

4 Interaction between wind energy, climate vulnerability, and violent conflict in Northern Kenya

*Janpeter Schilling and Luise Werland*

S. 67–81

aus:

# **Climate Change, Security Risks, and Violent Conflicts**

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in Hamburg

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# 4 Interaction between wind energy, climate vulnerability, and violent conflict in Northern Kenya

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*Janpeter Schilling and Luise Werland*

## Abstract

*Wind energy is a key technology in efforts to decarbonize the global energy system. Generally, the exploitation of wind resources is seen as a silver bullet in the fight against climate change. Negative effects and conflict implications of wind energy projects are often dismissed as negligible. The paper aims at challenging this belief by analyzing the implications of wind energy for local communities in northern Kenya. Specifically, the paper explores how the recently completed wind park in Marsabit County affects the vulnerability of the local population to climate change and how the project influences existing and new conflict dynamics. The paper first reviews the state of knowledge on renewable energy projects in developing countries and particularly on the African continent. Second, the main results of the field research conducted between 2016 and 2018 are presented and discussed in order to draw conclusions and give policy recommendations in the final part of the paper.*

**KEYWORDS:** *Wind, energy, renewables, conflict, climate change, vulnerability, Kenya.*

## Introduction

Global climate change is one of the key challenges humanity is facing in the 21st century. To effectively mitigate climate change, it is important to significantly increase the global share of renewable energy production. Particularly wind energy plays an important role (REN21 2017). In 2016 renewable energies had an installed capacity of 921 gigawatt (GW) while wind energy accounted for more than half of it (REN21 2017). Projections suggest that the currently installed capacity of 487 GW will increase to 817 GW by 2021 (GWEC 2017). Until now, most wind parks have been built in middle- or high-income countries like China, USA, and Germany (REN21 2017). However, in the future it is expected that the installation of wind energy will grow faster in developing countries (GWEC 2017; Wiser et al. 2011).

While there is little doubt about the importance of wind energy in transitioning to a global low-carbon energy system, the local effects of wind parks on communities in developing countries are hardly studied. The present paper addresses this research gap by asking the following research question: How do wind parks impact local communities in northern Kenya? More specifically, we ask: How does the recently completed Lake Turkana Wind Park affect the vulnerability of the local population to climate change and how does the park influence existing and new conflict dynamics? The wind park is the largest wind power project on the African continent (ADB 2017). It was completed in June 2017 and consists of 365 wind turbines with a total capacity of 310 Megawatt (MW) (LTWP 2017c). The Lake Turkana Wind Power (LTWP) project is the “single largest private investment in Kenya’s history” (Kenyan Wall Street 2017). The wind park is the second major source of renewable power after hydropower (CIA 2018). The people living in the proximity of the wind park are mostly Turkana. Other groups in the region include Samburu and Rendille. The area has a history of violent conflicts, fought between the three groups over livestock, water, and land (e. g. Pike et al. 2010). The county of Marsabit, where the wind park is located, is among the most marginalized ones in Kenya in terms of income per capita, education and health, and road infrastructure (GoK 2014; UNDP 2006). Northern Kenya is characterized by a semi-arid climate that is expected to get warmer and receive more unreliable rainfall as a result of global climate change (Schilling et al. 2014).

This paper is structured as follows: The next section provides a review of the literature on wind parks with an emphasis on key benefits, externalities, and conflict implications for local communities. Section 3 then gives a brief overview of the methods and concepts used to generate the results of the Kenya case study presented in Section 4. The final section concludes the paper with reflections on implications for the broader debate, future research, and actor-specific recommendations.



## Local Benefits, externalities and conflict implications of wind parks

The majority of the installed wind power capacity is currently located in developed countries in Europe, Asia and North Africa while emerging countries like China, Brazil and South Africa have high potential and growth rates (REN21 2019). Hence most of the literature focuses on the local implications of wind parks in these regions and countries. So far, there are hardly any studies available that are carried out in developing countries where the exploitation of wind energy is a fairly new phenomenon (Schilling et al. 2018). However, it is possible to draw on studies from developed and emerging countries to anticipate what the effects in developing countries may be.

Wind parks can create new jobs and other sources of income and development (Aitken et al. 2008; Ellis et al. 2007; Gamboa and Munda 2007; Hirsh and Sovacool 2013; Karydis 2013; Rand and Hoen 2017). Further, wind parks can become a possibility for public participation (Becker et al. 2016; Karydis 2013; Rand and Hoen 2017). Wind energy can contribute to the development of decentralized electricity production systems (Gamboa and Munda 2007). Because of the fairly short time needed to build wind parks, a growing local demand can be met quicker than with conventional energy sources and with a lower economic risk (Hirsh and Sovacool 2013).

Despite these benefits, opponents reject wind parks because of their local externalities. Particularly in developed countries, studies find the impact on the landscape and environment to be the main reason for opposition to wind parks (Ellis et al. 2007; Hirsh and Sovacool 2013; Karydis 2013; Rand and Hoen 2017; Weber et al. 2017; Wolsink 2007). These concerns include negative impacts on the biodiversity, hydrology, and geology (Aitken et al. 2008; Becker et al. 2016; Hamilton et al. 2018; Karydis 2013; Weber et al. 2017). Concerns about impacts on wildlife such as birds and bats are often raised (Aitken et al. 2008; Hamilton et al. 2018; Petrova 2013; Reusswig et al. 2016).

Local stakeholders may oppose wind parks because of their visual and aesthetic impact on the landscape and a perceived reduction of the quality of life (e. g. Rand and Hoen 2017; Schwenkenbecher 2017). Sometimes, communities fear a loss of cultural landscape and national heritage (e. g. Reusswig et al. 2016). Others consider wind parks to be intruders into their familiar surroundings and assume their local identity is threatened (e. g. Wolsink 2007). Some studies point to the negative impact on tourism (e. g. Gamboa and Munda 2007; Karydis 2013). Others indicate concerns about noise (e. g. Saidur et al. 2011) and health risks (Petrova 2013; Reusswig et al. 2016). Ultrasound and low frequency sound are caused by the rotor blades (e. g. Ellis et al. 2007; Schwenkenbecher 2017) and this noise can lead to the development of Vibro-Acoustic-Disease (Karydis 2013). Further emissions consist of shadow flicker, which may produce psychological stress (Hirsh and Sovacool 2013; Karydis 2013). There can be an impact on human health from electromagnetic fields (Karydis 2013).

Some authors have argued that the postulated economic benefit may actually be rather poor, for example because the created jobs are just temporary (Karydis 2013; Rand and Hoen 2017). Electricity prices can increase, affecting everyone connected to the grid (Schwenkenbecher 2017).

Wind parks can cause conflict and undermine the social contract, for example, when local community members perceive the siting process as unfair or feel that they were unable to participate in and influence the overall process (e. g. Ellis et al. 2007; Froese and Schilling 2019; Rand and Hoen 2017). Particularly if concerns are ignored or being perceived as being ignored, the likelihood for local opposition to wind parks grows (Petrova 2016; Reusswig et al. 2016; Wolsink 2007). Misinformation (Ellis et al. 2007; Karydis 2013) and lack of distributive justice can cause conflict as well (Rand and Hoen 2017; Reusswig et al. 2016; Zografos and Martinez-Alier 2009). Insufficient or unfair distribution of compensation of landowners and other local stakeholders can cause intra- and inter-community conflict (Rand and Hoen 2017).

## Methods

This study is based on qualitative field research conducted in February and March 2017, and in March 2018. In total 81 people were interviewed in individual and small group interviews. These interviewees were mostly community members. Representatives of the wind park and different levels of government were interviewed as well. The research was carried out in Marsabit County, Kenya, and specifically in the town Loiyangalani, the fishing village Komote at Lake Turkana, and the village of Sarima, which had been relocated in 2015 by about two kilometers because of the wind power project (see Fig. 1).

There is no official number of the population of Sarima. One participant of a small group discussion in Sarima suggested a population of 2000. However, based on observations of the research team this seems to be a rather high estimate. Approximately 1000 people appears to be a more realistic estimate. This estimate is broadly in line with the figure of 1180 given in the Resettlement Action Plan (cited in Danwatch 2016).

Vulnerability is the key guiding concept of this article. The latest definition of the IPCC is used, which describes (climate change) vulnerability as “the propensity or predisposition to be adversely affected [by climate change]” (IPCC 2014:1775). According to the IPCC, vulnerability is a function of sensitivity and adaptive capacity (IPCC 2014). We suggest to defining sensitivity as the availability and importance of the affected resource and adaptive capacity as the knowledge and financial and technical means to adapt to climate change (see IPCC 2014; Schilling et al. 2012a). Hence income opportunities and a formal job in particular strengthen the adaptive capacity.

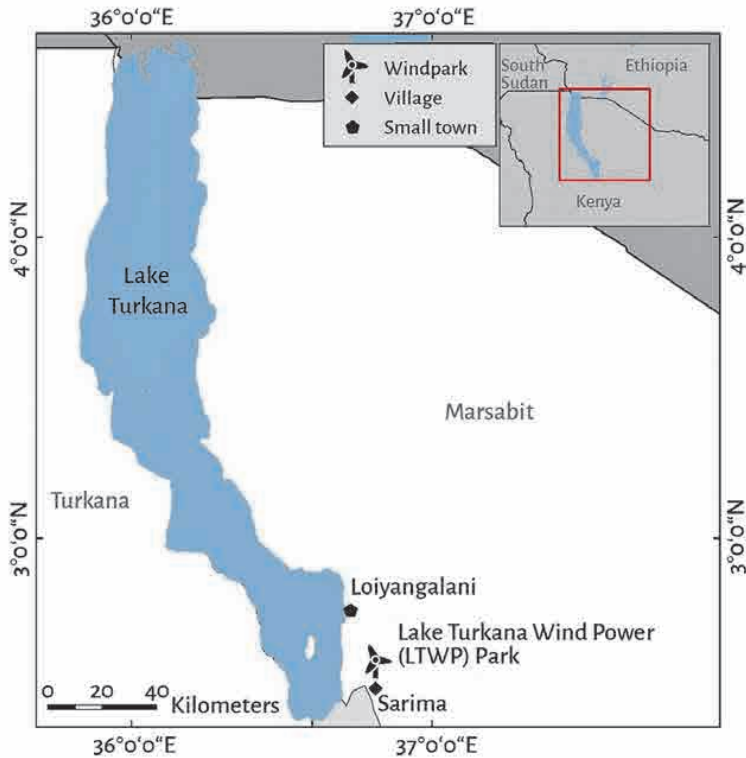


Figure 1: Location of Lake Turkana Wind Park in northern Kenya. Source: Zulfiqar Ali Shah for the authors.

We understand conflict as a situation, in which at least two actors consider their goals to be incompatible with each other. In a violent conflict, at least one actor is using force to achieve an aim or to directly damage the other conflict party (Scheffran et al. 2012).

## Results

Similar to the literature review (Section 2), this section first describes the local benefits, externalities and conflict implications of the wind park before the results are interpreted with respect to their impacts on the climate change vulnerability of the local communities.

## Local benefits

### *Employment*

The extent of employment varies greatly across the project phases. According to the website of the Lake Turkana consortium, 2500 people were employed in the project during the construction phase between October 2014 and March 2017. Three quarters of the workers came from Laisamis Constituency, to which Loiyangalani belongs. After installation of all turbines in March 2017, the number of people employed declined to 911 people, “of whom 81 % were local”. However, it is not further specified what “local” refers to exactly. During the operation phase, 250 people are expected to be employed, with three quarters being “locals” (LTWP 2017b). These official numbers are hard to verify on the ground but the sharp decline in employment was reflected in the interviews. According to the Deputy County Commissioner of Loiyangalani, around 1000 people have been employed in the project, “mostly people from around here”. He further explained that “right now [March 2017] there is less employment but initially there were a lot of people employed”. The assistant chief of Loiyangalani adds that particularly the youth was employed during the construction phase<sup>2</sup>. A woman in a small group interview in the relocated village of Sarima gave the following statement: “When the project started, it employed many people, but now [March 2017] the number reduced and we were told the remaining jobs were for the skilled. We can’t blame them [the ones in charge of the project] for that because none of our children are trained or skilled”<sup>3</sup>. During the time of our research, the construction of the turbines was almost completed and only one man out of the 19 people interviewed in Sarima was still working at the wind park. He was employed as a security guard. Other jobs community members of Sarima and others in the surrounding area of the wind park occupied during the construction phase of the project included cooking and cleaning in the LTWP camp, digging holes and mixing cement for the fundamentals of the towers, clearing the way for roads, and rarely technical work. According to several members of the Sarima community, a casual laborer received 520 KES (4.9 USD) per day. Based on a small group interview with women, the income was mostly spent on school fees and food for the family<sup>4</sup>.

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<sup>1</sup> Interview with J. Kihora, Deputy County Commissioner Loiyangalani, Loiyangalani, 28 February 2017.

<sup>2</sup> Interview with P. Lesas, Assistant Chief Loiyangalani, Loiyangalani, 28 February 2017.

<sup>3</sup> Interview with Group of Women, Pastoralists, Sarima, 28 February 2017.

<sup>4</sup> Interview with Group of Women, Pastoralists, Sarima, 28 February 2017.

### *Road infrastructure*

In Marsabit, the road infrastructure improved because of the wind project. According to the Deputy Subcounty Administrator of Loiyangalani, Paul Machan, the new roads promote the mobility of people in Loiyangalani. However, he also stressed that it was unfortunate that LTWP paved the road connecting Sarima with Laisamis rather than improving the road between the county capital Marsabit and Sarima, a route LTWP initially used. However, even the road to Laisamis improved the accessibility of Loiyangalani leading to a strong influx of people, particularly when the demand for laborers was high during the construction phase.

### *Water*

In addition to employment, water was the second key issue for communities in Marsabit. For Sarima, a borehole was drilled that allowed the community to access groundwater. “The white man [referring to Nick Taylor, a LTWP manager] from the project came and gave us water” states a woman from Sarima<sup>5</sup>. The appreciation by the community members in Sarima for the borehole was obvious, particularly because of the severe drought that affected the area at the time of the research. Observations by the research team confirmed that the borehole was functioning and being used by the community in Sarima. However, the desalination unit was not functioning during our second research visit in March 2018.

### *Electricity*

Some community members in Sarima stated that they were promised to be connected to the wind park and the electricity grid. However, at the time of the research, no other indication for such plans was found. The energy generated in Marsabit is fed into the national grid and subsequently sold to the customers (Star 2017). LTWP rejects its supposed responsibility to provide the local communities with energy (LTWP 2017a). Instead, LTWP stresses that this is the responsibility of the Kenya Power and Lighting Company and the Rural Electrification Authority. “LTWP only has a license to generate power not for distribution” (LTWP 2017a). The 428 km-long power line between the wind park and the substation in Suswa has faced several delays. The power line was finally completed in September 2018 (LTWP 2018).

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<sup>5</sup> Interview with Group of Women, Pastoralists, Sarima, 28 February 2017.

## Local externalities

### *Loss of income*

A key challenge for communities in the region of the wind park is the highly fluctuating need for casual labor resulting in sudden losses of employment and household income. During the height of the construction phase, community members from Sarima and Loiyangalani got used to the regular income from the wind project. When casual laborers were laid off, community members and government representatives described it as a “shock”. One woman from Sarima explains that “it has really affected us, [...] those who were employed are now sacked, the life is hard for them because this was like a family income”<sup>6</sup>. The loss of income often came at times when community members were losing large numbers of livestock due to drought as well.

### *Relocation*

For community members in Sarima, the second key externality of the wind project was that they had to be relocated. While only a few interviewed community members complained about the small amount they received as compensation for having to relocate, the fear of having to relocate again was widespread. “We hear that the wind power [project] could want to move us again”, a man from Sarima recounts in a small group interview<sup>7</sup>. The research team followed up on those rumors but could not confirm or falsify them. When asked about further relocation plans, the Deputy Sub-county Administrator of Loiyangalani only said that “there will be need for new roads to pass”<sup>8</sup>.

### *Loss of land and water resources*

Loss of access to land and lack of financial compensation for local communities was among the key concerns in Marsabit. Several community members in Sarima and Loiyangalani complained that LTWP received a lease for 40 000 acres but “they [LTWP] have taken more than 110 000 acres”<sup>9</sup>. A lawsuit by local actors against the size of the project and how the land was acquired, resulted in a ruling by the High Court in Meru in November 2016, which allowed the project to continue but confined it to 87 500 acres (Daily Nation 2016). While members of the Sarima community did not seem to have received any financial compensation for the land given to the wind project, the turbines are not fenced and the area surrounding them was still accessible to the community members at the time of research.

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<sup>6</sup> Interview with Group of Women, Pastoralists, Sarima, 28 February 2017.

<sup>7</sup> Interview with Group of Elders and Youth, Pastoralists, Sarima, 28 February 2017.

<sup>8</sup> Interview with P. Machan, Deputy Sub-County Administrator, Loiyangalani, 1 March 2017.

<sup>9</sup> Interview with Group of Elders, Diverse backgrounds, Kiwanja, 1 March 2017.

*Environmental pollution*

At the time of the last research phase in March 2018, the rotors were not moving but the rotors had changed the appearance of the landscape. Once the rotors start turning, (limited) pollution can be expected in terms of noise emissions, flicker, and light reflections. Further, accidental killings of birds by rotors are likely as previous studies suggest (Voigt et al. 2015). The interviewed community members in Sarima knew little about the environmental effects of the turning turbines but some raised concerns. These “turbines we see, could kill our animals”, stated one woman in Sarima<sup>10</sup>.

*Local conflict implications*

In Sarima, a few community members and the Assistant Chief of Loiyangalani reported that a couple of times access roads to the wind farm had been blocked by community members, for instance near Sarima and South Horr. The Deputy County of Loiyangalani mentioned that roadblocks were frequent around May 2016. Several women from Sarima reported that “the road [leading to the wind park] was closed even yesterday and today”<sup>11</sup>. These roadblocks are generally set up by young men. The key driver of these community roadblocks was unmet community demands for employment in the wind project. To a lesser degree, unmet demands for water play a role and the Deputy County Commissioner of Loiyangalani added community frustration over “payment of little amounts of money” by the wind project as another reason. According to one woman in Sarima, a roadblock in February 2017 led to the employment of three Turkanas and four Samburus in the wind project<sup>12</sup>. The Deputy County Commissioner of Loiyangalani explains “people from Samburu say the land is theirs, the Samburu, the Rendille all of them say the land is theirs”<sup>13</sup>. A member of the Sarima community made this observation: “they [the Samburu] saw this project has come, they saw the Turkana will benefit from it, let us chase them and go to their land”<sup>14</sup>. Employment opportunities were named as a source of inter- and intra-communal disputes. “These people [from LTWP] don’t employ us, they only employ the Samburu” states a community member in Sarima. Many interviewees in Sarima were particularly angry when jobs as security officers were given to Samburus<sup>15</sup>. The “heads of G4S [the security company] are all Samburus”, complains one member of a small group interview in

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<sup>10</sup> Interview with Group of Women, Pastoralists, Sarima, 28 February 2017.

<sup>11</sup> Interview with J. Kihora, Deputy County Commissioner Loiyangalani, Loiyangalani, 28 February 2017.

<sup>12</sup> Interview with J. Kihora, Deputy County Commissioner Loiyangalani, Loiyangalani, 28 February 2017.

<sup>13</sup> Interview with J. Kihora, Deputy County Commissioner Loiyangalani, Loiyangalani, 28 February 2017.

<sup>14</sup> Interview with Group of Elders and Youth, Pastoralists, Sarima, 28 February 2017.

<sup>15</sup> Interview with Group of Women, Pastoralists, Sarima, 28 February 2017.

Sarima<sup>16</sup>. “We have our own Security to handle conflict”, declares the Managing Director of the wind project to further explain that “we also employ KPR”. KPR are members of the Kenya Police Reserve who are people in charge of protecting the communities. This means that the wind project is using security personnel that is meant to protect communities rather than a private project. “The police even comes to us for information because we know more than the police”<sup>17</sup>.

### Implications for the vulnerability of local communities

Figure 2 summarizes the key implications of the wind park for the climate change vulnerability of the local communities, specifically the village of Sarima. The employment opportunities offered by the wind project generally increase the adaptive capacity of community members in Sarima as income means that people can buy food during times of drought and are more likely to send children to secondary schools. However, the income effect was mostly limited to the construction phase of the project, which is now completed. Currently, only few income opportunities exist in form of security guards and casual laborers (cooks, cleaners, etc.) working in the LTWP camp. The accessibility of goods has improved for Sarima as a regular bus service between Marsabit, Sarima, and Loiyangalani has been set up. This has further created business opportunities. Hence, it increased the adaptive capacity and reduced the vulnerability of Sarima. The borehole drilled by LTWP has improved the water accessibility of community members in Sarima at least for livestock, which are less sensitive to the salinity of the water than humans. Therefore, the wind project has generally reduced the climate sensitivity of Sarima.

In contrast, a loss of land would increase the sensitivity of Sarima. However, the actual area inaccessible for the communities is the LTWP camp itself. Access to it is restricted to people working in the camp. The externalities are hard to evaluate at this point as the power line has not been completed at the time of the field research and therefore the negative effects described in section 2 (flicker, ultrasound, etc.) have not (yet) occurred. Given the close proximity of many of the 365 turbines to Sarima, the turning turbines will likely add stress to the community members of Sarima and potentially also the community’s livestock. To our knowledge, there are

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<sup>16</sup> Interview with Group of Women, Pastoralists, Sarima, 28 February 2017.

<sup>17</sup> Interview with Phylip Leferink, LTWP Main Station, near Sarima, 7 March 2018.



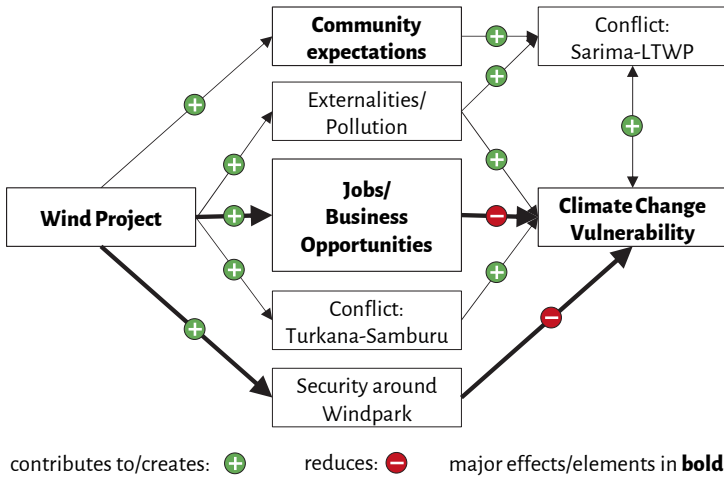


Figure 2: Implications of the wind project on local climate change vulnerability

no studies available analyzing the effects of wind turbines of the type of sheep, goats, and cattle kept by the community of Sarima. However, negative effects on animal health and meat production have been documented for geese and pigs (Karwowska 2015; Mikolajczak et al. 2013).

The violent conflicts between Sarima and groups of Samburu and to a lesser degree Rendille are a key driver of vulnerability as they undermine the adaptive capacity and lead to inefficient use of resources (see Schilling et al. 2012b). In that sense, the wind project has reduced the greatest challenge to adaptive capacity, namely the security situation. Both community members of Sarima and the manager of the LTWP camp stated that attacks and raids on Sarima have become less frequent. While this certainly is a positive aspect, LTWP has taken over a key role of the government: the provision of security. This is a critical issue as community members no longer rely on the state to provide security but rather on a private company.

## Conclusions

The aim of this paper was to analyze the implications of wind energy for local communities in northern Kenya, particularly with respect to the communities' vulnerability to climate change and conflict dynamics. Several positive local effects that the

literature on wind parks in developed and emerging countries have identified, can also be found in Kenya. For instance, there can be little doubt about the fact that the project has brought development to the community of Sarima. The road, a borehole and temporary employment opportunities have improved the adaptive capacity and reduced the sensitivity and vulnerability of the community to climate change. Furthermore, the security situation has improved for Sarima as more security forces are present in and around the wind park. However, the notion of wind energy as a silver bullet in the fight against climate change needs to be challenged. The employment effect is temporary and it has the potential to aggravate existing conflict lines. Additionally, a company has taken over the role of the government in providing security. The wind company has absorbed community security forces to protect the wind park while these forces are likely to be missing elsewhere. This impact on the security dynamics is similar to what Schilling et al. (2015) have found in the case of oil exploration in northern Kenya (see also Schilling et al. 2018). Land is another issue that has led to a court case, in which community members claim that insufficient compensation has been paid to the community.

A few conclusions can be drawn from this study for key actors and further research. For companies operating in conflict-affected and underdeveloped areas such as northern Kenya, it is advisable to carefully consider its distribution of resources (jobs, infrastructure, financial incentives, etc.) within the communities as this has an impact on inter-communal relations and how the communities perceive the operating company. For the government, it is important avoid letting a private company taking over government responsibilities in terms of providing security, infrastructure, and development to the communities. It is further important to connect the communities and local towns to the wind park. Otherwise, Kenya increases its production of renewable energy while the communities around the wind park only face the externalities of the project (such as the flickering effect) and “sit in the dark”. Communities need non-violent channels and mechanisms of communicating their expectations and discontent to the wind park operators.

For researchers it is promising to continue the research on the wind park in northern Kenya to explore how the perception of the community in Sarima has changed and how the conflicts have developed, now that the wind park is in operation and the rotors are turning. More generally, the question remains why communities oppose or welcome wind parks in developing countries. Particular attention should be paid to the employment and security effects.

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