

TROPICAL RESOURCES

The Bulletin of the Yale Tropical Resources Institute

Volumes 32-33, 2013-2014

Owens, Tom. The Local Socio-economic Impacts of Wind Power Development in Northeastern Brazil and the Potential for Conflict or Collaboration Between Developers and Communities.



Tropical Resources Institute
Yale School of Forestry & Environmental Studies
301 Prospect St., Office 202
New Haven, CT 06511
environment.yale.edu/tri

The Local Socio-economic Impacts of Wind Power Development in Northeastern Brazil and the Potential for Conflict or Collaboration Between Developers and Communities

Tom Owens, MEM 2014

Abstract

Brazil is quickly developing a robust wind power sector while concurrently undergoing a historic drought in the northeastern regions. Drought conditions lowered water tables at hydroelectric dam sites, which Brazilians rely on for roughly 80% of their electricity demand. Wind produces peak output during the dry season when dam levels are low. Many communities that might benefit from local wind development are also among the poorest and most vulnerable. Local energy development, however, is often met with skepticism and resistance from local populations. This paper examines two case studies of wind development from Cumbe, in the State of Ceará and Alto Sertão, in the State of Bahia. Most notably, the Brazilian company Renova recently developed Alto Sertão I and II, the largest wind facilities in South America. Renova engages the local community by acquiring land leases for wind tower siting and by creating Catavento, a voluntary 4 million dollar community driven impact fund for local environmental and economic development projects such as herbal laboratories, bee keeping facilities, and a women's yucca collaborative. Renova's community engagement efforts are still in the early stages, but their company model and internal culture may be replicable in other Brazilian communities.

Introduction

In the last five years the Brazilian government has created a swell of support for wind power development by liberalizing

markets to welcome developers and manufacturers from India, China, the United States, Spain and elsewhere. New Brazilian companies such as Renova, a renewable energy company are also taking hold and pushing for local energy development. Most of this development is happening in poor northeastern states which have some of the strongest and most consistent winds globally (Rose 2011:1). Brazilian wind farm projects recently produced some of the cheapest electricity prices in markets worldwide. Prices for wind in 2011 even sold below the price of natural gas with the help of a number of gov-

Tom is a 2014 Masters of Environmental Management graduate from the Yale School of Forestry and Environmental Studies. His research focused on the potential for wind and solar power generation in Brazil. He graduated from Virginia Tech in 2006 with a BS in Biochemistry. Prior to Yale, he worked for a number of progressive organizations including Avaaz, Repower America, Chesapeake Climate Action Network and Energy Action Coalition.

ernment incentives and a recent auction system for new electricity generating projects such as gas, wind, small and large hydropower (Lacey 2011:1). The country has set goals to build more wind power than the rest of South America combined by 2023 (Martin 2014:1).

Brazil's rise in the renewable energy sector and as an emerging market has demonstrated that strong state and market goals can drive clean energy development. However, Brazil has a long history of land grabs and community displacement around energy projects, especially ethanol and hydropower development. Some local communities have questioned the development and compensation of landowners living near Brazilian wind farms (Brown 2012:3). As a result of the research I conducted in 2012, I asked: how can wind farm development in Brazil break the traditional energy paradigm that can leave local communities less informed, less involved, and disempowered in the decision making process? How can the demands of local citizens and policy makers be met while ensuring this development is truly clean and just for all parties?

Recent History of Wind Development in Brazil

The Brazilian wind development boom has not gone without its fair share of local opposition. The largest wind farm in the Brazilian state of Ceará is in the small fishing village of Cumbe. Some Cumbe residents were initially encouraged by the promise of local jobs, as well as increased local revenue for schools and health care. Others quickly grew skeptical and opposed the initial development by filing litigation and staging road blockades, one of which lasted 21 days (Brown 2012:5). According to Brown's 2009 survey, fifty local Cumbe residents

from various backgrounds actively opposed the wind project (ibid.). The remaining 50% of residents were either lukewarm or indifferent towards the development (ibid.). Many cited restricted access to their fishing areas, high dust levels, broken promises of employment and underfunded social projects as their reasons for opposition (Brown 2012:7). This level of community opposition can overwhelm a company's outreach efforts when development moves too quickly without the requisite community meetings and slow buy-in process.

Findings and Analysis: Alto Sertão

In July 2012, I visited Renova's Alto Sertão wind park in the State of Bahia during the park's inaugural month. The site became the largest in all of South America in 2012; it hosted 400 turbines and was large enough to eventually power 540,000 households (Ordóñez 2012:1). The three towns neighboring Alto Sertão are Caetitê, Guanambi and Igarorã. Located in the high desert of Central Bahia, they have roughly 150,000 residents combined. The area is home to many farmers, elderly people, and others whose income is dependent on social programs. For many, their land is their sole property (New Economy 2013:1). Many farmers live by subsistence, planting crops and surviving on as little as \$168 – \$420 USD annually (Ordóñez 2012:1). Local residents said droughts have increased in intensity and duration and the region recorded the driest January in 60 years in 2014 (Sciadone 2014:1). In speaking with one local resident in July 2012, she said they have not seen any measurable rain in a year's time. This has led to low crop yields including yucca or manioc, the primary local staple crops. Yucca yields during 2012 were dwarfed in comparison to



Photograph 1. *Learning about the yucca flour milling process.*

previous years. As droughts increase and climate change encroaches on this desert region, residents are finding it difficult to live on smaller yucca crop yields that are sold for lower market value.

I met with Renova officials in Caetité on-site and in Salvador at their corporate headquarters. Representatives boasted as much about the social development aspects of the wind farm as the energy they produced. Renova developed a voluntary four million dollar annual social investment program named Catavento, which funds local projects in the areas of socioeconomic, cultural, environmental and organizational development (Pers. Comm., 27 July 2012). The company website states, “the intention is to combine efforts and facilitate what has already been diagnosed and organized by the community itself, to materialize the actions more quickly” (Catavento Program 2012). Catavento

projects include a “Museum of Archaeology (MASB), a Festival of Performing Arts House, music and theater workshops, professional trainings, recovery and preservation of public drinking water sources, composting, a plan for developing local food and medicinal supply chains, beekeeping facilities, an herbal laboratory, shares of rural entrepreneurship and technical assistance, among others” (ibid.).

Renova representatives remarked that all Catavento programs came directly from ideas within the local community. Representatives said local residents would make demands at town meetings, which the Brazilian government requires for new energy development projects (Pers. Comm., 27 July 2012). At one town forum, a local resident spoke about his concerns over the roughly 500 native medicinal plants in the region that had yet to be categorized and might provide local mar-



Photograph 2. *Farmland with wind towers of Alto Sertão in the background.*

ket opportunities. In response to this demand, Renova hired a naturalist to work with residents to categorize and study the native plants and determine their viability for outside markets (Pers. Comm., 27 July 2012).

In a recent interview, Ney Maron, Sustainability and Communications Director at Renova Energia, said, “Over 300 families benefit from the [wind] leasing policy. We work, literally, in people’s backyards” (The New Economy 2013). He explained that once lands are actually leased, families can keep using those areas, earning new income from the rent while continuing to receive the gains they get from plantation or husbandry. By 2008, when the company first arrived in the region, annual income per capita had reached about \$1300 USD (ibid.). Two years later, some landholders with areas leased by the company had annual incomes

of more than \$3400 USD (ibid.:1). This stands in contrast to restrictions around the Cumbe wind facility. Residents there were restricted from accessing their traditional coastal fishing areas.

I met with workers at the nearby women’s yucca cooperative who were hard at work in a small room husking their crop. Although the state of Bahia had provided capital to build their facility and provide machinery, government officials stopped visiting as the initial government investment ran out. Through the cooperative, the women recognized that there were kinks in the supply chain that limited them from getting a fair value for processed yucca meal. In the government’s absence and through the Catavento program, Renova is injecting capital to allow the women to reach more stable markets and receive just compensation.

I also met with a number of local landowners, all chosen by Renova's staff for short interviews. Renova built new houses for several families since their old ones were too close to the wind towers. These families were very receptive to my visit and showed me through their house room by room. Many appeared very proud of their new homes and spoke of the financial opportunities of receiving \$2350 USD annually for each tower on their property. One local landowner is paying for one of his eight children to attend medical school in Salvador through the fund (Ordóñez 2012:1). Another elderly woman I spoke with remarked that her son was initially skeptical of the company's intentions and refused to lease his property. Instead the company changed their siting plans and placed more towers on her property.

In speaking with one of Renova's staff

sociologists, he reminded me of the challenges of building support amongst landowners, especially given the size of the wind farm. He seemed to serve as an internal advocate, reminding the company that development "done right" takes due time and proper input from local communities. When asked if other wind development companies have sociologists on staff who understand local dynamics, he shook his head with disappointment. He knew his position with Renova was rare in a country fraught with land disputes. However, he said that collaborative local energy development was challenging given financial and construction deadlines. Brazilian energy contracts require that power producing stations come online by a given deadline or face penalties. In this case, it was contracted to deliver power as of July 1, 2012 (Pers. Comm., 30 July 2012).



Photograph 3. Family in their new house courtesy of Renova.

There is often friction and tension when a development as large as Alto Sertão moves into a new region. There are currently five wind companies developing in the local region, all with varying community outreach strategies (Renova Energy, Iberdrola, Polimix, Atlantic, and EPP). Contract research by Gilmar Ferreira dos Santos counters the claim that Renova is a transparent and just corporate citizen (Ferreira dos Santos 2012). He claims that the local residents are largely unaware of the provisions in their leasing contract and are prohibited from seeking independent third party counsel (*ibid.*). The seventh clause of Renova's landowner contracts states that if you wish to rescind, you will be subject to a fine of roughly one million USD and be forced to pay for the cost of each tower on your land. Turbines are also located in common use zones, which he fears could limit future cattle grazing and farming near the turbines. In the village of Brejo dos Padres in the municipality of Morrinhos Guanambi, residents claim that Renova destroyed an archeological site during construction and withdrew excess water resources in the drought region (*ibid.*:1). The shortage of water resources will continue to be one of the greatest challenges to the region.

Conclusion

There are many illuminating lessons and questions from Renova's development in the Alto Sertão region. Sustainable energy development must be led with community interests at the core. Transparent processes and public forums help residents have a voice in the process. Brazilian state laws mandate that public forums be held to address development concerns and that owners on wind tower properties be duly compensated if their land is legally titled. However, as evidenced

by the Cumbe case, local concerns can be easily glossed over when development is on the fast track. The Catavento program, despite the relatively small size of the impact fund, is an experiment in bridging local voices together with developers through the prospect of enhanced economic opportunities. This program is kept in check by local "born and bred" development teams who work directly with residents and trained social scientists that help develop collaborative processes. This helps deliver the concerns of community members to the internal company decision-making process. It is doubtful, however, that all of these concerns can be addressed in the face of tight project development deadlines.

Finally, the Catavento program is intended to fund social and economic programs through several rounds over the lifetime of the wind farm. Residents can rely on the prospect of several rounds of Catavento funding as they face the financial challenges of growing a business, building supply chains, and attracting visitors to the region. However, Brazil is going through several years of weak financial performance and is struggling to attract foreign investment for capital-intensive energy projects. In the future, it may be difficult for a growing company such as Renova to develop timelines that allow for maximum community input and set aside capital for local projects.

This research relied heavily on the voices of Renova and chosen community members from their ally groups and in no way encompasses the voices of those affected by Alto Sertão. More research that engages other key stakeholders might better encapsulate the challenges and opportunities found here. Regardless, Renova's receptivity to local demands and its collaborative funding process bring some hope to the area. The community will need more than just clean energy to

combat increased droughts and unstable crop yields in the future.

Acknowledgements

Thanks to my advisor Gordon Geballe and the financial and advisory support of Tropical Resources Institute, Coca Cola World Fund, and Carpenter-Sperry. The interviews would not have been possible without the connections made by Renova Energia and ABEEólica.

References

- Brown, Keith Brower. "Wind Farms on "Our Copacabana": The Wind Industry Experiment in Northeastern Brazil." *Carbon Trade Watch*. May 2012. Web. Accessed 23 Feb. 2014. <<http://www.carbontradewatch.org/downloads/publications/BrazilWindFarm.pdf>>
- "Catavento Program." *Renova Energia*. July 2012. Web. Accessed 23 Feb. 2014. <<http://www.renovaenergia.com.br/pt-br/comunidades/catavento/>>
- Orodonez, Ramona. "Na Bahia, famílias vivem de vento." *O Globo Newspaper*. 07 July 2012. Web. Accessed 23 Feb. 2014. <<http://oglobo.globo.com/economia/nabahia-familias-vivem-de-vento-5420145>>
- Lacey, Stephen. "In Brazil, Wind is cheaper than natural gas." *Climate Progress*. 23 Aug. 2011. Web. Accessed Feb 23 2014. <<http://thinkprogress.org/climate/2011/08/23/302008/in-brazil-auction-wind-power-is-cheaper-than-natural-gas/>>
- Rose, Chris. "Wind power in Brazil set for rapid expansion within next three years." *European Wind Energy Association Blog*. 29 Sept. 2011. Web. Accessed 23 Feb. 2014. <<http://www.ewea.org/blog/2011/09/wind-power-in-brazil-set-for-truly-rapid-expansion/>>
- Sciaudone, Christina. *Bloomberg Business Week*. "Drought Drains Power as Wind Farms Sit Unused: Corporate Brazil." 05 Feb. 2014. Web. Accessed 23 Feb. 2014. <<http://www.businessweek.com/news/2014-02-05/drought-drains-power-as-wind-farms-sit-unused-corporate-brazil>>.
- New Economy. "Renova Energia's renewable energy vision for Brazil." *The New Economy*. 10 Dec. 2013. Web. Accessed 23 Feb. 2014. <<http://www.theneweconomy.com/energy/renova-energia-renewable-energy-brazil>>
- Martin, Richard. "Brazil Will Have More Wind Power Capacity Installed by 2022 Than All Other Latin American Nations Combined, Forecasts Navigant Research." 19 Feb. 2014. Web. Accessed 23 Feb 2014. <<http://finance.yahoo.com/news/brazil-more-wind-power-capacity-203400766.html>>
- Ferreira dos Santos, Gilmar. "Energia Eólica: Uma análise acerca dos impactos sociais e ambientais em Caetité, BA." *EcoDebate Portal*. 05 Oct. 2012. Web. Accessed 23 Mar. 2014. <<http://www.portaldomar.org.br/blog/portaldomar-blog/categoria/noticias/energia-eolica-uma-analise-acerca-dos-impactos-sociais-e-ambientais-em-caetite-ba>>