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Democracy and the Distribution of NGOs Promoting Renewable Energy in Africa

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Abstract

Roughly 60% of Africans lack access to electricity, negatively impacting development opportunities. Nongovernmental organisations (NGOs) have started promoting distributed generation – small-scale, localized electricity generation – to change this situation. Despite widespread need, however, the dispersion of these distributed generation NGOs (DG-NGOs) is uneven, with high concentrations in a few African countries. Drawing on an original database and field research, we analyze location variation among DG-NGOs across the continent. We find that DG-NGOs are likely to operate in democratic settings with large populations that lack access to electricity. International DG-NGOs are also likely to operate where aid allocation levels are relatively high.

Introduction

Globally, approximately 1.3 billion people live without electricity, the majority of whom reside in Africa (International Energy Agency, 2011), where approximately 60 percent of people lack access to power (International Energy Agency, 2010). The electrification rate in Africa is not only the lowest in the world, but it appears to be *declining* on average (Eberhard, Foster, and Briceno-Garmendia et al., 2009). Meanwhile, supply is unreliable, and prices are high for those with access (Eberhard, Foster, and Briceno-Garmendia et al., 2009).

Although most countries increase electricity access by expanding national electric grids, it is often either technically or economically infeasible to connect new users to a centralised power source.ⁱ In many parts of Africa, moreover, power cuts are common, making backup sources of electricity useful. In response, many people rely on distributed generation (DG) – small-scale and localised production of electricity – for either their sole or a back-up form of power.ⁱⁱ

Both international and local nongovernmental organisations (NGOs) undertake a variety of activities to promote DG uptake in Africa such as consumer education; advocacy of government policies promoting DG (Barr, Fafchamps, and Owens, 2005); financial service provision to help cover the high upfront costs of DG systems (Acker and Kammen, 1996); and working with households and communities to implement DG projects. The presence of DG-NGOs, however, is uneven across Africa, often in surprising ways. In some poor, sunlight-rich countries, such as Kenya, one finds dozens of DG-NGOs that teach community members how to operate and maintain solar systems, secure funding for DG projects from local banks and businesses, and educate community members about the advantages of DG over kerosene. In other equally poor and solar-rich countries however, such as The Gambia, not a single NGO is

working in this area. In this paper, we seek to explain these differences in order to understand why NGOs are working to promote DG in some countries and not others.

While one might expect that NGOs would locate where need is greatest, the existing literature suggests several alternative explanations as well. Some literature on NGOs and foreign aid implies that energy NGOs might follow the agenda and funds of foreign donors (Bebbington, 2004; Ebrahim, 2003; Fowler, 2000; Edwards and Hulme, 1996). Alternatively, DG-NGO location could be driven by the ease of doing business in a country (World Bank & IFC, 2013). Recent work by Brass (2012b) that explains subnational variation among all types of NGOs in Kenya suggests the need for services and the ease of access to those in need shape NGO location choices, while patronage politics do not.

The factors associated with DG-NGO location matter not only for our theoretical understanding of the topic, but also for development on the ground. Deficiencies in access and quality of electricity have negative consequences for development. Where electricity is absent or unreliable, manufacturing businesses are unable to operate an average of 56 days per year (Eberhard et al., 2009); entrepreneurs cannot develop certain types of new businesses; students can only read clearly in daylight hours; households lack access to important forms of communication and entertainment; and women in particular are exposed to harmful fumes from kerosene lighting. Nearly all DG systems promoted by NGOs rely on clean energy from wind turbines, solar photovoltaic panels, biogas digesters, or hydroelectric turbines, which means that countries with more DG-NGOs may have a greater likelihood of meeting their energy needs through clean electricity technologies, which are more beneficial to the environment than traditional sources of energy.

In this analysis, we employ a combination of quantitative and qualitative approaches to evaluate competing theories about NGO location. The study draws on an original data set of DG-NGOs operating across the African continent, an existing systematic review of 60 case studies on DG programs (Brass et al., 2012), and interviews conducted in June 2012 with over 60 individuals working in the DG sector in East Africa. We find that, after controlling for a variety of factors, energy NGOs are more likely to operate in democratic settings with large populations that lack access to electricity. Further, only some energy NGOs appear to be influenced by aid allocation. Greater consolidation of democracy facilitates the work of NGOs – even for energy NGOs that focus on seemingly apolitical ends.

The outline for this paper is as follows. We first discuss the existing literature on NGO placement and our hypotheses regarding economic development and political regime type. We next present our research design, data, and methods, detailing how we developed a comprehensive database of all NGOs working on DG in Africa. We use these original data to provide an overview of the ways in which NGOs are engaged in DG programs. Next, we move to an empirical analysis of the conditions that lead DG-NGOs to work in specific countries in Africa. Finally, we discuss the findings and conclude with implications for scholars and policymakers.

Theories of NGO Placement

At present, there exist only limited analyses of NGO and nonprofit organisation location distribution across countries, and in Africa specifically. These studies tend to focus on: 1) communities' level of *need* for the service provided; 2) the level of *convenience* for NGOs in the country; and 3) the *political environment* for NGOs operating in the country.

Need

All NGOs are mission-oriented organisations. Rather than focusing primarily on profits or politics, they share a common goal of addressing some pressing social issue. In principle, then, NGOs locate and distribute services to the areas of the world that have the highest degree of need in order to fill the void that governments or the private sector cannot or does not fill.

Turning to the few existing studies of NGO location, however, we find inconclusive evidence about the link between the number of NGOs and objective need in an area. Several studies find that NGOs do not locate where need is greatest. In Bangladesh, for example, Gauri and Galef (2005) report that the per capita concentration of NGOs was lowest in the poorest sub-districts. Similarly, Fruttero and Gauri (2005) find that the net change in the number of NGO programs in a community in Bangladesh between 1995–2000 was not related to the level of community needs. Likewise, NGO placement in the Andes region of Latin America was not associated with areas of poverty and need (Bebbington, 2004). Studies of nonprofit organisations in the United States have produced similar findings, notably that nonprofits tend to locate in relatively affluent urban areas, not the poorest areas (Bielefeld, 2000; Jossart-Marcelli and Wolch, 2003; Nemenoff, 2008; Allard, 2009).

Meanwhile, other studies report evidence that clearly supports the hypothesis that NGOs locate where need is greatest. Brass (2012b), for example, finds that the number of NGOs at the district level in Kenya is correlated with the objective need for health services and infrastructure in that area. Peck (2008) similarly finds the number of NGOs providing anti-poverty services in the city of Phoenix in the US is a function of neighborhood poverty. Looking cross-nationally,

Buthe et al. (2012) also find that American private development assistance is given based on need, in accordance with altruistic and principled norms of serving destitute populations.

Still another set of literature is not as categorical regarding whether or not the need hypothesis is valid. An analysis of NGO establishment decisions in Andhra Pradesh, India revealed that NGOs might be initiated based on the NGO's perceptions of need, but that these perceptions may differ substantially from the actual needs at the local level (Jammulamadaka and Varman, 2010). A similar dynamic may be at play in Uganda, where Barr and Fafchamps (2006) report that NGOs intend to locate based on objective need, but that it is sometimes infeasible or impractical to do so.

Since the existing scholarship in this area is strongly contradictory, we do not have a strong a priori assumption about this factor. If the theory that NGOs locate based on need is valid, we would expect that African countries with lower GDP per capita and lower electrification rates will likely have a higher presence of energy NGOs. We would also hypothesize that a positive relationship exists between DG-NGOs and population, since NGOs may believe that working in highly populous countries will have a greater impact than similar operations in less populous countries.

Convenience

The relative ease of doing work in a country could also be a determinant of DG-NGO location. Where it is easy to begin operating an NGO, we would expect to see more DG-NGOs. NGOs might avoid countries with significant challenges in basic security, transportation, communication, or the legal enforcement of basic property and contractual rights. Additionally, NGOs might locate themselves where staff members have professional, personal, or historical

connections. For instance, British NGOs may be keener to work in former British colonies due to the countries' diplomatic and trade ties with one another and staff relationships with the local population. NGOs may also choose to locate in countries with major urban centers that serve as regional hubs. Cities, such as Nairobi in East Africa, or Johannesburg in Southern Africa, have a large network of development organisations and NGOs that facilitate cooperation among different stakeholders in the field. These cities are often attractive places to live for international NGO staff, which could lead NGOs to locate there instead of the countries with the most need.

The motivation for NGOs to place themselves in countries that are convenient may be “self-serving,” either benefiting the NGO or the staff it employs. Or, the reasoning may be more nuanced and complex. For example, NGOs may decide that they can help more people by locating in areas where operational costs are minimal. The most-needy communities are often remote and very costly to reach. Thus, NGOs may combine the desire to help those most destitute with pragmatic considerations such as accessibility, population density, ability to attract and retain quality employees, and access to donors (Kaler and Watkins, 2001; Brass, 2012b). If this logic holds, we would expect to see greater numbers of DG-NGOs in countries that are near cities that serve as regional hubs and in countries that share a colonial legacy. Additionally, we would find fewer in countries where the initial development and daily operation of an NGO is arduous and time-consuming.

Political Environment

The political environment of a country, in terms of both domestic regime type and external donor relations, may also shape the number of NGOs in that country. Because the African continent contains a wide variety of political regime types, we can examine the effect

that different levels of democratization have on NGO location in Africa. According to *The Economist's* Economist Intelligence Unit, as of 2010, Africa had six full democracies, nine flawed democracies, 12 hybrid regimes, 22 authoritarian regimes, and one state struggling to establish a centralised system ("The Democracy Bug is Fitfully Catching On," 2010).

Regime type is likely to matter for NGOs because authoritarian regimes are more likely to restrict NGO operations than are more democratic regimes (Lindsnaes et al., 2007). Such authoritarian policies may include bans on receiving funds from international donors, obstacles to official government registration, restrictions on where NGOs can operate, and limitations on the types of programs they can operate (Bratton, 1989). The lack of civil liberties, limits on free association and restrictions on travel to and within some authoritarian countries also hinder NGO activities. Russia is a case in point demonstrating the effect of democratization on the presence and activity of NGOs. During the period of expanding political liberalization in Russia, the number of NGOs reportedly increased from 50,000 in 1993 to about 350,000 in 2001 (Uhlen, 2006). Subsequently, under Putin, however, the Russian regime became more authoritarian, and laws placing restrictions on NGOs were passed, authorizing the government to shut down NGOs that the government claimed were covers for terrorists groups or foreign spy groups (Ferris-Rotman, 2009). Free speech and civil liberties have been truncated in the country as well, reducing NGOs' ability to do their work.

Similar dynamics have also been at play in parts of Africa. In Ethiopia in recent years, several NGOs were forced to cease operations because they received more than 10 percent of their overall resources from abroad ("U.N. Official Concerned about NGO Freedoms," 2012). Similar authoritarian policies have limited NGO operations in Egypt, Djibouti, Sudan and Eritrea. In Eritrea, for example, foreign NGO workers have had at times to apply to the

government for permission to travel outside of the capital city, Asmara (U.S. Department of State, 2013). Likewise, in Kenya, in the early 1990s, the government passed legislation requiring NGOs to submit plans and budgets and enabled the government to deregister NGOs (Brass, 2010). Kenya's President Moi was concerned that donors favored NGOs over the government, and that NGOs were therefore a "security threat" to the state (Chege, 1999; Owiti et al., 2004).

Few studies to date test the relationship between regime type and NGO presence. Brass (2012b) finds that political variables are not systematically correlated with variation in NGO presence at the sub-national level in Kenya. We hypothesise that regime type will be associated with DG-NGO placement at a national level, however, as countries with less politically free regimes are less likely to allow unfettered access by foreign donors and autonomy for civil society organisations.

Finally, we assess the role of foreign aid on DG-NGO location. One important thread of this scholarship on NGOs has been highly critical of the role of foreign aid. Edwards and Hulme (1996) argue that many of the potential advantages held by NGOs are undermined by foreign donors, who use their control over resources to set NGOs' agenda. Although some scholars reject the notion that foreign aid has such exclusively negative impacts on NGOs (Keck & Sikkink, 1998), the literature seems to concur that donors influence NGO activity in some way. Regardless of whether the NGOs' agendas are wholly determined by foreign donors, foreign funds are tremendously important for NGO operations. Kenyan NGOs, for example, received over 90 percent of their funding from international sources (Brass, 2012b). We therefore hypothesise that greater levels of overseas development assistance in a country will increase the number of DG-NGOs in a country.

Research Design and Methods of Data Collection and Analysis

To assess NGO involvement in DG throughout Africa, we collected quantitative and qualitative data from a variety of sources. First, we created an original, comprehensive database of DG-NGOs operating in 53 countries on the continent. This was necessary, since few accurate databases exist on NGOs (Watkins et al., 2012).ⁱⁱⁱ To do this, we used a multi-pronged approach, consolidating existing online NGO lists; collecting NGO contacts from relevant international organisations; and, conducting a systematic online search in both English and the country's official language between August 2011 and May 2012. Most of the NGOs included in the database were identified through the Internet search. Each search included, in order, the African country name, a type of energy source, and "NGO". We carefully read through each search result on each of the first five pages of results for each set of search terms, clicking not only on NGOs' own websites, but also news articles, blog posts, or reports from governments, NGOs, or development agencies, thus examining a total of over 20,000 unique web pages. We acknowledge the potential limitation of this type of online search; since Internet penetration is relatively low across Africa,¹ it is possible that our strategy led us to leave out smaller organisations or those not seeking an international audience. Given that the majority of NGO funding in Africa comes from international sources (Brass, 2012a), however, and that most international organisations have a web presence, we believe that we have captured the vast majority of NGOs.

Second, we undertook a review of academic case study literature on DG programs throughout the developing world, drawing on a random sample of 60 case studies of DG projects implemented in developing countries around the world, published in English in peer-reviewed journals between January 1995 and September 2011 (Brass et al., 2012). We also examined

documents produced by donors, NGOs, governments and private companies working in the energy sector to understand DG's role in development generally, as well as specific examples of implementation of DG programs.

Because neither the cross-sectional NGO database, nor the secondary sources described above, provided insights about changes over time or the motivations of NGO leaders, we decided to conduct field research interviews in one case study country. We chose Kenya because the greatest number of NGOs chose to locate there. We conducted approximately 40 interviews with 60 respondents in key DG-NGO, business, donor, government, and research offices in over a dozen cities, towns and villages in Kenya in June 2012. The interviews were semi-structured in format, and lasted between 20 minutes and two hours. Respondents were asked about their organisation's DG programs or products, the motivation for these programs, their choice of location, government policies that affect DG, and their own use or experiences with DG. The interviews are cited in text in the form 0-0000x, representing the nth interview of a month-year pair, followed by the type of respondent (as explained in endnote i). We use data from these interviews to help interpret the statistical correlations found in our regression analysis. For further information on these data sources, refer to the Appendix.

The research design for data collection thus combines a cross-sectional comparison of all countries in Africa in 2011-2012 with an intensive case study analysis of Kenya. We restrict our analysis of these questions to Africa, including North Africa, for several reasons. Africa is the most electricity-poor region of the world (International Energy Agency, 2010). This means that the need for electricity is most dire on the African continent, but also that the possibilities for leapfrogging to clean DG technologies are tremendous. This paper's analysis thus has policy significance for the continent and saliency for many developing countries around the world.

African cases also offer an excellent opportunity for comparison because of the variation in types of DG in Africa, which run the spectrum from biogas to small hydropower stations to solar photovoltaic panels to hybrid systems. In terms of economic and political development, moreover, Africa provides a range of countries to examine. For instance, the 15 lowest rankings on the UN's Human Development Index are African countries; at the same time, in 2011, African countries had significantly higher GDP growth at a near five percent rate compared to less than two percent in Europe and North America (World Bank 2011). Likewise, while Africa has some infamously failed states and many flawed democracies, there are also a number of more consolidated democratic systems on the continent. The similarities shared among African cases as well as the variations in theoretically relevant variables provides a rigorous research design for the paper's data collection and analysis detailed below.

Variation in Small-Scale Renewable Energy NGOs in Africa

Our DG-NGO database reveals a variety of patterns in the composition, distribution, energy focus, and roles of organisations across Africa. As Table 1 shows, approximately half of all DG-NGOs working in Africa are based in developing countries and the other half are based in developed countries, as defined by membership in the OECD. Approximately 135 of the NGOs that report country information have programs in a single African country, while 40 organisations work in two to five countries, and 21 organisations have programs in six or more countries.

[Insert Figure 1 approximately here]

[Insert Table 1 approximately here]

The distribution of DG-NGOs across Africa varies significantly, despite widespread need for greater energy access across the continent. This disparity is reflected in Figure 1. Six countries do not have any DG-NGOs: Angola, Cape Verde, Djibouti, the Gambia, Libya, and Sao Tome and Principe. In contrast, Kenya, Uganda, Tanzania, Ghana, and Senegal have the largest number of DG-NGOs, with 20 or more NGOs each. Sixteen of the 53 countries have more than 10 DG-NGOs each. These countries are primarily located in East and West Africa while North African countries have the fewest number of DG-NGOs.

Third, DG-NGOs focus on five main types of electricity sources in DG projects across Africa: solar photovoltaic (PV, or “solar panels”), wind, hydroelectric, biogas, diesel, and hybrid sources that combine two or more of these resources. Solar PV programs are the most prevalent type of energy project promoted by DG-NGOs, accounting for 72 percent of all DG-NGOs in Africa. Biogas,^{iv} micro-hydro, and wind energy projects are less prominent, favored respectively by 25, 21, and 16 percent of energy NGOs in Africa. These energy NGOs are remarkably focused on renewable energy solutions; only 3 percent of NGOs work with hybrid systems and 1 percent work solely with carbon-based fuels. Not all NGOs that have DG programs are focused primarily on energy activities; slightly more than half of all DG-NGOs focus exclusively on energy activities, while the remaining organisations conduct DG programs in conjunction with other development activities.

Finally, based on the activities listed on these NGOs’ websites, linked news articles, and our Kenyan field research, DG-NGOs undertake seven common, yet distinct roles: project implementation, capacity building, policy and advocacy, finance, research and education, technology development and liaison between communities and donors or among other NGOs.^v

In general, the different regions of the continent have a very similar distribution of roles played by DG-NGOs.

According to their websites, the vast majority of the continent's DG-NGOs (74%) played the role of project implementer. After implementation, capacity building is the next most frequent role played by DG-NGOs, mentioned on 25 percent of these NGOs' websites. Approximately 15 percent of NGOs in the database explicitly described involvement in subnational, national, or regional policy or advocacy work. Finally, the least mentioned DG-NGO roles were researcher (12%), funder (9%), technology developer (4%), and liaison (2%).

When collecting information on DG-NGOs, we were interested in variation along each of these four issues. The data reveals little interesting variation, however, in either the roles played by DG-NGOs or in the type of energy promoted by them. The former dimension does not vary significantly by region or country. The latter appears to reflect the dominant resource endowments in the region. For example, 46 percent of DG-NGOs that work in Central Africa are involved in hydroelectric projects, a much higher rate than the other regions, while every DG-NGO in North Africa works with solar panels.

Analysis of Uneven DG-NGO Location Across Africa

Statistical Analysis of DG-NGO Database

Our primary dependent variable is the number of DG-NGOs in each of the 53 countries of Africa. We employ negative binomial regression to analyze the data. Negative binomial regression is appropriate for our data, since a count of NGOs involves non-negative integers and skews toward zero.

To assess the hypothesis that countries with greater need stimulate more NGOs, we use the percent of a country's population with access to electricity, logged GDP per capita, and logged population size as independent variables. GDP per capita and access to electricity, however, are highly collinear. We favor electricity access in the models because it explains a greater amount of the variation in the dependent variable, and because it is a more direct measure of the need that DG-NGOs seek to fill.

To account for the level of convenience in countries, we use several variables. First, we use the World Bank's measure for the number of days it takes to start a business as a proxy for the ease of an NGO's startup and daily operations within the country.^{vi} A regional hub dummy variable is included to control for countries that may be popular among DG-NGOs because other NGOs, donors, and international organisations are already based there. Regional hubs typically have a high level of NGO activity. Kenya, for example, is the location not only of two UN agency world headquarters—UN Environmental Programme and UN Habitat—but also the regional base for humanitarian and relief activities targeted for South Sudan and Somalia. In one model specification, we also control for the colonial history in the country by including a dummy variable for whether the country was once a British colony. Finally, we considered testing whether the extent of a country's transportation infrastructure might facilitate DG-NGO location. The best measure available was road density, which was not included in our models due to the extent of missing data, but was not statistically significant.^{vii}

To account for each country's regime type, we use countries' 2011 combined average rating from Freedom House, a non-profit organisation whose *Freedom in the World* reports have been published annually for 40 years. Freedom House scores are an index comprising political rights and civil liberties measures.^{viii} As checks for robustness, we also examine the results using

data from the Polity project and Transparency International's corruption perception index scores, both of which are highly collinear with the Freedom House scores. In addition, we test whether foreign aid influences DG-NGO location by including official development assistance (ODA) per capita in the model.

Table 2 provides a summary of the variables and Table 3 presents the descriptive statistics. The independent variables used in this analysis are based on 2011 data, unless noted otherwise.

[Insert Table 2 here]

[Insert Table 3 here]

We would have liked to include a number of other variables, but are limited by missing observations for many countries or a lack of quality data. For example, obtaining comprehensive data on country-level trade policies that could negatively affect the importation of DG technologies could improve the explanatory power of our model. We conjecture that if we had data on the the supply side of the financial flows, disaggregated by donor countries' climate or development financial institutions, we could better explain the variation in the number of NGOs per country. It would also be desirable to control for a country's energy resource endowment, such as wind potential, solar flux, damable water, or coal mining potential. A measure of government support for DG would also improve the performance of our models. Finally, we would like to control for the total number of NGOs working in each country. These data, however, are not available for most countries in our dataset. In light of these data limitations, as well as the small sample size and other modeling limitations that restrict our ability to draw causal inferences, these results should be considered preliminary.

Table 4 presents a series of regression models, in which we assess the factors associated with DG-NGO location. Because of the small number of country observations, we are limited in the number of variables we can include in any one model. Thus we provide several distinct model specifications. In constructing these equations, we tested for both multicollinearity and heteroskedasticity and found that neither was present.

[Insert Table 4 here]

Results demonstrate that a negative relationship exists between access to electricity and the number of DG-NGOs, all else constant. Therefore, there is a positive relationship between the amount of need in a country and the number of DG-NGOs working in it. This relationship is statistically significant across all model specifications. Moreover, countries with larger populations have a positive and significant association with the number of DG-NGOs. These results are robust across all models.^{ix} When we add GDP per capita to the model containing electricity access and population, we find no statistically significant relationship, though this is likely due to the relatively highly collinear relationship between GDP per capita and electricity access.^x

Convenience factors do not predict DG-NGO location. We find an insignificant relationship in models that use the number of days required to start up a business as a proxy for ease of DG-NGO operations within the country, and in models that use binary variables for former British colonies or for countries that are regional hubs, *ceteris paribus*.

Countries with more democratic regimes – those with greater respect for civil liberties and political rights – tend to have higher numbers of DG-NGOs operating within their borders, all else equal. This result was significant and consistent among all six model specifications. When alternate measures of democracy, Polity and Transparency International index scores,

were used in place of Freedom House measures, we obtained similar results,^{xi} which supports our hypothesis that NGOs are more likely to operate in places where their movements, actions and strategies are less tightly controlled or regulated by an authoritarian regime. Likewise, the amount of foreign aid per capita appears to have a meaningful relationship with the number of DG-NGOs in the country. This finding provides some support to the critique that NGOs may be handmaidens of donor countries or agencies.

Disaggregating DG-NGOs by headquarters location and by size may also reveal interesting variation among NGOs' location decisions. Here, we examine whether NGOs headquartered in developing countries act differently than those based in developed countries,^{xii} whether home-grown organizations are associated with different factors than NGOs based in another country,^{xiii} and whether large NGOs (defined as working in multiple countries) are different than small ones. We expect to see differences among these subsections of organizations, since the goals, motivations, resource constraints, and resource dependency issues tend to vary along these lines (Lewis and Sobhan, 1999); Jammulamadaka, 2012 ; Morfit, 2011).

We test the possibility of these differences in a series of models presented in Table 5, which only documents those models with “need” and “political” factors for the sake of parsimony. In models 1 and 2, we split the NGOs in our database according to whether they are headquartered in a developing or developed country, and run the model separately for both versions of the dependent variable. The results do not differ substantively to those presented in Table 4: access to electricity, level of democracy, and population remain significant. We find, however, that the number of NGOs that are headquartered in *developed* countries is positively correlated with levels of development assistance per capita, but that there is no statistically significant relationship between the number of NGOs based in a *developing* country and aid

levels. This suggests that developed country-based NGOs may be benefitting from—or dependent on—aid in a way that their developing-country NGO counterparts are not.

Disaggregating the dependent variable this way, additional analysis shows that higher GDP per capita and being a regional hub are associated with greater numbers of developing country-headquartered NGOs, but that there is no significant relationship between either of these independent variables and the number of developed country-based NGOs. It may be that having greater wealth per capita in a country and being a regional development hub in general spurs the creation of indigenous NGOs, which then feeds back in fostering a vibrant civil society, ultimately supporting a more consolidated democratic regime.

In models 3 and 4, we assess whether domestically headquartered organizations are associated with different factors than those based in another country. Here, we again find that democracy and population are statistically significant, but see that electricity is significant only for non-domestic organizations. This is not surprising given that the average level of access to electricity across the continent is 36 percent, meaning that nearly all countries have some need for energy NGOs.

[Insert Table 5 here]

In models 5 and 6, we assess whether location is based on the size of the NGO. We divide the sample between those DG-NGOs that operate in a single country, denoted as “small,” and those that operate in more than one country, denoted as “large”. International presence, therefore, serves as a proxy for the size of the organisation, since small organisations tend not to work in multiple countries. As was the case for NGOs based in developed countries, we again find that access to electricity, regime type, population and aid levels are all significant across

model specifications, and the other variables remain insignificant. Similarly, when the dependent variable is the number of NGOs in each country, counting only NGOs that are located in only one country, only access to electricity, regime type and population are significant.

These results uphold the argument that need and the democratic regime are factors most strongly associated with NGO location decisions. Our finding that higher levels of democracy are associated with a greater number of domestically-headquartered NGOs, as well as NGOs operating in only one country, supports theories about the positive relationship between civil society and democracy within a country (Tocqueville, 1835; Putnam, 1993). It may be, however, that different logics are at play for foreign and domestic organizations, a point we explore further in the conclusion.

We turn now to a qualitative analysis of field research in Kenya to put these findings in context and to paint a more detailed picture of DG-NGO location decisions and activities. This subsequent research exercise also allows us to confirm our findings from the statistical analysis, which is especially helpful given the inherent limitations of the modeling approach. We begin with a discussion of the DG-NGO sector in the country in general, showing how and when the Kenyan sector differs from trends across Africa as a whole. Next, we analyze our statistical results above in light of data from informed observers in the sector in Kenya.

Qualitative Analysis of the Kenyan Case Study

Kenya has the highest number of DG-NGOs on the continent (47). DG-NGOs in Kenya generally concentrate on the same types of DG technologies as NGOs in Africa as a whole, with slightly less emphasis on solar PV technology and more on biogas projects. During our field research, solar PV was the most frequently observed DG technology. We contend that this street-

level impression as well as the massive media attention given to solar in Kenya is driven not just by NGO activity but by the dynamic and large number of for-profit businesses in the Kenyan solar market. As of 2009, approximately two percent of the Kenyan population used solar PV panels to generate their main source of light (Kenya National Bureau of Statistics, 2009). The emphasis on biogas projects may be due to the importance of dairy cattle – which create biogas inputs – in the agricultural sector of the Kenyan economy, since Kenyans drink more milk per capita than people in any other developing country (McSherry and Brass, 2007). Even though Kenyan DG-NGOs are not promoting hybrid technologies, we found that many Kenyans created their own hybrid systems both for long-term cost-savings and for back-up energy supply, usually combining PV panels with the government-owned grid-based electricity.

In Kenya as on the continent as a whole, the largest percentage of DG-NGOs focus on implementation activities. In Kenya, such implementation activities include: installing PV panels on single-family homes, community communication and entertainment centers, NGO offices, and orphanages (10-0612n, 22-0612n, 27-0612n, 39-0612c); the implementation and supervision of household biogas digesters (23-0612n); and, the construction of micro-hydro systems to power a community mini-grid (17-0612n, 20-0612n, 29-0612n, 33-0612c).^{xiv} While some NGOs simply distribute solar PV lights free-of-charge (18-0612n), others focus on developing managerial capacity among Kenyans to implement programs (17-0612n, 9-0612r, 20-0612n), or to develop entrepreneurial and business skills that could be used in the DG sector (16-0612n, 30-0612n, 10-0612n, 14-0612n). In some cases, this work entails long-term, local hand-in-hand assistance (17-0612n, 20-0612n, 30-0612n), while in other cases, it means sending potential entrepreneurs for intensive training away from their homes (3-0612b, 5-0612r). A small but significant number of Kenyan DG-NGOs work to inform new energy policy, sometimes

partnering with the government in policy formation (14-0612n, 15-0612n). Other NGOs aspire to influence policy indirectly by conducting research for policymakers (9-0612r). After implementation, capacity building, advocacy, and research, Kenyan DG-NGOs focus most frequently on the issue of funding DG projects. While less frequently cited on NGO websites elsewhere in Africa, financing issues were the most commonly mentioned constraint among our respondents in Kenya. A concern most commonly expressed was that microfinance institutions have had difficulty developing lending programs for DG products, which limits their distribution to the poor (1-0612c, 2-0612c, 23-0612n, 38-0612d).

The main findings from the statistical analysis of DG-NGOs across Africa were also reflected in our interviews with DG-NGO, community-based organization (CBO), business, and government leaders in Kenya. Foremost, respondents spoke about their motivations for working with DG programs in Kenya as addressing development needs. These leaders frequently emphasised the poverty of the communities where they worked (4-0612c) as well as the lack of both affordable and reliable access to electricity provided by the Kenyan grid (17-0612n, 18-0612n). One DG-NGO representative explained how his organisation selected remote communities with poor roads that were ‘without electricity now and wouldn’t get it in the near future’ but had ‘lots of sunshine’ (9-0612r). Another DG-NGO founder described his worry that ‘the poorest of the poor can’t access conventional renewable energy technologies’ and so he wanted to ‘fill the gap that we were able to see in the local communities’ (29-0612n). Many of the DG-NGO leaders also skipped directly to their goals as long-term development benefits for communities (10-0612n). Researchers studying energy policy agreed, saying ‘This increases the livelihood for the people – it brings development’ (9-0612r).

Meanwhile, very few of the DG-NGO leaders described “convenience” as the primary rationale for their DG work in Kenya. In contrast, many of the business leaders emphasised the ease of doing business as one of the primary reasons they were successful in Kenya. For example, one business representative explained that the firm decided to expand operations from India to Kenya because it was one of the ‘biggest markets’ and then contrasted Kenya with Tanzania, where it ‘was not easy to work!’ (2-0612c).

Other potential “convenience” motivations for NGO location that were not mentioned by Kenyan DG-NGO leaders were the importance of being in a regional hub like Nairobi or the British colonial legacy. Although 14 Kenya’s 47 DG-NGOs were either based in or had their main Kenya office in Nairobi, many of the DG-NGO leaders we interviewed were working for organisations based in smaller secondary locations, relatively far from the capital city. Thus, the benefits of the regional hub did not seem foremost in these DG-NGO leaders’ thinking about their activities.

Also reinforcing the results of the statistical analysis, Kenyan DG-NGO leaders frequently emphasised the importance of politics for their work. The interview respondents repeatedly spoke of the increased ease of working in the country following the end of the authoritarian regime of Daniel arap Moi (see also Brass, 2012a). While the Kibaki administration, in power during field interviews, did not represent a full-fledged democracy either, there was considerable political opening while Kibaki governed, between 2002 and 2013. As one respondent said, ‘NGOs are really seen as partners; there was a time when they [the government] were not friendly...NGOs are now seen as partners. For a long time, we were seen as troublemakers’ (23-0612n). Over the last ten years, the dynamic has clearly changed. Another described why working in Kenya is easier than working in Nigeria, saying that in the latter,

government has ‘a hand in everything,’ whereas in Kenya, government is fairly hands-off, or ‘neutral’ (2-0612c). Similar stories were told of working in Kenya versus Ethiopia: in the latter, bureaucratic red tape and a repressive regime makes working as a foreign organisation difficult, whereas Kenya has a quite open climate, making it easy to start organisations as a foreigner (19-0612r, 2-0612c). At the same time, several DG-NGOs asserted that certain powerful individuals in Kenya benefit from the grid-focused status quo, and therefore thwart all but the smallest DG programs (9-0612r, 5-0612r, 15-0612n).

Conclusions

Drawing on an original database of DG-NGOs across Africa and field research in Kenya, this paper evaluated the location of DG-NGOs across the continent. The findings from this analysis are relevant not only in Kenya or Africa but also in developing countries with weak states around the world. These include many states of Asia, the former Soviet Union, and parts of Latin America. The results may be less applicable in countries where most funding for NGOs comes from that country’s government, however, since the government will likely have much greater influence over program location than they do in much of Africa.

Based on this analysis, we found strong support for the combined role of need and democracy in explaining why DG NGOs locate in some African countries and not others. We argue that DG NGOs may be more likely to work in more democratic countries with larger populations that have less access to electricity. Our findings highlight that DG-NGOs are working in the places where they are most needed. NGOs that aim to assist the “bottom of the pyramid” may indeed be doing so, at least at the macro level, as we find evidence that DG-NGOs

self-locate in countries with large, needy populations that lack access to electricity. Moreover, convenience does not drive most DG-NGOs decisions about where to locate.

NGO location, however, is not singularly determined by need. NGOs working on DG programs in Africa appear to be significantly influenced in their choice of location by political climate in these countries, and in some cases, the level of international aid. DG-NGOs, regardless of headquarter location or size, are more likely to work in countries with more democratic regimes. While political factors are not associated with NGO location at the sub-national level, they clearly matter at the cross-national level as DG-NGO leaders choose where to work. This finding that higher levels of democracy are correlated with a greater number of both foreign and domestic NGOs could be further examined, however, as it is possible that the meaning of this correlation differs for the two types of organizations. It may be that foreign NGOs are *drawn* to democratic countries, as they tend to be easier to work in, while the existence of home-grown organizations, acting as CSOs, actually *enhance* democracy in a virtuous cycle. We cannot disaggregate the causal logic given the existing data.

Despite these initial findings, several important research topics remain; we examine these here and issue a call to action among fellow researchers. First, while we have examined the factors associated with the number of DG-NGOs in a country in general, it would be fruitful to examine whether these same conditions are associated with various types of DG activities by the NGOs. For example, we hypothesise a strong and positive correlation between democratic policy regimes and NGOs that engage in advocacy work. Likewise, we note that DG-NGOs and businesses involved in the sale and distribution of DG technologies appear to make location decisions differently. Our sample size is too small, however, to test these differences formally.

Second, many interview respondents in Kenya discussed the government's specific policies regarding renewable energy technologies and how they compared favorably or unfavorably with other government policies in Africa or the East African sub-region. While all six countries of the East African Community have removed their import tariff on solar PV, other important variations in renewable energy technology policy remain. For example, Kenya has no value-added tax on the sale of solar components. Compare this to Nigeria, which has a 20 percent import tariff and a 5 percent value-added tax on solar products, which makes the products more expensive for end-users in Nigeria, assuming they are both importing their panels from the same source (1-0612c).

Likewise, feed-in tariffs—subsidies for electricity production over a set number of years—not only vary across country on paper, but also in practice. Several respondents in Kenya described interminable delays in negotiating the feed-in tariff and processing the requisite paperwork. One respondent complained that, 'There are paper tariffs, but they are not implemented' (5-0612r).

Other subsidy policies also vary across countries. In Tanzania and Uganda, the governments subsidise solar panel purchases (at between \$2.50 and \$5.00 per watt). According to our interview respondents, these two governments are more serious about disseminating solar technologies for rural electrification than is the government of Kenya, which is more focused on 'big projects' and grid expansion (5-0612r). At the same time, connecting to the grid in Kenya is very expensive, costing between \$500 and \$1200 per connection, compared to Ghana, where the government highly subsidises connections (38-0612d). These differences have stimulated higher rates of new grid connections in Ghana than in Kenya. Another result of Ghana's rapid grid expansion, however, is reduced demand for DG technologies (38-0612d).

In summary, we pose the following questions: how does government policy on energy technologies affect the dissemination of particular technologies for DG in a country? How does the role of a government's energy technology policies compare to the effect of the country's overall level of economic development, extent of democratization, and access to foreign aid? Answers to these questions will be best examined by comparing the event history of policy adoption in countries around the world over a significant period of time. The combination of such global comparative policy analysis with in-depth field work to examine how formal policies may or not be implemented on the ground can help further our understanding of the future of energy access for the world's poor.

Despite the need for additional research in this sector, there are already several important implications of existing results. One implication may provide an explanation for the relative lack of advocacy work by DG-NGOs across the continent. Only 14 percent of NGOs in our database mention working on either policy or advocacy – and many of these work only collaboratively with government on policy. Even in Kenya, a relatively open political regime, DG-NGOs do not usually take an aggressive stance in advocating sound policy (16-0612n). They are sometimes critiqued for this; cynics assert that international staff in DG-NGOs do not focus on lobbying government because they do not stay in one post long enough to affect policy change, while national staff do not want to compromise their relations with the government by pushing for policy reform (5-0612r). DG-NGO representatives alternatively state that, with limited available resources and, at best, indifferent government responses to their lobbying efforts, they do not consider advocacy as an efficient use of time (16-0612n).

Further, our analysis has implications for the ways in which aid is distributed. Our findings suggest that only some DG-NGOs are likely to be influenced by the amount of official

development assistance disbursed per capita in these countries. In *all* cases, the domestic regime is important, but for OECD country-based NGOs, and for larger NGOs, foreign aid is also significant. While DG-NGO leaders often mentioned donors and donor funds during our interviews, some NGOs appear to wield at least some significant autonomy from the ebb and flow of donor funds. International NGOs working in multiple countries may be more influenced by aid distribution patterns than are single-country NGOs. This reinforces the idea that donor aid is going to larger rather than smaller NGOs, which we know to be true of donors like USAID (Kerlin, 2006). Donors who claim to focus on indigenous, or country-based solutions to problems may need to examine whether these claims match their funding patterns, and adjust their behavior accordingly.

Finally, our finding about the importance of democratic regime type is notable, since renewable energy services are usually considered relatively technical and apolitical activities. Yet, even though the DG-NGOs in our database spend their time advocating for more solar PV and biogas digesters, rather than the civil rights of opposition candidates or the human rights of historically marginalised indigenous groups, regime type still matters. Therefore, if governments want assistance in increasing access to electricity, they may consider liberalizing their political policies. Assuming that DG-NGOs do positively affect development, we argue that authoritarian countries discourage NGOs from operating within their boundaries. Governments can use this knowledge to better understand NGO operations and formulate policy to promote NGO work in areas that need it most.

Table 1: Characteristics of DG-NGOs

	Number	Percentage
NGOs headquartered in developed countries	100	49%
NGOs working internationally, meaning in more than one country	67	33%
Average number of countries worked in for NGOs with programs in more than one country (rounded to whole-country number)	6	N/A
NGOs working exclusively with clean energy	202	99%
NGOs working with solar photovoltaic panels	148	72%
NGOs working on biogas programs	51	25%
NGOs working on hydroelectricity	43	21%
NGOs working on wind energy	33	16%
NGOs working with fossil fuel-based energy	3	1%
NGOs whose main focus is energy	104	51%

Table 2: Variable Descriptions

Variable Name	Variable Representation	Variable Description	Source	Year
Number of NGOs	Dependent Variable	The number of NGOs in each country	Created database	2011
Number of NGOs Headquartered in a Developed Country	Dependent Variable	The number of NGOs, given organisation is headquartered in a wealthy (OECD) country	Created database	2011
Number of NGOs Headquartered in a Developing Country	Dependent Variable	The number of NGOs, given organisation is headquartered in a developing country	Created database	2011
Number of NGOs Headquartered in Another Country	Dependent Variable	The number of NGOs in a given country that are headquartered outside the country	Created database	2011
Number of NGOs Headquartered Domestically	Dependent Variable	The number of NGOs that are headquartered domestically	Created database	2011
Number of Small NGOs	Dependent Variable	The number of NGOs, for organisations working in a single country	Created database	2011
Number of Large NGOs	Dependent Variable	The number of NGOs, for organisations working in multiple countries	Created database	2011
GDP Per Capita (logged)	Need	Mid-year population estimates	World Bank	2010
Electricity Access*	Need	Percentage of population without access to electricity	International Energy Agency and others	2009-2011
Population (logged)	Convenience	Total country population	World Bank	2010
Business Days	Convenience	Total number of days required to start a firm	World Bank	2010
Regional Hub	Convenience	Dichotomous variable for Kenya, Ghana, Egypt, Senegal, and South Africa		N/A
British Colony in the Past	Convenience	Dichotomous variable indicating that a country was at one point a British colony	Historical records	N/A
Democracy	Politics	A combined average rating of the country's political rights and civil liberties (1 = least free; 7 = most free)	Freedom House	2011
Foreign Aid Per Capita (logged)	Foreign Aid	Net official development assistance divided by midyear population	World Bank	2010

*This variable was compiled primarily from IEA, but information on a minority of countries came from Reegle, IRENA, UNDP, World Bank, African Development Bank, Central African Power Pool (PEAC), Africa-EU Energy Partnership, Elsewedy Electric, and the governments of Cape Verde, Mali and Swaziland. Data from Djibouti dates to 2003; that of Seychelles, 2008.

Table 3. Summary Statistics

Variable	N	Mean	St Dev	Min	Max
Number of NGOs	53	8.89	10.09	0	47
Number of NGOs Headquartered in a Developed Country	53	5.94	6.48	0	25
Number of NGOs Headquartered in a Developing Country	53	2.94	4.16	0	22
Number of NGOs Headquartered in Another Country	51	6.85	7.39	0	30
Number of NGOs Headquartered Domestically	51	2.04	3.47	0	20
Number of Small NGOs	53	2.25	3.24	0	17
Number of Large NGOs	53	6.64	7.47	0	30
GDP Per Capita (logged)	52	7.15	1.29	5.26	11.12
Electricity Access	52	36.51	31.23	1.8	99.8
Population (logged)	53	15.84	1.60	11.37	18.88
Business Days	51	42.41	43.66	3	216
Regional Hub	53	0.10	0.30	0	1
British Colony	53	0.32	0.47	0	1
Democracy	52	0.50	0.24	0.14	1
Foreign Aid Per Capita (logged)	53	4.08	1.06	0.29	6.50

Note: GDP per Capita and Electricity Access are both missing data for Somalia; Business Days for Libya and Somalia; Freedom House Score for Comoros; and Polity for Seychelles, Sao Tome & Principe, Somalia and Tunisia. This explains why there are different numbers of observations across the models in Table 4.

Table 4: Negative Binomial Regression Analyses: Number of NGOs in a Country

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	# of NGOs	# of NGOs				
<i>Need Factors</i>						
Electricity Access	-0.0138*** (0.00335)	-0.0175*** (0.00475)	-0.0133*** (0.00339)	-0.0151*** (0.00343)	-0.0138*** (0.00336)	-0.0104** (0.00357)
GDP Per Capita (logged)		0.138 (0.126)				
Population (logged)	0.584*** (0.0756)	0.624*** (0.0851)	0.549*** (0.0819)	0.543*** (0.0778)	0.579*** (0.0802)	0.713*** (0.0970)
<i>Convenience Factors</i>						
Business Days			-0.00217 (0.00269)			
Regional Hub				0.437 (0.305)		
British Colony					0.0359 (0.209)	
<i>Political Factors</i>						
Democracy	1.674*** (0.423)	1.697*** (0.422)	1.516*** (0.436)	1.384** (0.457)	1.649*** (0.446)	1.316** (0.447)
Aid Per Capita (logged)						0.365* (0.174)
Constant	-7.851*** (1.279)	-9.352*** (1.904)	-7.138*** (1.453)	-7.063*** (1.343)	-7.777*** (1.347)	-11.36*** (2.105)
N	51	51	50	51	51	51
Pseudo R-sq	0.166	0.170	0.163	0.172	0.166	0.179
Standard errors in parentheses						
+ p<0.10 * p<0.05 ** p<0.01 *** p<0.001						

Table 5: Negative Binomial Regression Analyses: Number of NGOs in a Country (NGOs disaggregated)

	Model 1 # of NGOs Headquartered in a Developed Country	Model 2 # of NGOs Headquartered in a Developing Country	Model 3 # of NGOs Headquartered in Another Country	Model 4 # of NGOs Headquartered Domestically	Model 5 # of Large NGOs	Model 6 # of Small NGOs
<i>Need Factors</i>						
Electricity Access	-0.00930* (0.00383)	-0.0138* (0.00543)	-0.0105** (0.00364)	-0.0115 (0.00735)	-0.00953* (0.00370)	-0.0132* (0.00637)
Population (logged)	0.791*** (0.110)	0.564*** (0.133)	0.749*** (0.101)	0.564** (0.181)	0.759*** (0.103)	0.567*** (0.160)
<i>Political Factors</i>						
Democracy	1.171* (0.479)	1.870** (0.636)	1.110* (0.449)	2.311* (0.914)	1.280** (0.463)	1.671* (0.756)
Aid Per Capita (logged)	0.409* (0.186)	0.245 (0.249)	0.443* (0.176)	0.0375 (0.345)	0.446* (0.179)	0.0945 (0.299)
Constant	-13.17*** (2.355)	-9.717*** (2.929)	-12.39*** (2.178)	-9.586* (3.982)	-12.74*** (2.226)	-9.331** (3.476)
N	51	51	51	51	51	51
Pseudo R-sq	0.206	0.150	0.1965	0.1128	0.1939	0.1224
Standard errors in parentheses						
+ p<0.10 * p<0.05 ** p<0.01 *** p<0.001						

Notes

ⁱ This is particularly true for those living far from power lines, but even where the grid is close, the cost of connecting to it can be prohibitive. In Kenya, for example, Kenya Power and Lighting Company, the sole electricity provider in the country, charges approximately \$500-\$1200 for the act of connecting a new user (20-0612n, 38-0612d, 5-0612r). Citations in the form 0-0000x represent interviews done by the authors, and represent the nth interview of a month-year pair, followed by the a letter representing the type of respondent: a donor (*d*), company (*c*), beneficiary (*b*), NGO (*n*), researcher (*r*), or other individual(*o*). Names are not given to protect the confidentiality of the study's human subjects.

ⁱⁱ DG systems using renewable energy sources such as windmills, solar photovoltaic panels or hydroelectric turbines have become increasingly common, due to decreasing input costs and international environmental concerns. However, diesel generators remain among the most common type of distributed generation system; solar lanterns are also very common.

ⁱⁱⁱ Data from the Union of International Associations (UIA) is not an appropriate measure of our dependent variable. Associations and NGOs are not categorized or registered in the same way in developing countries so the meaning of the UIA data is not transparent. For example, associations in Kenya are registered under the Societies Act, while NGOs (both locally and foreign-headquartered organisations) are registered under the NGO Act, so a list of the associations located in Kenya would not include most of the NGOs in our study.

^{iv} Biogas, however, is more often used for gas cooking purposes than for electricity generation.

^v We define energy NGOs as “implementers” if their activities included carrying out concrete “on-the-ground” projects including the installation and maintenance of energy systems. A

“Capacity building” classification means that the NGO conducts training programs focused on business development, installation, and system maintenance, as well as the development of supportive local institutions, including market institutions.

^{vi} While it would be ideal to include a measure of DG private sector activity in a country, or even a measure of total private sector activity, the authors were not able to locate such variables. We considered the World Bank’s Ease of Doing Business index, as well as a number of other potential measures of private sector activity (e.g. domestic credit to the private sector, export value index, etc.), but chose the time it takes to start a business because it was the most theoretically salient measure. This decision also allowed us to use data from the correct year in relation to our dependent variable, and it had the lowest number of missing observations for Africa.

^{vii} Even though road density was the best and most complete measure of infrastructure, the variable was missing observations for 13 countries. If we included this variable in the model, our sample would drop to only 40 cases. When included, road density is not statistically significant at any conventional significance threshold.

^{viii} We transpose Freedom House scores such that the degree of liberalization increases as numbers increase.

^{ix} We also estimated a model in which we interacted electricity access with population. The inclusion of this variable did not substantively change other results but this variable is statistically significant at the 1 percent statistical significance threshold. This result implies that NGOs are less likely to locate in countries with higher populations and higher rates of electricity.

^x When GDP per capita is included in a model without electricity access, the relationship is both negative and significant. We find similar results using NGOs per capita as the dependent variable, rather than a raw count of NGOs.

^{xi} Model results available upon request.

^{xii} Four of the developing country-based NGOs in the database are headquartered in India; the rest are based in Africa.

^{xiii} Several NGOs list multiple countries as housing their headquarters, and are therefore included as “domestic” organizations in more than one country.

^{xiv} See endnote 1 for an explanation of interview coding.

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Appendix: Sources of Data and Database Construction

Original Database of NGOs

Few accurate databases – or even counts of organisations – exist on NGOs {Watkins`, Swidler`, and Hannan`, \, 2012 #1252}. In order to assess NGO involvement in energy programs throughout Africa, we therefore compiled an original and comprehensive database of 206 NGOs operating in 53 countries of Africa.¹ We used a multi-pronged approach: we consolidated existing online NGO lists; collected NGO contacts from relevant international organisations; and conducted an extensive online search. Using information from the NGOs' websites, we gathered details on the country location of each organisation's headquarters and programs. We also collected descriptions of the organisation's programs and roles, the type of energy generation implemented, whether DG is the organisations' primary focus, and whether the organisation has an active website. Here, we briefly explain the process of database construction.

To begin, we consulted online lists of NGOs that are involved in development and environmental projects in developing countries and extracted those that were involved in DG. These lists included the Global Environment Facility's (GEF) NGO network, NGOs accredited by the United Nations Framework Convention on Climate Change (UNFCCC), and NGOs included in the Renewable Energy and Energy Efficiency Partnership (REEEP) database. We also corresponded with contacts at the World Bank, the United Nations Environment Programme (UNEP), the regional development banks, and the United States Agency for International Development (USAID) for additional lists of energy NGOs.

While the aforementioned lists and contacts were essential in the NGO compilation process, a systematic Internet search identified most of the NGOs included in the database. Each

search included, in order, the African country name, a type of energy source¹, and “NGO.” For non-English speaking countries, we conducted the search in both English and the official language (French, Portuguese, Spanish, or Arabic). We carefully read through each search result on each of the first five pages of results for each set of search terms, clicking not only on NGOs’ own websites, but also news articles, blog posts, or reports from government, NGOs, or development agencies. If, for example, we found mention of an NGO in a newspaper article, we then followed up with a search for that specific NGO. We thus employed a web-based snowballing approach to data collection. From August 2011 to May 2012, we examined approximately 50 webpages for each of the 10 search terms per country – a total of over 20,000 unique web pages.

Once an organisation was identified, it then had to meet specific criteria to be included in the database. First, the organisation had to qualify as an NGO. While many definitions of NGOs exist, we based our classification on self-identification as an NGO, nonprofit status, and public-oriented activities of development, welfare, charity or research. If the organisation met these criteria, we subsequently designated them as “DG NGOs” if the webpage explicitly mentioned any type of distributed generation projects.

We acknowledge here the potential limitation of this type of online search since Internet penetration is relatively low across Africa.¹ It is possible that this research strategy led us to leave out a number of organisations. In particular, the Internet-based search may have excluded particularly small organisations or those not seeking an international audience. Given that most NGO funding in Africa comes from international sources {Brass, 2012 #191}, however, and that most international organisations have a web presence, we believe that we have captured the vast majority of NGOs.

Case Studies and Secondary Source Data

To complement the information obtained in the NGO database, we drew on data previously collected in a random selection of 60 case studies of DG projects implemented in developing countries around the world, published in English in peer-reviewed journals between January 1995 and September 2011 {Brass`, Carley`, Maclean`, and Baldwin`, \, 2012 #1238}. We also examined documents produced by donors, NGOs, governments and private companies working in the energy sector. These secondary source materials provided useful background information on DG's role in development generally, as well as specific examples of implementation of DG programs.

Field Research in Case Study of Kenya

Because neither the cross-sectional NGO database, nor the secondary sources provided insights about changes over time or the motivations of NGO leaders, we decided to conduct field research interviews in one case study country. Such conversations allow us to understand mechanisms that may explain or help us interpret our regression analysis findings. We chose Kenya because the greatest number of NGOs chose to locate there. We conducted approximately 40 interviews with 60 respondents in over a dozen cities, towns and villages in Kenya in June 2012. Our respondents included not only NGO leaders, but also Kenyan government officials, multi-lateral donors, business executives, researchers, CBOs, as well as individual Kenyan end-users. Interviews were semi-structured in format, and lasted between 20 minutes and two hours. Respondents were asked about their organisation's DG programs or products, the motivation for these programs, their choice of location, government policy that affects DG, and their own use or experiences with DG.

Approximately one-third of interviews were conducted with NGO representatives, with the distribution of interview respondents shown in Figure 1 below. We attempted to contact representatives of all 47 DG-NGOs listed in our database, and we met with approximately 10 of them. We did not meet with the other 37 organizations because they did not have a country office in Kenya, were not based in the capital, Nairobi, or one of the other towns that we visited during our field research trip, or if they did not respond to our attempt to contact them. Approximately 60% of the NGO representatives interviewed were in the NGO database. The remaining 40% were discovered through snowball sampling. They were primarily very small NGOs running schools or children’s homes that have done DG programs.

Figure 1: Distribution of interview respondents

