.007)	2.023 (0.007)	3.380 (0.007)	3.213 (0.007)	1.891 (0.007)	2.790 (0.007)
Difference	0.001 (0.052) p=0.513	-0.004 (0.041) p=0.536	-0.044 (0.109) p=0.619	-0.038 (0.106) p=0.607	-0.011 (0.102) p=0.538	0.044 (0.137) p=0.356	-0.004 (0.023) p=0.557	0.050 (0.042) p=0.106
FE OLS	0.007 (0.052) p=0.447	-0.003 (0.042) p=0.516	-0.030 (0.110) p=0.563	-0.022 (0.107) p=0.545	-0.000 (0.101) p=0.502	0.080 (0.135) p=0.249	-0.002 (0.024) p=0.534	0.059 (0.042) p=0.063
N (respondents)	1895	1794	1889	1889	1885	1895	1894	1892

Variables: See SI Appendix C for exact survey items. *Beneficiary* (5a) measures whether the resident was formally listed as a revenue-sharing beneficiary. *Benefits* (5b) measures whether the resident had or expected to benefit from revenue sharing. *Planning* is satisfaction with planning for revenue sharing (0, very dissatisfied - 3, very satisfied). *Implementation* is satisfaction with implementation of revenue sharing (0, very dissatisfied - 3, very satisfied). *BNP* is satisfaction with management of Bwindi National Park (0, very dissatisfied - 4, very satisfied). *RS* is satisfaction with revenue sharing (0, very dissatisfied - 4, very satisfied). *Conservation* is agreement with the importance of protecting Bwindi (0, not very important - 2, very important). *Valuable* is perception of whether benefits from revenue sharing are valuable (0, not at all - 3, very valuable). **Standard errors** are computed by bootstrapping for the descriptive treatment and control conditions. Standard errors for the unadjusted difference and OLS fixed-effects models are the standard deviation of the randomization distribution assuming the sharp null hypothesis. **p-values** are one-way tests based on randomization inference for the unadjusted difference and fixed-effects models in the hypothesized direction. **FE OLS** includes block fixed-effects as pre-specified. For non-dispersed Complete outcome, not enough observations are available to estimate the pre-specified fixed-effects model.

district office by a Uganda Wildlife Authority ranger or warden. A total of four reports were delivered to their office and confirmed by UWA as having been delivered. Interviewee **A** was careful to note that while he had not personally seen the reports and did not have knowledge about them, it was possible that another staff member in his office had seen them. Interviewee **B** also stated the potential importance of the reports to his office, even though he had not personally seen them or been informed about their existence. Interviewee **C** indicated that his assistant had informed him about the receipt of the report from UWA, but that he had not personally looked them over. Interviewee **C** stated, "I was told about these reports from Bwindi by my assistant, who told me there was nothing big to attend to." He also complained about the burden of reading a report with small fonts and noted "when someone is busy, they become lazy to read these small fonts."

Our partners at UWA dispute these accounts, stating that CAOs were personally informed about the reports in both phone calls and in-person meetings. Our partners at UWA state that they received acknowledgement from the CAOs upon delivery of the reports. Our research team participated in the delivery of some reports to the offices of the CAOs, but we never independently observed the reports being directly handed to the CAO by an UWA ranger. Regardless, it is clear that the efforts at making information from citizens accessible to officials with a responsibility for oversight was not successful at generating sufficient attention or responsiveness. This finding maps onto related research that shows citizen monitoring cannot make unresponsive officials responsive ([Grossman et al., 2018](#)) and related research showing that information will often be disregarded by officials when it lacks salience ([Callen et al., 2016](#)). In the framework of [Kumar et al. \(2018\)](#), the information that the treatment disseminated leaked before it was registered for action.

An even stronger interpretation of what happened, one that we are not in a position to verify directly, is that CAOs actively avoided the information in the reports so as not to become individually responsible for addressing problems. This interpretation is consistent with the reports from our UWA partners about their specific outreach and confirmation that reports reached the CAOs.

Applying oversight District officials distinguished between financial oversight and implementation oversight, and highlighted their limited capacity and interest in getting involved with implementation. At the district level, the main responsibilities of the Chief Administrative Officer and related district officials is to ensure that funding is appropriately transferred and managed within the official accounting system of the districts. Two Chief Administrative Officers (**A** and **B**) indicated that their main responsibility was to oversee the accounts, while they indicated little ability to oversee the implementation of projects outside of what would be reflected in official accounts. Interviewee **A** indicated that his office did not have any means of transport to check on implementation in the field and, even if he did, it would not be easy because of the long travel times needed to reach many of the villages that are part of the revenue-sharing program. He stated that he had ensured all of the funds had been transferred properly from district accounts.

Interviewee **B** stated that there is no standard procedure for audits or oversight of the implementation of revenue-sharing projects. His office and other district officials must wait for reports from lower-level officers or complaints from people to exercise oversight. He stated, “apart from the communities raising alarm, we can’t know that things are going wrong.” This was clearly what the Bwindi Information Network was attempting to achieve. He additionally stated that although five percent of revenue-sharing funds are set aside as resources for monitoring from the district, these funds are insufficient to allow for any kind of real oversight of implementation in the field.

Interviewee **C** indicated that his office provides monitoring for all district programs together and that there was no special monitoring put in place for revenue sharing. He indicated that he was not made aware of any complaints from citizens regarding the implementation of revenue sharing and particularly about the actions of sub-county officials in his district. His general opinion was that revenue sharing had been implemented very well within his district, though he did state that corruption is a common concern at all levels and needs to be carefully guarded against through oversight, mostly involving information from lower-level officials and citizens, as with all oversight conducted at the district level.

Citizen monitoring Indeed, all of the Chief Administrative Officers who we interviewed reported relying on information from citizens for oversight. The interviews indicated the uneasy role that citizen monitoring of project implementation might play in improving the delivery of revenue sharing projects. One Chief Administrative Officer (Interviewee **A**) indicated that technology was likely to be key to overcoming oversight challenges, stating that it was too slow to have UWA hand-deliver reports about the status of revenue sharing projects. He indicated that more government business needed to be completed by email and other electronic forms of communication, including receiving more real-time information about the status of project and any complaints that came up about projects. However, when presented with copies of the reports that were produced using near real-time information from the Bwindi Information Network, he complained that he had a stack of such reports on his desk and did not have time to consider them. He stated that in-person stakeholder meetings should have been called if the information about the reports needed to be disseminated. These conflicting responses highlight the tension between the aspirations of using technology to assist with oversight on the one hand and the desire to avoid specific responsibility for new kinds of information on the other.

Both of the other Chiefs Administrative Officers (interviewees **B** and **C**) indicated that they respond to complaints from citizens when deciding how to allocate effort at oversight. However, neither paid much attention to the reports that compiled information directly from citizens, perhaps indicating that they perceived the reports to be generated by the Uganda Wildlife Authority and the staff at Bwindi National Park. Future research should consider carefully the kinds and sources of information that are most likely to activate specific responsibility from officials, perhaps by making the complaints delivered publicly to heighten responsibility to respond.

Follow-up interviews with local officials

While the citizen monitoring intervention did not impact the delivery of projects, interviews with other local officials revealed that our treatments may have had positive impacts beside those that we systematically measured. Indeed, our interviews revealed three instances where the information

about the approved project and funding amounts sent to residents as part of treatment ultimately encouraged residents to seek accountability from officials through other channels. In each of these cases, there is credible evidence that the receipt of information we provided about what should happen with revenue-sharing caused residents to complain when it became clear that officials at the subcounty level were acting inappropriately. Government officials, particularly those at the district level, took actions that reflect increased accountability even if they did not result in successful implementation of projects. The districts' responses to these complaints included the firing of one sub-county chief and transferring another for engaging in irregularities. While there is limited evidence that these complaints have been able to redress the harms caused by irregularities in administration, transparency did set in motion claims for accountability that involved real punishment of wayward officials. This is an encouraging outcome that shows the promise of transparency for accountability. Still, transparency alone does not provide accountability but rather requires the cooperation of supporting institutions to act as a result of new information. While we compile information about these events from multiple interviews (Interviews E-U) in all cases, we do not reveal the sources of specific pieces of information to protect the anonymity of local officials who provided interviews.

Cash Instead of Goats Villagers in Kashekyera received messages informing them that they would receive goats for an animal husbandry project and how much money would be spent in procuring these goats. One evening, the subcounty chief came to Kashekyera village and other villages in the sub-county without any UWA staff and tried to get villagers to accept cash rather than goats. He told villagers that the goats were sick and offered beneficiaries less money than that allocated to pay for the goats. Specifically, the cost of each goat was calculated to be 150,000 UGX. The subcounty chief told beneficiaries in the county that they would get 30,000 UGX each. Some beneficiaries took the money, and some did not. Those who refused were told that if they did not take the money they would not receive anything as part of revenue sharing.

A subset of villagers, based on the information they had learned from the messages were able

to identify the difference in funds allocated to their village as opposed to that offered by the sub-county chief.

Those in Kashekyera contacted UWA staff to complain. The way the complaint was couched was that (1) they had received messages, (2) the messages said to expect goats and that a certain amount of money would be spent in procuring the goats, and (3) instead the sub-county chief had tried to get them to accept a lesser amount of money. UWA told the villagers to contact the Chief Administrative Officer (CAO) at the district and to copy UWA on the complaint. Ultimately, with the help of a community conservation ranger, the villagers wrote the District CAO, copied the district chairman, the sub-county chairman, and the UWA Park Warden. At the date of our interviews, the villagers still had not received a response about the funds that are supposed to provide goats.

The complaint did spur action, however. After receiving the complaint, the district officials asked UWA leaders, the sub-county chief, and the sub-county chairperson to meet. The sub-county chief denied the story. The district CAO insisted the the whole group go and visit the beneficiaries to find out what had happened. When they arrived the beneficiaries told the CAO, "We have received messages. They told us what was happening. They even told us to complain to you." They pointed at the sub-county chief and explained how they were told to take money or risk getting nothing.

Later on, they sent another letter complaining about the problem animal management project. That project was never completed and the money for the project was missing.

The district CAO took the sub-county chief to the disciplinary committee. The district attempted to fire him. Ultimately, the sub-county chief challenged this decision, and his punishment was settled at suspending him for a number of months and then transferring him. In doing so, it was specified that the sub-county chief would be transferred to a place without revenue sharing so that this could not happen again.

Shorting a Village Revenue-Sharing Funds In Kahurire village, UWA had allocated 23,000,000 UGX for revenue sharing projects, and the village had this confirmed in messages received from the Bwindi Information Network. The subcounty chief told Kahurire village only to expect 15,000,000 UGX. Apparently, the subcounty chief had planned to send the additional 8,000,000 UGX to a different village in the subcounty to help fund a new school building. It was suspected by locals, that the subcounty chief would somehow personally benefit from providing another village more funding.

Because the amount and project differed from that they were told to expect, the villagers decided to contact UWA. They called UWA. Though it is not clear from our interviews whether UWA forwarded the complaint or whether local communities complained to the district, the sub-county chief's attempt to reduce Kahurire's revenue-sharing allocation was brought to the district's attention. Based on this interaction, the district CAO ended up firing the subcounty chief. It also appears from our interviews that the funding was ultimately made available for Kahurire's revenue sharing project.

Advance Payment to Missing Contractor Five villages in Buremba Parish requested to pool their revenue-sharing funds to build a tourism center. The tourism center would be built near a health center that a contractor had started but not finished. The subcounty chief opted to use the same subcontractor who had started to build the health center to build the tourism center. The subcontractor determined he would finish the health center instead of building the tourism center. It is unclear whether this decision to finish building on the health center had its genesis with the subcontractor alone or with the subcounty chief as well.

The messages sent to villages receiving treatment messages in the parish told the villagers that revenue sharing funds were allocated for a visitor center along with the amount of funds allocated. Using the message as a way to frame their dissatisfaction, the villagers complained to the subcounty that the messages said they should get a visitor center, not a health center.

The subcounty chief said, the finished health center would have to suffice as the visitor center.

The local people found this answer upsetting. These buildings were meant to be distinct buildings, and regardless the dimensions and design of the health center would not suffice for the purpose of a tourism center. The villagers refused to accept this answer and decided to take additional action.

Villagers made an initial contact with UWA and confirmed with UWA that the messages they had received were correct. UWA confirmed this.

The villagers tried to put further pressure on the subcounty chief to make the contractor build the tourism center, but nothing happened. The villagers then filed a complaint with UWA. The villagers were told to write and complain as well to the District CAO. They did. Based on the complaint, the district auditor initiated a review.

By that point in time, the subcounty had already released 7,000,000 UGX for work the contractor had completed towards a health center and had released another 10,000,000 UGX in advance for work to be done. As the district investigated, the subcontractor fled the subcounty, and the work remains undone. The balance of remaining funds is still on the account of the subcounty, and the villagers are trying to sort out what to do next.

Discussion

We expected that citizen monitoring could be used to increase specific responsibility for addressing the mismanagement of public funds for high-level officials in positions of authority. We partnered with a national agency to disseminate information in a way that would heighten the sense among officials that specific problems are common knowledge and that those problems are the specific responsibility of the targeted official to fix. Our expectations were based on the emerging evidence that citizen monitoring of governments is unlikely to shape governance unless it produces information that is used by actors who have the resources and authority to oversee and punish corruption and elite capture, but also the incentive to do so. In contrast with other types of community monitoring interventions, the voice-response system that we tested has the potential to vastly expand knowledge of specific, actionable problems among officials who formerly had only diffuse responsibility for oversight and management of public funds. Indeed, research in other contexts shows

the potential for institutional designs that link local people with powerful auditors to achieve better accountability ([Buntaine, 2015](#)).

In the experiment, the Chief Administrative Officers that received the reports as part of treatment did not pay attention to them. The Chief Administrative Officers that we interviewed had never seen the reports and did not have knowledge about them. From a research perspective, this is a disappointing outcome, since it might be interpreted as "failure to treat," rather than a good test of overcoming diffuse responsibility and creating specific responsibility by leveraging new technologies to have citizens share their knowledge of specific problems.

We believe a more accurate interpretation of the outcome, in light of the information that we collected from our UWA partners about their outreach efforts, is that the CAOs disregarded the information as a strategy to avoid specific responsibility. We did not anticipate this kind of strategic response to the treatment when we designed the study, but it speaks to the need to carefully craft such treatments to context in order to make specific responsibility unavoidable. We had hoped this would be accomplished because we partnered with a national agency that did all of the dissemination work as part of the experiment. Ultimately, future testing will be necessary to establish the strategies that could reasonably work in different contexts to create specific responsibility within bureaucracies. Given related evidence on the negative impacts of diffuse responsibility for governance ([Gulzar and Pasquale, 2017](#); [Schwindt-Bayer and Tavits, 2016](#); [Tavits, 2007](#)). We cannot entirely rule out that the officials targeted with information were instead overburdened with information and had limited capacity to respond to information, so future designs of this type will need to carefully consider not only strategies to heighten specific responsibility, but also consider the resources available to bureaucrats to carry out their responsibilities.

More positively, we identified three instances where the receipt of information about approved projects and project amounts by villages lead to claims for accountability by citizens and responses from the officials who we had targeted with the treatment. These claims have not yet yielded better delivery of revenue sharing projects, but they have nonetheless resulted in meaningful oversight actions that put officials in the area on notice about the punishments that are possible when revenue

sharing funds are managed poorly. Over time, this kind of accountability response may lead to the more effective delivery of project. Indeed, when we talk informally to local people enrolled in the program about their experiences, they often report that the most impactful part of the Bwindi Information Network was the provision of information about the approved project and amount of funding approved, information that allowed people to know about problems and ask the right kinds of questions and lodge the most appropriate complaints.

This result of the field experiment and interviews reflects on a bigger question related to governance and public administration: when and why officials and politicians will use information about the performance of public agencies? While a basic question, limited empirical evidence is available about the attributes of officials, their institutional settings, the incentives tied to their job performance, and the types of information that will increase the performance of the public sector (Moynihan and Pandey, 2010). Recently, audit and list experiments have been used to identify the kinds of information sources and demands that receive greater responsiveness from public officials (e.g., Chen et al., 2016; Meng et al., 2017). And recent experimental evidence suggests that making knowledge of monitoring salient to public officials can be important for improving the effectiveness of public monitoring approaches (Muralidharan et al., 2018), an approach that we did not take in this study. These kinds of studies offer a promising direction for understanding sources of government responsiveness to citizens. We believe that future work should carefully consider how such information generates responsibility to act based on the position and incentives of officials.

Implications for Institutional Design

More broadly, however, the results of this experiment indicate that the institutions of revenue sharing, as currently structured, are unlikely to yield accountability for the people who live near Bwindi National Park because of a high level of diffuse responsibility. The funds from tourism pass through multiple layers of government and no single office or level of government takes primary responsibility for their implementation. Recent research has shown there to be significant

problems of performance when responsibility for public programs is diffuse (Gulzar and Pasquale, 2017). More broadly, research shows that decentralization and the administration of projects by local governments does not necessarily take advantage of the informational advantages of citizens to produce accountability (Devas and Grant, 2003).

Compounding these problems, the projects that are delivered with revenue-sharing funds can almost never be verified in the field, raising problems for accountability even if responsibility for delivery can be effectively concentrated. When politicians and officials know that it will be easier to divert the funds because they cannot ultimately be tracked, incentives to engage in activities that misdirect the funds increase. When officials are able to point fingers for failures at other levels of government, the possibility for a strong accountability response becomes unattainable. Institutional reforms that concentrate responsibility and limit opportunities for diversions are needed.

Cooperating with UWA on this research has allowed for learning both by the research team and UWA staff. Being able to access the knowledge of UWA staff about what is happening on the ground has made understanding research results easier. The results of this study have also already become part of a larger discussion about redesigning the revenue sharing guidelines for all national parks in Uganda. Our research team has presented the results of this study to the senior management of the Uganda Wildlife Authority in Kampala and participated in related discussion about possible revisions to guidelines that the results of this study suggest are necessary. We have learned a number of lessons about institutional design through partnership that can be translated directly into decisionmaking, which we will flag now.

First, the lack of an ability to verify the delivery of revenue-sharing projects is a major challenge for holding officials accountable for good practices. As reported in Figure 4, almost none of the projects delivered can be physically tracked after they are implemented. These problems are most severe for projects that deliver private goods (e.g., goats), rather than projects that deliver common goods (e.g., water tanks). To stem this basic problem of verification, we have recommended that guidelines be revised to require projects that provide common goods. Our interviews with local officials suggest a large degree of local support for this idea, though it is not universal.

Alternatively, it may be possible to use new technologies to track expenditures and deliver them directly to beneficiaries, thereby reducing leakage (see [Muralidharan et al., 2016](#)).

Second, the responsibility for management and oversight of revenue-sharing is very diffuse, resulting in many officials blaming others for failures in delivery. While the district has ultimate oversight of the revenue-sharing projects, it is a distant entity and the offices of the chief administrative officers handle many matters. Most accountability failures seem to arise at the sub-county level, even the sub-county officials we interviewed were generally willing to concede this. Despite this, the sub-county are shielded of direct responsibility from UWA because they sit below the districts, and our conversations with district officials suggest that the districts are often unable to actually monitor the implementation of projects, but due to time and travel constraints often end up focusing on financial oversight and relying on complaints to ferret out problems on the ground. In the future, UWA should prioritize finding ways to hold sub-county officials accountable for their decisions in the delivery of revenue-sharing more directly.

Third, the current process of procuring the goods and services required to deliver revenue sharing projects requires redesign. Based on the guidelines, village procurement committees should arrange to receive bids and select contractors. The sub-county chief approves disbursements to contractors on the recommendation of these procurement committees and evidence that goods have actually been delivered. In practice, village procurement committees are often made up of illiterate members who do not have the technical expertise to judge the merits of different contractors. This means that they are often subject to bribes for selecting certain contractors or rely on the advice of the sub-county chiefs, who may themselves receive kickbacks for recommending certain suppliers. Additionally, payments to contractors are often difficult for sub-county officials to oversee, since they are supposed to rely on the local procurement committee for authorization to release funds. Better technical oversight of the procurement process is needed, for example by requiring a district technical advisor to additionally sign off on contracts, to prevent the kinds of abuses that we uncovered through our interviews.

The partnership that provided the basis for this project and was instrumental for the design of

the treatment has allowed these kinds of lessons to become part of the ongoing conversation about institutional design among key government decision makers. Even though the treatment effects of citizen monitoring is null, the research has proven helpful. The partnership has highlighted to those in government the importance of confronting the challenges that made research difficult, such as the need to make projects verifiable, to guard against corruption, and to alter government institutions to deal with the challenges of diffuse responsibility in more effective ways. From a research perspective, leveraging what was known by government officials allowed us to better track the diverse ways the sorts of accountability mechanisms made possible by treatment came into play, as the stories we uncovered in post-treatment interviews illustrate. Indeed, our partnering agency remains very positive about this research and continues to insist that the research has had multiple positive effects, just effects that are hard to measure with the data we were able to collect. Regardless, the very act of trying out a new kind of intervention has both revealed the sources of many governance problems and opened a new space to consider institutional designs that will solve the problems of accountability and diffuse responsibility that persist with revenue sharing.

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Supporting Information

Contents

A	Descriptive Statistics	41
B	Example report summarizing citizen monitoring	42
C	List of semi-structured interviews with officials	43
D	Audit and survey protocol	45
E	Spillover	56

A Descriptive Statistics

Table A1: Subject-wise descriptive statistics from surveys

Statistic	N	Mean	St. Dev.	Min	Max
Listed Beneficiary	1,854	0.81	0.39	0	1
Expect to Benefit	1,753	0.87	0.34	0	1
Satisfied with Planning	1,849	1.92	0.81	0	3
Satisfied with Implementation	1,849	2.00	0.77	0	3
Satisfied with BNP Management	1,844	3.37	0.85	0	4
Satisfied with Revenue Sharing	1,854	3.24	0.90	0	4
Importance of Conserving BNP	1,854	1.89	0.32	0	2
Revenue Sharing Valuable	1,853	2.82	0.41	0	3
Choose Project Again	1,854	0.54	0.50	0	1
Age	1,854	41.32	15.14	18	100
Female	1,854	0.47	0.50	0	1
Monthly Income (UGX)	1,854	57.80	77.24	10	750
Fully Literate	1,854	0.24	0.43	0	1
Bwindi Info Network Member	1,854	0.30	0.46	0	1

B Example report summarizing citizen monitoring

The following provides an example of one page of the typical report that the Uganda Wildlife Authority delivered to the Chief Administrative Officer in each district.

District Summary Statistics

Below we summarize the answers of the 25 villages in Kanungu District. For each village, we have **shaded the boxes** where less than half of the respondents indicate **a negative outcome**. We have *italicized the data in the boxes* where respondents altered their response from the previous report enough to change the collective response *from a positive to a negative outcome*. We have underlined the data in the boxes where respondents altered their response from the previous report enough to change the collective response from a negative to a positive outcome.

Note that one reason that we might see some villages moving from positive to negative in this report particularly is because we clarified the question we were asking to better differentiate between completed projects and those in progress.

	Completed Successfully (if as approved)	Reasons Not Completed As Approved	Satisfied with Project (any project)
Butogota Town Council			
Kanyabuhama	3 / 7	Not Started: 2 / 3 Short Funding: 1 / 3	1 / 3
Kanungu Town Council			
Butare	5 / 7	Not Started: 1 / 2 Short Funding: 1 / 2	2 / 6
Omumbuga	<u>7 / 10</u>	Short Funding: 1 / 3 Still in Progress: 2 / 3	3 / 8
Kayonza			
Buhoma	4 / 12	Not Started: 1 / 7 Still in Progress: 5 / 7 Different Project: 1 / 7	7 / 10
Iraaro	1 / 3	Not Started: 1 / 1	0 / 1
Kacerere	<u>7 / 14</u>	Not Started: 2 / 7 Still in Progress: 4 / 7 Different Project: 1 / 7	3 / 10

Figure B1: Example of report delivered to Chief Administrative Officers

C List of semi-structured interviews with officials

- (A) Chief Administrative Officer, 16 May 2018
- (B) Chief Administrative Officer, 23 May 2018
- (C) Chief Administrative Officer, 1 June 2018
- (D) Senior Bwindi National Park staff, 12 June 2018
- (E) Sub-county Chief, 26 July 2018
- (F) Village Chairperson, 26 July 2018
- (G) Village Chairperson, 27 July 2018
- (H) Sub-county Chief, 27 July 2018
- (I) Sub-county Chief, 27 July 2018
- (J) Vice-chair of parish procurement committee, 28 July 2018
- (K) Village Chairperson, 28 July 2018
- (L) Sub-county Chairperson, 28 July 2018
- (M) Village Chairperson, 30 July 2018
- (N) Sub-county Chairperson, 30 July 2018
- (O) Member, Parish procurement committee & Village management committee, 30 July 2018
- (P) Sub-county Chief, 30 July 2018
- (Q) Village Chairperson, 31 July 2018
- (R) Vice-chair, Village procurement committee, 31 July 2018
- (S) Sub-county Chief, 31 July 2018

(T) Sub-county Chairperson, 31 July 2018

(U) Senior Bwindi National Park staff, 1 August 2018

D Audit and survey protocol

The document below is an exact copy of the training materials provided to enumerators and describes all of the data collected as part of fieldwork.

ENDLINE PROJECT AUDITS FOR BWINDI

UWA's Bwindi National Park announced and shared this year's (2016/17) revenue sharing funds to 94 villages that surround the Park in May. Different villages met and planned for project with the funds according to their allocations and selected different projects. Some projects selected were to benefit individuals while others were common-good projects like water systems or roads. After funds were dispersed, the implementation (including procurement) of the projects happened at the division, subcounty, and village levels.

The Bwindi Information Network has also for the last several months been sending out a request for reports about the status of revenue-sharing projects to 46 villages that surround Bwindi National Park. The polls taken by voice call allow village residents to report on the progress of revenue-sharing projects in their villages. The survey questions were asking the citizens whether or not they had seen any project being implemented in their villages, whether the project had been implemented as approved and how satisfied they were with their village's revenue sharing project of the year. Reports using these data were delivered by UWA to the Chief Administrative Officers of the three districts around Bwindi. The aim of these deliveries was to alert to most important administrative officer to problems in implementation while time was available for a response and to sort of irregularities.

We therefore intend to visit 94 villages that surround the Bwindi National Park and have shared this year's revenue sharing funds. The purpose of the visits is to find out how closely the implemented projects align with what UWA had approved for the villages and whether making reporting experimentally available to citizens increased the delivery of projects to villages.

The exercise is planned to begin in the mid-week of November 2017 (in accordance with UWA's timeline) and completed within 10 days (assuming the team covers 10 villages in a day). A team of 10 people will visit 10 villages each day using two cars (2 people visiting a village in the morning and another in the afternoon). This means the villages to be worked in shall be relatively close to each other or in the same zone. For villages that are distant from Buhoma, accommodation shall be provided in addition to meals, airtime and remuneration. The team shall also be asked to take some pictures during their field visits. The whole exercise is budgeted to cost approximately 16 million shillings (4572 USD).

OVERVIEW

The research team shall enter the village with a prior knowledge on which project was approved and the beneficiaries (whether individual or common project). The team will then conduct a physical audit of the approved revenue sharing program.

After completing the audit, the team interviews at least 10 people on the beneficiary list while other 10 people shall be got by random walks. Assuming that the project provides a collective good (e.g., a well), the random walk will be used to identify 20 beneficiaries. Therefore 20 formal interviews shall be conducted in each village however, more interviews can be done with local/project leaders, unintended subjects among others to give more evidence. The

enumerators may also use Local leaders or CCRs to confirm some observations as indicated in the protocol below.

Upon entering a village, the enumerators should first try to make contact with the LC1 chair, with a request that this individual guide the enumerator in recording evidence of the project. The LC1 chair may delegate a guide if appropriate. To the extent that the LC1 Chair is not available, members of the project management committee should be sought for this task.

PHYSICAL AUDIT

During the visits, the enumerators should take time to observe the following:

1. Is there **physical evidence** that the project was at least partially implemented? Check all the items that are observed. Record a photograph of the item and write a detailed description.
 - a. Tagged goat / sheep / piglets / hens
 - b. Newly constructed or graded road
 - c. Newly constructed water source
 - d. Newly constructed pit latrine
 - e. Problem Animal Management items — pangas and hoes
 - f. Sign posts
 - g. Constructed or rehabilitated community health center
 - h. Constructed or rehabilitated school or school facilities
 - i. Constructed or rehabilitated community house or center
 - j. Constructed or rehabilitated tourist facility
 - k. Plastic seats
 - l. Culverts
 - m. Community camp
 - n. Planting of edge crops for PAM
 - o. Solar lamps
 - p. Other [fill out reason]

[take photographs and notes to record as much evidence as possible]

2. Had the project been implemented as planned, what proportion of physical outputs that would have resulted are currently observable:
 - a. **Complete evidence** (almost all of the physical outputs that would have been produced by a completed project is available and recorded, 90-100%)
 - b. **Mostly complete evidence** (a majority of the physical outputs that would have been produced by a completed project is available and recorded, 60-90%)

- c. **Partially complete evidence** (about half of the physical outputs that would have been produced by a completed project is available and recorded, 40-60%)
 - d. **Mostly incomplete evidence** (a majority of the physical outputs that would have been produced by a completed project is not available and only a small amount is recorded, 10-40%)
 - e. **No or very limited evidence** (no or very little physical output is available that indicates the project was completed, 0-10%)
3. How objectively verifiable is it that the evidence comes from this cycle of the revenue sharing program (as opposed to from some other source)?
- a. **Verifiable** (objective evidence show it is all or mostly from the program)
 - b. **Somewhat verifiable** (some objective evidence exists, but it is not certain that all of the physical outputs come from the program)
 - c. **Not verifiable** (any physical evidence that exists requires taking the word of people on the ground about being from the revenue sharing program)
4. What reasons do the LC1 or members of the Project Management Committee give for why physical evidence may have existed previously, but is no longer available for observation? (check all that apply)
- a. Project was not delivered or only partially delivered
 - b. Project budget was insufficient to carry out planned project
 - c. Project was changed to one not approved
 - d. Livestock/animal sold or died
 - e. Road having been washed away by erosion
 - f. Labels removed or destroyed
 - g. Poor labels or lack of labels on delivery
 - h. Other [fill out reason]

[create a detailed, written log about all observations in the village]

SURVEY WITH RANDOM RESIDENTS

The enumerators should conduct surveys with 10 representative individuals from each villages, with the goal of generating a representative account of this years' revenue-sharing program. The questions mirror the kinds of questions that were asked as part of the Bwindi Information Network over the past several weeks.

To minimize bias the survey responses, a random walk shall be used by the research assistants after completion of the physical audits. Each of the research assistants will be provided with a dice with at least four numbered sides which shall be tossed at every intersection in the village. An intersection may be a crossing of any road, path or alley inside the assigned village. An intersection might take several minutes to find in any given village. On reaching an intersection, the enumerator shall assign a number to each of the directions before tossing the die and shall walk into the randomly chosen direction. The research assistant shall only turn around after reaching a dead end or the end of the assigned village. Each random walk will last for three minutes (timing should be emphasised) between interviewees whom should also be selected using the given guidelines (beneficiaries vs non beneficiaries). We use a quota sampling technique that requires at least 10 beneficiaries and 10 non-beneficiaries are sampled in each village. To the extent that the village project is a public good that renders all residents beneficiaries, then 20 interviews with adults identified as a part of a random walk is acceptable. Assuming that the project provides a collective good (e.g., a well), the random walk will be used to identify 20 beneficiaries. The Project Manager will provide an indicative list of such villages prior to the enumeration effort.

Survey

Enumerator entry in Kobocollect based on respondent files:

- Enumerator name

My name is _____. I would like to ask you several question about your opinions of Bwindi National Park and its Revenue Sharing program. The goal of the survey is to understand people's experiences with the Revenue Sharing program this year, including both the planning for project and the implementation of projects. Your participation is strictly voluntary and your individual answers to the questions will never be disclosed to anyone. You can skip any and all questions that you do not want to answer. We will never share your individual answers with anyone, including the Uganda Wildlife Authority or local leaders. If you complete this survey, we will give you 1000 shillings, though you can still skip any questions you do not want to answer. May we ask you a few questions?

- 1) Do you voluntarily agree to participate in the survey?
 - a) Yes
 - b) No
- 2) What is your first name?
- 3) What is your mobile phone number?
 - a) Number _____

- b) No mobile phone
- c) Refused

E6) What is your gender?

- a) Male
- b) Female
- c) Refused

E7) What is your age? [enter number]

E8) What is your approximate monthly income?

- a) 20,000 shillings or less
- b) 20,000 - 100,000 shillings
- c) 100,000 - 200,000 shillings
- d) 200,000 - 500,000 shillings
- e) 500,000 - 1 million shillings
- f) 1 million shillings or more
- g) Refused

E9) Can you read?

- a) No, I cannot read at all
- b) No, but I have a close family member who can read
- c) Yes, I can somewhat read
- d) Yes, I can read very well
- e) Refused

4) Did you receive messages through the Bwindi Information Network over the last several months?

- a) Yes
- b) No
- c) Refused

5) Were you designated as a beneficiary of this year's revenue-sharing project in your village?

- a) Yes
- b) No (If "no", ask for an introduction to a beneficiary at the end of the survey)

6) UWA has approved for <<<village>>> to spend its revenue sharing funds on <<project>>. <<village name>> was allocated shs <<amount>> for <<project>>.

- 7) Have you seen this project completed in your village since June of this year?
- Yes
 - No
- 8) [If NO] What is the reason why you have not seen the revenue sharing project completed?
- No project has been started
 - Started and is still in progress
 - Village has received less than described but the project is finished
 - The project delivered is a different than described
 - Other [allow for self description]
- 9) [If different project] Describe the different project that has been implemented.
- 10) Has the different projected been completed?
- Yes
 - Still in progress
- 11) Overall, how satisfied are you with the implementation of this year's Revenue Sharing project, not taking into account planning of the project?
- Very Dissatisfied
 - Somewhat Dissatisfied
 - Somewhat Satisfied
 - Very Satisfied
 - Refused to answer
- 12) Overall, how satisfied are you with the planning of this year's Revenue Sharing project, not taking into account implementation of the project?
- Very Dissatisfied
 - Somewhat Dissatisfied
 - Somewhat Satisfied
 - Very Satisfied
 - Refused to answer
- 13) Would you choose the same project again given how it was planned and implemented?
- Yes
 - No
 - Refused to answer
- B2) How satisfied are you with the overall management of Bwindi National Park?

- a) Very dissatisfied
- b) Somewhat dissatisfied
- c) Neutral
- d) Somewhat satisfied
- e) Very satisfied
- f) Don't know
- g) Refused to answer

B3) How satisfied are you with Bwindi National Park's Revenue Sharing Program?

- a) Very dissatisfied
- b) Somewhat dissatisfied
- c) Neutral
- d) Somewhat satisfied
- e) Very satisfied
- f) Don't know
- g) Refused to answer

B5) Have you or your family ever directly benefited from Bwindi National Park's Revenue Sharing Program?

- a) No
- b) Yes
- c) Don't know
- d) Refused to answer

B6) In your opinion, how important is it to protect the forest and wildlife in Bwindi National Park?

- a) Not at all important
- b) Not very important
- c) Somewhat important
- d) Very important
- e) Don't know
- f) Refused to answer

B11) How satisfied are you with your current opportunities to communicate with the Uganda Wildlife Authority about the Revenue Sharing Program?

- a) Very dissatisfied
- b) Somewhat dissatisfied
- c) Neutral
- d) Somewhat satisfied

- e) Very satisfied
- f) Don't know
- g) Refused to answer

B12) How much do you agree or disagree with the following statement: I know the right person [in my village or at UWA] to contact if I have concerns about the Revenue Sharing Program.

- a) Disagree
- b) Somewhat disagree
- c) Somewhat agree
- d) Agree
- e) Don't know
- f) Refused to answer

B13) In your opinion, how valuable are the economic benefits provided to your village through the Revenue Sharing program?

- a) Not at all valuable
- b) Not very valuable
- c) Somewhat valuable
- d) Very valuable
- e) Don't know
- f) Refused to answer

E1) The allocations from revenue sharing are distributed fairly among members of the village:

- a) Disagree
- b) Somewhat disagree
- c) Somewhat agree
- d) Agree
- e) Don't know
- f) Refused to answer

E3) Has corruption ever been a problem with your village's previous Revenue Sharing projects?

- a) Yes
- b) No
- c) No Reply

E4) Did you participate in any RS meetings during the last several months?

- a) Yes
- b) No
- c) No Reply

14) Would you like to receive notices through the Bwindi Information Network in the future?

- a) Yes
- b) No

15) Is there anything else you would like to tell us about living near Bwindi National Park or the Revenue Sharing program?

We would like to now ask you a few separate questions about alcohol abuse.

16) How much do you agree or disagree with the following statement?

Drinking alcohol is an important part of being a man.

- a) Strongly Agree
- b) Somewhat Agree
- c) Somewhat Disagree
- d) Strongly Disagree

17) What is the best way to overcome alcohol abuse?

18) How much do you agree or disagree with the following statement?

People do not need medical treatment for alcohol abuse because they can overcome alcohol abuse by making better choices.

- a) Strongly Agree
- b) Somewhat Agree
- c) Somewhat Disagree
- d) Strongly Disagree

19) How much do you agree or disagree with the following statement?

The hospital closest to me has good treatment programs for alcohol abuse.

- a) Strongly Agree
- b) Somewhat Agree
- c) Somewhat Disagree
- d) Strongly Disagree

Enumerator Notes (please make note of anything about the survey that the research team should take into account when considering the responses)

INFORMAL INTERVIEWS

In addition to the physical audit and surveys listed above, enumerators are encouraged to talk to the individuals that they encounter about the following kinds of questions. After leaving each village, enumerators should immediately record detailed notes about who they talked to and what their responses were to the following questions in a field log:

1. Do you think the amount allocated to your village this year was wholesomely used
2. Did the project actually benefit the intended people or group of people?
3. Is the person being asked a beneficiary in this year's project?
4. Was there any kind of corruption in this year's revenue sharing funds in your village?
(Mention an example if any)
5. If yes, are you happy with the project? If no, are you happy with this year's project?
6. Generally, how satisfied are you with this year's revenue sharing program?
7. If you were to choose a project for next year, would you choose the same project? If no, give reasons and suggestion on what you would select.
8. Can you give suggestions on how the program can be improved?

E Spillover

It is plausible that spillover between villages would complicate analyses through multiple channels. First, if monitoring and oversight were prompted by the treatment, it might be easy to oversee nearby control villages, especially if field visits were involved. This pathway would attenuate treatment effects. Second, it is possible that the presence of the treatment generally caused the districts to update their standard operating procedures and oversight measures everywhere, which would again attenuate treatment effects. Third, it is possible that knowledge of the treatment villages would cause the districts and their subordinates to re-allocate oversight effort away from control villages and toward treatment villages, which would amplify treatment effects.

To investigate the potential for spillover, as pre-registered, we consider the number of contiguous villages that are treated for each village. Because all villages are exactly contiguous with two villages and all villages have an equal probability of assignment to treatment, all villages have an equal probability of being exposed to spillover effects from a neighboring village according to this spillover model. Spillover was tested for by including a variable for the number of contiguous villages that were treated in the estimation of the outcome variables, and the results for the spillover analysis are included below in [Table E1](#).

Table E1: Implementation of project components recorded by field audits, considering spillover

	Finished (Implementation)	Approved Project	Complete (Non-dispersed)	Pictures (Dispersed)	Verifiable	Somewhat Verifiable
Treated	-0.137 (-0.422, 0.147)	-0.176 (-0.402, 0.051)	-0.500 (-1.589, 0.589)	-1.657 (-4.769, 1.455)	-0.018 (-0.053, 0.018)	0.043 (-0.106, 0.191)
S1	-0.076 (-0.305, 0.154)	-0.065 (-0.232, 0.103)	-0.071 (-1.246, 1.104)	0.695 (-2.250, 3.640)	-0.017 (-0.043, 0.009)	0.214 (0.056, 0.371)
S2	-0.012 (-0.279, 0.255)	-0.133 (-0.367, 0.101)	0.500 (-0.589, 1.589)	-0.574 (-3.747, 2.600)	-0.003 (-0.012, 0.007)	0.091 (-0.137, 0.320)
Treated X S1	0.064 (-0.253, 0.380)	0.042 (-0.228, 0.312)	0.271 (-0.982, 1.525)	0.828 (-2.512, 4.169)	0.060 (-0.005, 0.124)	-0.024 (-0.263, 0.215)
Treated X S2	0.106 (-0.335, 0.547)	0.167 (-0.242, 0.576)	-0.000 (-1.541, 1.541)	0.922 (-3.610, 5.453)	0.018 (-0.024, 0.060)	-0.078 (-0.465, 0.309)
Observations	161	161	18	143	161	161
Block Fixed Effects	Yes	Yes	No	Yes	Yes	Yes
Adjusted R ²	0.165	0.210	-0.164	0.366	0.362	0.018

Outcome Variables: *Finished* is a binary indicator of whether implementation was finished at the time of the field audit. *Approved Project* measures the portion of implementation or partially implemented projects that were approved by UWA. *Complete* is a binary indicator of whether non-dispersed projects were implemented completely or somewhat completely as revealed by field audits. *Pictures* is a numeric variable from 0-10 of the number of pictures of dispersed items captured during audits. *Verifiable* is a binary indicator of whether project components could be definitively linked to revenue sharing. *Somewhat verifiable* is a binary indicator of whether project components could be partially linked to revenue sharing. **Treatment Variables:** *Treated* is direct treatment at the village level. *S1* is when one of the two contiguous villages are treated. *S2* is when both of the contiguous villages are treated. **Confidence intervals** are computed from robust standard errors clustered at the village level.