THE PARADOX OF POWER: CONNECTION, INEQUALITY, AND ENERGY DEVELOPMENT ON TUMBATU ISLAND, ZANZIBAR

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Recent power outages on the Zanzibar archipelago have drawn attention to the potential for small-scale alternative energy development, but those programs present their own challenges and dilemmas. Using the example of a solar development project on Tumbatu Island and the subsequent connection of the Island to the national electric grid, this article considers the paradoxical outcomes of electrification. It explores how both solar electricity and connection to the national electric grid created contradictory processes of connection and autonomy and reinforced hierarchy and differentiation on a local and global scale. (Solar power, electricity, development, Zanzibar)

In May of 2008, the entire Zanzibar archipelago lost power when a surge destroyed the underwater cable supplying electricity to the main island of Unguja from the Tanzanian mainland. While power outages are frequent throughout Tanzania and Zanzibar, this event caused a shocking four-week blackout while engineers awaited replacement parts for the Norwegian-designed utility station. The cable was eventually repaired, but only temporarily. In December of 2009, the cable was again damaged, and Zanzibar lost power once more. This time, three months passed before electricity was restored.

These power failures caused widespread hardship and suffering, especially in Zanzibar City, an urban center of approximately 250,000 people. Electric pumps supply water to homes, hotels, and other businesses, and computers are integral to many businesses and government offices. Diesel generators provided the most common source of power during the outage, but few citizens could afford the increasingly expensive fuel. Most were forced to go without power. Food rotted in warm refrigerators; hospitals turned off nonessential services; the price of bottled water rose dramatically; and long-distance communication became problematic as cell phones died and computers were turned off. The lack of electricity was also a major setback to Zanzibar's tourist-dependent economy. On a broader scale, the power crisis accentuated the fragility and vulnerability of Zanzibari infrastructure, the energy concerns of Zanzibar, and, indeed, all of Tanzania.

Yet, many of the outlying areas in Zanzibar are not connected to the central power grid, and for them the extended power failure was noteworthy

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but hardly devastating. In fact, the electricity crisis drew attention to the potential of alternative energy developments, especially solar power initiatives. An ongoing solar development project on the Zanzibari island of Tumbatu is one such program. Projects, such as the introduction of solar panels in Tumbatu, potentially offer environmentally, economically, and politically appealing alternatives to state-controlled utilities. However, located within the complex framework of international development, such alternatives often have their own problems. The solar project brought electricity to the small island, but the tangible benefits of solar power were compromised by the qualifying conditions of the project, conditions which reproduced global and local inequalities. At the same time, the subsequent connection of Tumbatu Island to the troubled national electricity grid presented residents with the choice between two power options, each provoking critical questions of autonomy, connection, and hierarchy.

Based on ethnographic research conducted in 2004–2005, 2008, and 2011, this article considers the paradoxical outcomes of the introduction of solar electricity and the subsequent extension of the central Zanzibar electrical grid to the village of Jongowe on Tumbatu Island. As part of decentralizing trends in development, the electrification of Tumbatu involved projects conceived and implemented through overlapping structures of state and non-state power. While both solar power and electricity from the national grid were generally positively received, they were not equally distributed or uniformly experienced. Electrification both connected and excluded people, and in the process it highlighted competing interpretations of development.

TUMBATU ISLAND

The electrification of Tumbatu is a particularly significant event, given the political history of the island. Tumbatu is a low, coral-rag island off the northwest coast of Zanzibar's main island, Unguja. It is approximately 7 km in length and 1.5 km in width. Currently, there are two settlements on the island: the town of Kichangani (also called Gomani) on the northern end of the island, and the village of Jongowe toward the southern end of the island. I lived in Jongowe in 2004 and 2005 while conducting dissertation research on community-based conservation programs, and made brief return visits to the village in 2008 and 2011.

The island of Tumbatu is an exceptional place in many ways. While it is the third largest island in the archipelago, behind Unguja and Pemba, its two communities are rarely visited by outsiders. Many mainland Tanzanians have no idea where Tumbatu Island is, and might not even be aware that it exists. If you mention to Zanzibaris that you are going to Tumbatu, most will react with

surprise and admit that they themselves have never been there. The invisibility of Tumbatu Island is not an accident of geography or an indication of the unsociability of the Tumbatu people (though both have been offered as explanations), but is the result of a deliberate process of political and economic marginalization and isolation. It is also a relatively recent state of affairs in the history of the Zanzibar archipelago.

The Tumbatu, along with the Hadimu and Pemba, are considered the "indigenous" people of Zanzibar. Archeological evidence indicates settlement on Tumbatu as early as 2,000 years ago, with the largest sites located near Jongowe at Makutani (Ingrams 1931; Khator 1992). While there are different theories about the origins of the original Tumbatu inhabitants, the "dynastic link" of the island's residents to the Shirazi is evidenced by the architecture of the early mosques (Juma 2004). Historically, the island of Tumbatu held a significant regional economic and political position. By 1100 AD until around 1300 AD, Tumbatu was a "higher order" state center in Zanzibar, involved in trade with other major city-states in the Indian Ocean, and from 1150 AD to 1250 AD, the town of Jongowe was one of the largest settlements on the Zanzibar coast (Horton and Clark 1985).

When the Portuguese arrived in Zanzibar in the sixteenth century, Tumbatu was still regionally important; but by the time of Omani Arab colonization of Zanzibar in the late 1700s, the power of Tumbatu had greatly diminished. In 1840, the Sultan of Oman moved the capital of his Sultanate to Zanzibar. Oman ruled Zanzibar until 1890, when Britain declared a formal protectorate over the island. During this time, the people of Tumbatu were able to remain relatively independent because of their distance from the capital and the fact that the poor quality of their land precluded the plantation farming pursued in central areas of Unguja (Clayton 1981).

In the later years of colonialism in Zanzibar, racial identity became increasingly politicized, and the growing tension between Arab and African residents (many of whom had migrated from the mainland) was exacerbated by the British support of Arab rule. The slim victory of an "Arab" political coalition in elections in 1963 was followed by the formal transfer of independence in December of that year. Yet, the rule of the coalition was short. In January of 1964, a violent revolution led by members of the Afro-Shirazi Party (ASP) overthrew the elected representatives and established an alternative government. The days, weeks, and months following the revolution were marked by violence and retributive killing. Non-ASP dissidents and Arab residents were killed and Arab houses and businesses destroyed. Most surviving Arab and Asian residents fled. Within months, the new Zanzibar government unified with the mainland to form the nation of Tanzania (Clayton 1981; Lofchie 1965; Hunter 2010).

For residents of Tumbatu, as for all Zanzibaris, the events of this time are vividly remembered. While Tumbatu residents were split between the political parties, one of the original coalition parties won the most support on the island in the last pre-independence poll (Myers 2005). In the widespread violence following the revolution, the island's opposition supporters were harassed, property was seized or destroyed, and many were killed or forced to flee to mainland Tanzania. Even after the initial violence subsided, subsequent years brought more harsh treatment for the residents of Tumbatu, especially for the villagers in Jongowe. Following a supposed assassination plot on the first Revolutionary President, Abeid Amani Karume, in 1969, many of Jongowe's residents were imprisoned or tortured (Myers 2005). While Zanzibar has not seen the same level of violence and unrest that marked the early revolutionary period, the general attitude of the Revolutionary government toward Jongowe has until recently been one of passive neglect.[1] Thus, the opportunity to participate in a solar energy project introduced by an American non-governmental organization (NGO) in 2007 was enthusiastically embraced by village leaders.

Villagers in Jongowe remain acutely interested in the turbulent political events of today. Since the first multiparty elections in 1995, the ruling party has been Chama cha Mapinduzi (CCM, Party of the Revolution). Their closest political challenger is the Civic United Front (CUF). These parties are often perceived to fall along the same historical ethnic lines, with CUF associated most strongly with Pemba and former "Arab" strongholds. In Jongowe, where the memories of the post-revolution violence linger, CUF is widely supported, though some residents are active members of CCM. In the contentious elections of 1995, 2000, and 2005, CCM's decisive victories led to accusations of fraud and vote-rigging in Jongowe and across Zanzibar, and in some cases by outside observers.

Given the rancor historically surrounding politics on the archipelago, it was striking when, in July of 2010, Zanzibaris approved a power-sharing arrangement in a referendum. Following close elections in November of that year, a new Government of National Unity (GNU) took office, with the CCM candidate as President of Zanzibar and the CUF candidate assuming the post of First Vice President. In Jongowe, these developments were viewed hopefully but with a healthy dose of skepticism. That hope was in some ways validated when, in December of 2010, the island of Tumbatu was connected to the Zanzibar national electrical grid.

DECEPTIVE ISOLATION

Many people, on and off Tumbatu, suggested to me that the historical lack of development in Jongowe is in part a result of their past and current support for the political opposition. Zanzibar struggles economically in general, but in the decades since the revolution, Jongowe has not received the development and improvement projects that have been introduced (if sporadically) on Unguja.[2] Tumbatu has no roads[3] or cars, a sporadic water supply piped under the ocean from Unguja, and until recently, no electricity.

While there are political divides in the village, the collective social identity as Jongowe residents supersedes political affiliation. A strong place-based identity is common in Zanzibar, where there is an adamant chorus of cultural autonomy from mainland Tanzania. This fervent claim to identity is amplified in Jongowe, where residents are quick to distinguish themselves from even their Kichangani neighbors on Tumbatu. As Myers (2005) explains, the place he calls both "wonderful and unsettling" instills the sense of being abandoned by both political parties, contributing to a persistent "us and us only" ethic of self-liberation.

The idea of self-sufficiency is an important value in Jongowe, but it is often perceived in an extreme fashion by many non-residents. One of the most persistent assessments of Tumbatu from outsiders is that residents are isolated—and remain isolated by choice. Khator (1992) claims:

> Tumbatu Islanders maintain they are distinct from other races of East Africa, and they do not encourage other people from outside to settle in their homeland. To maintain the conservatism a young Mtumbatu is not expected to marry an outsider; that is why it is hardly possible to see people from the main island living on the island. Even Arabs and Indians are not interested at all to establish shops on the island.

A characterization of self-imposed isolation does not reflect the welcome I received or the conditions I have observed in Jongowe. While there are no non-African residents in the village, many men do marry non-Tumbatu women, in part as a response to the exodus of young, educated Jongowe women from the village to work in town. Further, though their island is relatively distant from today's major urban centers, the residents of Tumbatu have never been completely isolated, but for centuries have actively engaged in trade and travel.

In spite of its relative "remoteness," the residents of Jongowe, particularly male residents, are keenly interested in world events and have an intense sense of connection to the rest of the world. They are fishermen and travel widely following fishing seasons. While in the village, a sense of connection is apparent in the insatiable appetite for news, either through radio or from those

returning from Zanzibar City. Men gather in groups and listen to the radio every night, engaging in political discussions about the rest of the world at a level of detail that is sometimes disconcerting. During my stay, I heard or participated in conversations ranging from the death of the Pope to the elections in Britain, the wars in Iraq and Afghanistan, and the recent earthquake in Japan. As one example of how attuned residents are to world events, in response to news coverage of a political speech by the former U.S. Secretary of State, Condoleezza Rice, one man asked, "Condoleezza Rice, she is a black American, right?" and was answered, "She is black, yes, but I think politically she is really white."

Local news is transmitted in a less technical but equally effective manner, either through local social networks or via a "town crier." When there is news that needs to get around to the community after dark, when people are in their homes, a boy runs through the village beating a drum (or bucket) and stopping periodically to shout the news. He may, for example, announce that because of the increasing price of gas, the price of a ride on the one motorized boat making one round trip per day to the mainland will increase.

The spread of information is important, but Jongowe's connections to the rest of the world extend beyond radio waves and word of mouth. In spite of the residents' impression of being forgotten or left behind by government, Jongowe receives many political visitors. During the build-up to the 2005 elections, admittedly an unusually active time, several candidates for Parliament campaigned in the village, as did the CUF mainland Presidential candidate. The Minister of Education came and gave a speech at Jongowe's one school. Other government officials at the district and regional level visited Jongowe for a variety of celebrations or, for example, an HIV/AIDS conference held while I lived there. There was a constant stream of health workers throughout the village, addressing concerns including malaria, elephantiasis, and physical impairments. The guestbooks of the village's *sheha* (political leader) and the village conservation organization, the Jongowe Environmental Management Association (JEMA), contain the signatures of many important political figures and foreign visitors.

DEVELOPMENT IN ZANZIBAR

In spite of these varied and long-term connections, and a proud sense of their distinctive collective identity, it is often development, or lack of it, that Jongowe residents reference when discussing their position in the world. Yet, development, or *maendeleo* in Swahili, is never a straightforward idea. Complex and controversial, development is inevitably contested and interpreted differently by different actors, both within and outside the village.

Anthropologists have discussed at length the disillusionment with modernist versions of development, in which so-called "first-world" countries have set the linear path that "third-world" countries must follow in order to "develop" (Ferguson 1994; Escobar 1995; Gardner and Lewis 1996). Critics argue that such approaches reproduce ethnocentric assumptions and suggest technical solutions to conditions of poverty, while concealing the role that broader structures of power, including development agencies themselves, may have in creating and perpetuating inequality (Ferguson 1994). Though monolithic approaches suggested by "grand theories" such as modernization have largely fallen out of favor within international development circles (Gardner and Lewis 1996), many of the concerns about the continuation of power imbalance and inefficacy of development projects remain (Haugeraud and Edelman 2007; Smith 2008; Li 2007; Mosse 2004; Ferguson 2006; Bornstein 2005; Tsing 2004; Crewe 1999; Farmer 2004).

Recent widespread policy changes in the field of development have included more participatory approaches (Chambers 1997) and the inclusion of non-governmental players. Cumulatively, these are part of decentralizing trends in development, trends which seek to address some of the shortcomings of "top-down" development approaches, while also bypassing potentially corrupt or inefficient government structures, to focus on local civil society (Hearn 2001; Ferguson 2006; Benthall 2000; Lewis 2002). Specifically, in the past 20 years Africa has witnessed the growth of a dynamic NGO sector charged with carrying out development programs. In this new vision of development, civil society, most obviously in the form of NGOs, plays a crucial role in empowering citizens at a local level by giving them the tools to work beyond national borders. Though states are by no means obsolete in the new development paradigm, the emerging coalition of civil society agents—operating locally or transnationally—highlights a pattern in which multiple levels of organization merge and become significant, and governance is no longer the purview of states alone (Ferguson and Gupta 2002).

However, clear distinctions between civil society and the state in development are simplistic and problematic, and this is particularly true in Tanzania and Zanzibar. Both Tanzania and Zanzibar require national NGOs to register with the government and be approved before they can begin operations. The central government, then, has ultimate control over who may participate in civil society and in what capacity, and the government may also suspend the operation of any NGO perceived to be challenging or undermining the authority of the state. Further, in Zanzibar many state agencies or government projects are run with funding from transnational NGOs or bilateral agencies (Dean 2007). For example, the World Wildlife Federation (WWF) funds projects in the Fisheries Department, especially the Menai Bay Conservation

Area, while CARE helps the Forestry Department with the management of the Jozani National Forest. The Finnish government provides extensive support to the Sustainable Management of Land and Environment (SMOLE) program, a cooperative of three separate government departments, while the government of Norway has an ongoing partnership with the Zanzibar Electricity Corporation (ZECO), a Zanzibari state organization. Thus, the context for development projects in Zanzibar involves an ambiguous and shifting mix of national and international state and non-state entities.

Yet, understanding the complexities of development requires exploring not only how power and governance are constituted at the state and international levels, but how projects are interpreted and experienced at the local level. As Walley (2004a) found in her exploration of an emerging marine park on the Mafia archipelago of Tanzania, development was conceived of by residents as a comparative idea, a lack of something in relation to others. Similarly, Smith (2008:4) notes that in Kenya development is a "relational concept that entails comparing one's condition to an ideal representation of other places and times." In this sense, "to get development" (*kupata maendeleo*) is to approach an idealized life that is believed to exist elsewhere. This understanding of development is inexorably imprecise, and Caplan (2004), also working on Mafia, joins Walley (2004a) in questioning, "*Maendeleo gani*?" (What kind of development?). Contrasting rural residents to urban residents, she explores how development means different things to different people. Individuals' experience and interpretation of development as a broad idea or as specific projects depends on their personal situation, and on their relative social access to the available resources. "Such interpretations continue to occur within broader contexts of power in which 'development' serves as a language of social class operating across both national and international terrains" (Walley 2004b:77).

In Jongowe, the introduction of electricity was embedded in the complicated and convoluted structures of power produced by the activities of NGOs, the Zanzibari state, and international aid partners, and was subject to competing interpretations by village residents. Beginning as a solar project with an American NGO and continuing as a centralized project with ZECO and its Norwegian partners, the introduction of electricity addressed what villagers perceived as a lack of development in relation to other places, but it was not uniformly received or understood. Electrification provided benefits for some people, but those benefits were unequal and contested. It also provided opportunities for connection within and outside the village while simultaneously institutionalizing processes of exclusion. While in some ways addressing an inequality between "developed" and "developing" places, the

projects which brought electricity to the island also reproduced and intensified existing hierarchies.

THE INTRODUCTION OF SOLAR ELECTRICITY

Though there are many connections between villagers in Jongowe and those outside the village, there is still a perception among the residents of being economically and politically marginalized, a perception strongly supported by village conditions. When I first arrived in 2004, residents frequently pointed to the lack of electricity as a tangible indicator of Jongowe's impoverishment. At that time, there was a large solar panel donated by a German NGO on the central mosque and another on the school roof. While these powered small lights, more significant energy needs required a generator. Residents used smoky, small, metal containers of kerosene with a wick for light in their homes, and relied on batteries for their radios and jerry-rigged battery-pack "chargers" for cell phones.

However, in 2008 things began to change. An American NGO initiated a domestic solar electrification project and equipped ten houses with demonstration panels. More panels had been brought and were awaiting installation. In the houses with the solar systems, radios played and lights burned into the night. Instead of studying by the smoking kerosene lamps, students were able to read and write under bright florescent lights. Though there were some complaints about parts missing or failing, most people were positive and optimistic about the new solar project. By early 2011, approximately 70 homes in Jongowe had solar panels installed.

The introduction of solar electricity in rural Zanzibar is an example of "leapfrogging," bypassing conventional sources of energy production, such as coal or oil, and moving directly to more efficient and environmentally friendly technologies. Solar technology is popular among environmental groups and major development organizations because it has the potential to address both environmental and rural poverty concerns. The Tanzanian government is exploring options for developing solar energy, along with other renewable energy technologies (RETs), but at present, solar energy contributes less than one percent toward the country's energy demands (Kassenga 2008). Unlike its neighbor, Kenya, where market-based rural electrification with solar systems is widespread (Jacobson 2007), Tanzania's limited solar development is mainly sponsored by international donors and NGOs (Kassenga 2008).

The solar panel project in Jongowe was described by the donor through a rhetoric of exchange. While many international development or aid projects offer "gifts" with hidden obligations (Stirrat and Henkel 1997), the reciprocal

expectations of this project were clear from the outset. As the president of the NGO bringing the solar panels to Jongowe repeatedly announced during a workshop for village technicians, "This is a new model of development." He later explained to me that what he meant was that villagers "don't get something for nothing" with this program. Specifically, in exchange for the solar panels, villagers were required to build fuel-efficient stoves to replace their traditional stoves. Project coordinators calculated that each fuel-efficient stove was worth approximately $25 in carbon credits over its lifetime. Each household that built a stove was thus entitled to a $25 discount on a $100 solar panel. Since few households in Jongowe could afford the $75 price tag, the standard arrangement was that the NGO provides one solar panel to the village for every four stoves built. Thus, in providing solar electricity to Jongowe, the NGO required residents to participate in their carbon-reduction program. But only one out of four households that participated by building the new stoves received a solar panel.

Jongowe residents accepted these conditions. Indeed, wood (for fuel) is in short supply on Tumbatu, so measures that reduce its use are beneficial locally. Further, after decades of politically motivated neglect, Jongowe residents welcomed the influx of decentralized development projects sponsored by foreign NGOs and bilateral donors. The solar-panel project is one of many current projects in the village, and most require some degree of community participation or "contribution" (Chambers 1997; Cooke and Kothari 2001). That "strings" were attached to acquiring solar panels was not extraordinary, and, in fact, fit into standard practices of development-based exchange in Jongowe.

However, since only one household out of four that were building stoves actually got a panel, the distribution decisions had to be made carefully. For the first 20 systems installed, the council of village elders (*baraza*) decided who received panels. They were distributed geographically throughout the village (five in each of the four sub-villages). By determining the location of the solar panels, village leaders not only defused potential disputes between neighbors, but also maintained their communal authority over a technology which ultimately empowered the individual household. Thus, at the initial stages of the project, the solar systems were considered collective goods to the extent that there was some centralized coordination of their distribution. After the initial 20 panels, however, residents used a lottery system between the four households to decide which home received a panel. While elders still oversaw this process, they did not make the final allocation.

THE INTRODUCTION OF ELECTRICITY FROM THE NATIONAL GRID

In late 2010, as part of a long-term electrification project sponsored by the Norwegian government, an electric cable was run across the channel from Unguja to both villages in Tumbatu, and in December Jongowe residents were connected to the central Zanzibar electric grid. While Tumbatu was part of the master plan for rural electrification in Zanzibar, Jongowe residents were still quite surprised by the event. Indeed, the enthusiasm for the solar project was premised on the assumption that, given the village's history of marginalization and contentious relationship with the Zanzibari government, Jongowe would never be part of the national grid. When I reminded people of that skepticism during a visit in 2011, everyone emphasized that while the new unity government might deserve some credit, the grid was also the work of Norwegian engineers and planners, and not just the government-owned ZECO.

Unlike the NGO-sponsored solar panels, the power from the national grid was available only to those residents who could afford to pay for their homes to be connected (the equivalent of around $200 during the initial installation period but more expensive for subsequent installation) and keep up with the monthly cost. While a few of the first homes were given meters, the standard arrangement was a pre-pay box that required customers to buy vouchers for a certain amount of electricity credit, in the same manner as a pre-pay cell phone.

Although electricity from the national grid could jeopardize the solar project in the future, at present residents use both sources of power concurrently. They distinguished between the different forms by using the English term "solar" for energy produced by the solar panels and the Swahili term for electricity, *umeme*, for energy from the electrical grid, a convention followed in the remainder of this article. In March of 2011, of the approximately 400 homes in the village, around 70 had solar panels installed and about 50 had umeme. However, many (perhaps even most) of the homes with umeme also had solar panels, so the actual number of homes with power in the village was still rather small. When asked about the differences between the two, residents usually distinguished between both the cost and the uses of solar and umeme. The solar panels were ostensibly free, but they did require an initial labor investment to make the stoves and ongoing maintenance, while umeme had steep upfront expenses and ongoing cost. The solar batteries could hold only enough charge to power a light and charge a cell phone or a radio, while the households with umeme could run more lights and larger appliances, most commonly irons or fans. I knew of two electrified homes with television sets and one with a DVD player, but there were none with computers.

The introduction of umeme was overwhelmingly viewed as a positive development by villagers I spoke with after the first months of electrification, but there were some who expressed reservations. A few people were afraid of it, especially the potential for electrocution or fire. During the spring preparation of the fields for planting, there also were ongoing discussions about whether it was safe to burn the fields beneath the power lines. One man was skeptical about the actual benefits umeme could bring and told me that he was not in favor of umeme because it made the village more reliant on the Zanzibari government, a point explored in the following section.

POWER AND HEIRARCHY

Whether sponsored by foreign NGOs or initiated by a national government, development projects are inevitably about the relative distribution of power and resources. Both the solar panel project and the extension of the national grid created, maintained, or reorganized the hierarchical relationships between Jongowe and the Zanzibar state, Jongowe and the NGO, and between the residents of Jongowe themselves.

The parameters of the solar project were explicit in that the relationship be reciprocal: the American NGO gave solar panels; the villagers received them, and in exchange built fuel-efficient stoves. Once the initial expectations of reciprocity were fulfilled, the relationship would be ongoing with more solar panels distributed and more stoves built. The quid pro quo was to have the stoves produce the environmental benefit the NGO desired (less carbon released into the atmosphere), and, significantly, it gave them what those stoves represented: evidence of a successful development project. The NGO could use the stoves as promotional material to solicit more donations for their program. The exchange created a relationship between the village and the NGO, and also between the NGO and its sponsors.

Yet, in the relationship between the NGO and the community, the rhetoric of reciprocal exchange for items of equal value (one solar panel for four stoves) concealed the perpetuation of imbalanced structures of power. Project parameters obligating villagers to do something the NGO believed to be a social good in exchange for solar panels were clearly paternalistic and underscored how the NGO, not the community, was structurally positioned to control the project. Africa as a whole is one of the lowest carbon-emitting regions in the world while the United States is one of the highest (Canadell, et al. 2009), yet in this project the American NGO required villagers to participate in a carbon-reduction program in order to receive solar panels. Bornstein (2005) describes how charity and development institutionalize the conditions of privilege and need they purport to address. In this case, the exchange of

stove for panel was not an even one, but an exchange which reproduced an unequal relationship by favoring the donor's priorities. The hierarchy of giver and receiver was affirmed over and over again, each time mandatory stoves were inspected and approved and the solar panels were benevolently distributed.

Significantly, the conditions attached to the project also reproduced inequality within the village itself. Though the solar panels were in a sense free, the requirement of building stoves to receive them necessarily limited who could participate. The material to build the fuel-efficient stoves is not available on Tumbatu, but must be sourced from mainland Zanzibar. This means that those who could not travel to obtain the material or send someone to do it in their place could not hope to have a solar panel through the program. This disparity was most visible along lines of age and gender. The vast majority of those with panels were households headed by younger men, as older men (*wazee*) were unable to collect the building materials. Gender was also a central factor in solar panel distribution. In this Muslim and strictly gender-segregated village, most women could not travel to obtain the materials needed to build the stoves. According to a project coordinator in the village, aside from the panels distributed by elders during the initial phase of the project, by early 2011 only one panel was received by a woman.

While the project parameters by themselves perpetuated existing social distinctions, some residents also manipulated the expectations of the project to their benefit. For example, though the ownership of the panel was decided by lottery among the four houses that built stoves, a disproportionate number of the better-off members of the community had panels in their homes. This happened because some more affluent and able-bodied individuals guaranteed they would be the ones to receive a solar panel by collecting enough building materials for four stoves, which they then built in the homes of neighbors and relatives, with the understanding that they would get the panel regardless of the lottery outcome. Further, a few individuals in the village had enough money to purchase the solar panels directly from the NGO, bypassing the stoves altogether.

Additionally, while some of the households receiving solar panels were among the poorest in the village, the residents of those homes did not have the means to maintain the solar systems by replacing the battery or by refilling it with costly acid. Thus, many of the poorer households had solar panels that were no longer functioning. As one man who had worked with the solar NGO ruefully put it, "I think they are back where they started." Although solar electricity does have egalitarian potential, this project exacerbated rather than ameliorated existing inequality.

The transactions involved in receiving umeme from the national grid were more straightforward. Residents paid to connect their homes and power their appliances, or they did not pay and were not connected. In this way, umeme clearly demarcated economic differences within the village. While the distribution of solar panels mapped those who had the resources to build fuel-efficient stoves, the connections to the electrical grid correlated directly with income. Those with umeme were mostly teachers and civil servants, people earning dependable wages, as opposed to fishermen, the main occupation for village men. Walking through the village, the wealth disparities are made apparent by the wires connected to homes in the day and the bright light spilling out of electrified homes at night (Winther 2011). Most homes in Jongowe are ongoing projects, with some rooms only partially constructed, so aside from the distinction between traditional limestone homes and cement block homes, wealth differences were not obvious in construction. Umeme, however, clearly revealed a pattern of economic stratification.

Winther's (2011) ethnography of Uroa, a town on the east coast of Unguja Island, describes how electrification through the national grid extended the reach of the central Zanzibar government and also dramatically changed ideas of public and private space. For example, the arrival of the utility's meter reader every month disrupted private space, and the ritualized payment of electric bills at the main party office created a new type of public space. Because most of the electrified homes in Jongowe use the pre-pay box, this intrusive relationship with the government was not as obvious. However, umeme did create a new connection to the Zanzibari state, and, further, once umeme was in the home it became a social "thing" (c.f. Appadurai 1986). The following section considers how both solar and umeme functioned as both connective and disruptive technologies in Jongowe.

CONNECTION AND SEPARATION

Ferguson (2006) asserts that Africa's experience with development is unique because of the simultaneous connection and disconnection of the continent to the rest of the world. Africa's relationship to the world, he argues, is characterized by tenuous, isolated links and nodes of connection "combined with widespread disconnection and exclusion." For countries of Africa, there is no "unfettered connection" with the rest of the world, but instead a set of differential "social relations that selectively constitute global society" (Ferguson 2006:14). Thus the contradictions of concurrent connection and isolation, ideas so important for how Jongowe residents understand their relationships with each other and their place in the world, fall into what Ferguson sees as a larger pattern for the continent. These contradictions are fascinating

to consider within the context of energy development, as the introduction of electricity makes physically tangible the abstract metaphors of connectivity and exclusion distinguishing broader experiences of modernity and development (Ferguson 2006; Piot 1999; Comaroff and Comaroff 1993). The introductions of both solar and umeme have added new layers of complexity to the possibilities for connection within and outside the village, and they have also deepened and exacerbated divisions. For residents of Jongowe, an appeal of the household solar project was not only the relationship created with outside donors but the freedom solar energy implied—specifically, freedom from the resource-strapped and politically volatile Zanzibari government. Umeme, however, implied the opposite; that is, being linked to the national electric grid was a physical and symbolic connection to the rest of Zanzibar.

In many ways, domestic solar systems represent the definitive form of decentralized development. Once the panels are installed, they require minimal maintenance (although, as described, even this is beyond the capacity of the poorest households). Homeowners do not need to rely on a national electrical grid or even a community network. As long as there is sun and the components continue to function correctly (admittedly a big assumption) households will have electricity. Several project participants and members of the village council told me that this potential for self-sufficiency was a major factor in Jongowe community leaders' eagerness to participate in this project. In fact, the American NGO distributing the solar systems first approached Kichangani, the other, larger village on Tumbatu, to pilot the project, but the sheha refused. A pair of young environmental activists from Kichangani informed me that their village had a better relationship with the central government than Jongowe, and the sheha believed they would get electricity from the mainland. Jongowe's leaders had no such expectation. The sheha of Kichangani was proven correct in his prediction for electrification, but not before he reconsidered and a similar solar project was begun in that village as well.

So, the energy independence suggested by household solar electrification was part of the appeal to residents of Jongowe, but even before the electrification of the village, the project was paradoxical in its outcomes. At the same time that the solar panels were offering a form of independence, they intensified Jongowe's relationship with the development NGO, a relationship that reproduced their disparate positions of power. But, solar power also effectively increased Jongowe's connection to the rest of Zanzibar and East Africa. Studies of solar projects in Kenya (Jacobson 2007) and Zambia (Gustavsson and Ellegard 2004) have suggested that residents with solar electricity tend to favor the purchase of "connective" technologies such as radios and televisions over "productive" technologies such as water pumps. The solar systems installed in Jongowe connected to florescent bulbs, which greatly facilitated

studying for youth and evening meal preparation for women. Other than lighting, they were predominately used for "connective" purposes, namely for radios and charging cell phones. While Jongowe has never been the isolated place it is reputed to be, the introduction of solar power certainly made it easier for Jongowe residents to connect to people and events off the island (c.f. Jacobson 2007).

The introduction of umeme has created even more possibilities for connection, though without the parallel promise of independence. First, there is the literal, visible connection of the electrical wires marching across Tumbatu, branching off to individual houses, and linking them tangibly to the power supply of mainland Zanzibar—which is actually the power supply of mainland Tanzania. It is impossible to not notice these obvious links to the utility off the island when walking through the village or the fields. Electrification also created a new relationship between villagers and the state, that of customers and supplier. Finally, the "connective" possibilities of solar electricity are multiplied by the greater wattage of umeme; not only phones and radios, but televisions, DVD players, and eventually computers with Internet connections can offer news, entertainment, and dialogue with the rest of the country and the world.

The paradox of both separation and connection is also apparent among the residents of Jongowe, and in this case solar and umeme each create opportunities for both unity and division. Though the conditions of the solar project were problematic in some ways, they did require cooperation among households. Four houses built the fuel-efficient stoves, but only one of them received the reward of a solar panel. The individualized benefit did not correlate with the collective work required, and therefore, at the community level the project required careful negotiation about the distribution of the household systems. As described earlier, this process was initially handled by the village committee of elders, and later a lottery system was used to decide which of the four households building stoves would receive solar panels. However, the relationship created by the exchange of panels for stoves was not between the NGO and individuals, but between the NGO and the community of Jongowe. While the panels most benefited the families who lived in the homes in which they were installed, there was an expectation in the village that the power would be shared among neighbors. For example, in the evening, it was common to see neighborhood children sitting inside a house with solar power using the light for schoolwork. Similarly, it was acceptable for neighbors or family members to ask to charge their phones from a solar panel. Though the distribution of the solar panels favored some individuals over others, solar power was a shared resource that reinforced community bonds.

While the introduction of umeme was also considered "development," it was not structured in a way that required community cooperation. Individuals purchased umeme as a commodity from ZECO, and it came directly to their home without any mediation from neighbors or family. Umeme was a divisive force in that it made economic differences within the community more acute and visible. Yet, significantly, once in the home, umeme created similar social obligations as solar power. Neighbors, friends, and kin expected to have access to the electric current and to the material objects it enabled, such as irons or televisions. As someone living in a house with neither solar or umeme, I regularly visited my closest electrified neighbor to charge my phone (and covet their fan), and I was only one of many people doing so.[4] The few homes with television sets often had evening crowds. Umeme, which entered the home as a commodity purchased from the national government, became something different in the context of intra-village norms and expectations.

Appadurai (1986) emphasizes that commodities move in and out of a commodity state—that is, any "thing" can potentially be a commodity if it is in a situation where its exchangeability is a relevant social feature. While umeme is not a physical "thing" or a good like a radio or a bicycle, it has a monetary value, and is purchased with money. But, once umeme is in a home, it becomes subject to the moral economy of communal use. Electricity in the home is shared, in both the form of the current itself for charging batteries and in the form of the objects it powers. The commodity of electricity becomes reinterpreted through the social expectations of the village, and in the process reaffirms the primacy of local relationships over those created in transaction with the state.

However, while almost everyone appreciated umeme, even if they themselves could not afford it, they agreed that it was not reliable. As described earlier, the Zanzibar electrical infrastructure is plagued with problems. Being connected to the national grid is not a guarantee of power; even if the connection between Zanzibar and mainland Tanzania is secure, Tanzania is itself experiencing an energy crisis resulting in widespread and extended power outages throughout the country. Umeme is also more costly than the solar option. When it was suggested to a friend whose home had both a solar panel and umeme that he could give his solar panel to someone who did not have the connection to the grid, he admitted, "You see, that would not work because really we use the solar more. Umeme is expensive." Yet, umeme was not just costly, sporadic, and potentially dangerous; umeme came from a government that had a difficult history with Jongowe. One elder who questioned the benefit of umeme, a man who had neither solar nor umeme, told me, "Solar is better than umeme. Umeme is not reliable. You have to depend on the government." For him, reliability was not only measured by the strength and

dependability of the electrical infrastructure but also by the intentions of the state.

Residents of Jongowe are familiar with the contemporary forms of development in which projects are introduced and administered by a combination of state and non-state, national and international actors who merge in relationships of both cooperation and competition. Yet, rather than seeing these new institutional arrangements as a unified form of governance, they still carefully distinguish between different forms of authority. They acknowledge the role of the Norwegian government in assisting with the extension of the national grid to Tumbatu, but they also see the role of the Zanzibari state in continuing to provide electrical services. So, though once in the home the distinctions between solar and umeme blur, at the level of acquisition it matters to people in Jongowe that umeme comes from the government. The connection of Jongowe to the national grid has structural, historical, and social significance, and to the residents of the village, that makes it deeply personal. Electricity does more than light homes and power radios; it is a symbolic extension of the Zanzibari state into a local context. Like the plaque on the partially constructed village library claiming the building as a gift from the Revolutionary Government of Zanzibar, the electrical boxes in people's homes affirm the authority and munificence of the state in bringing modernity to the people of Jongowe. Thus, while Jongowe residents partially re-appropriate these symbols of authority and modernity by interpreting them through norms of communal exchange, they also recognize that they represent a shift in their relationship with the Zanzibari government. While umeme may be a welcome development to most, it is difficult to forget the mutual mistrust of the past, and there is ongoing uneasiness about this new relationship with the state and its potential outcomes.

CONTESTED BENEFITS

While visiting Jongowe after electrification, I commented on some of the changes I had noticed to the friend who had both a solar panel and umeme in his home. Was he worried, I asked, that umeme might aggravate the class divide in the village? He responded by explaining again how anyone who needed to use the electricity in his house could use it. He saw it as a collective good for the village, even though it was individually purchased by a few. Exasperated with my questions, he admonished, "Let those who can afford to do it do it. What other choice is there?"

His attitude was widely shared among villagers I spoke with during that stay. After greeting acquaintances, I was often asked, "So, you've returned to see umeme?" Electrification was an exciting event, an important signifier of

development for the village; even if electricity in their homes was out of reach for most residents. Whatever their concerns about the government may be, the residents of Jongowe are not going to reject electrification, and, as my friend pointed out, there is little reason to do so.

Yet, not everyone was enthusiastic about the social good it brings. The elder who was skeptical of relying on the government for umeme further explained, choosing his words carefully, "Umeme, it is necessary for these times. But, it doesn't bring any real benefits (*faida*). It doesn't put more fish in the ocean or give people more money. Yes, it brings light and TV, but these aren't real benefits."[5] While this perspective was not commonly expressed, it represents an important disagreement about the objectives of development.

For many, the items and services enabled by electricity make some progress toward bridging the perceived gap between conditions in Jongowe and other places. Indeed, some studies have shown that electrification can potentially reduce infant mortality (Gohlke et al. 2011), improve respiratory health, and increase educational opportunities, particularly for women[6] (Saghir 2005; ITDG 2005). Certainly, in Jongowe the improved lighting has made it easier to study at night, limited the inhalation of fumes from kerosene lamps, and made it possible to see dangers (spiders, scorpions, snakes) that lurk in dark corners. However, the things electricity brings do not address the significant environmental and economic challenges faced by the village. Electricity may be necessary and very desirable, but the elder's doubts are a vivid reminder that it will take more than solar panels or connection to the national electric grid to address the myriad of structural concerns contributing to Jongowe's impoverishment.

CONCLUSION

For residents in Jongowe, "development" is a complex idea. People want it, they discuss it, and they point out where it is lacking, but what exactly it means is difficult to define. As a product of development, electricity and the things it powers are desirable to many, but not everyone experiences them the same way. Further, the introduction of electricity from solar panels and the national electric grid has paradoxically both connected and divided the village. Electricity created situations for cooperation with neighbors and forged new links with the outside world, but it also signified distinctions between villagers and provoked uncertainty about the relationship between self-sufficiency and development. Once in the house, both solar and umeme were subject to communal use and redistribution, reasserting the moral authority of village norms in the face of outside interventions, yet the terms of the solar project were still controlled by the American NGO and connection to the

grid still indicated a significant extension of state power. Such contradictions between the potential for local autonomy and the opportunities for greater connection are especially important in a place like Jongowe, where pride in a distinctive heritage is coupled with tension about historic processes of political and economic marginalization.

The American solar NGO and the architects of the national electrification program were well-intentioned actors, but their "will to improve" (Li 2007) conditions on Tumbatu Island raised critical questions and had unintended and problematic consequences. While this article is critical of some of those consequences, electrification was greeted enthusiastically by most Jongowe residents for good reason. The economic divisions between villagers that are accentuated by the electrification of Jongowe are between the poor and the poorer, and electricity through solar panels or the national grid can improve the quality of life in the village. Residents of Jongowe are themselves constantly weighing the costs and benefits of development interventions, and even the skeptical favor solar power and umeme. Indeed, Jongowe would greatly benefit from having more access to the resources available through national and international development programs, but the complicated outcomes arise in part because those resources are controlled and administered by an elite few.

In Swahili, the word for globalization is *utandowazi*. Recently, Tanzanian academics have coined a new form of the word in which the second to last syllable has changed to form the Swahili word for "theft." Globalization becomes *utandowizi*, or "global theft," reflecting the disparities of global engagement. These disparities can be particularly evident in development projects, where the interests of international, national, and non-governmental actors overlap in ways that often do little to address local needs. The two electrification projects on Jongowe bring residents light, power, and opportunities for ever greater connection to national and global affairs, but they also illuminate how the terms of such connections remain decidedly unequal.

NOTES

1. With the notable exception mentioned by Myers (2005) of President Aboud Jumbe who had an underwater pipe from Unguja installed. More recently, the Zanzibari government has been involved in quelling election-related violence on Tumbatu in 2010 and mediating a protracted land dispute.
2. Pemba Island, the second largest in the archipelago and also strongly associated with the opposition party, has been similarly neglected.
3. There was at one point an unfinished "road" between the two settlements, but it is now only a path, at points barely wide enough for a bicycle.

4. The first time I asked to charge my phone, I offered to contribute a small amount toward the electric bill and was firmly rebuffed by both the family in the home and the friend accompanying me.
5. Asked about the potential for refrigerating or freezing fish, which might be useful for a fishing community, he rejected the idea because freezing fish is not good, it destroys the taste, a response that mirrors the findings of Winther (2011) on cold storage of food in Uroa.
6. These studies usually assume women will no longer cook over wood fires. Further, the benefits of electrification must be weighed against the costs of increasing electricity production, often from burning coal.

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