



Twenty-five years under the wind turbines in La Venta, Mexico: social difference, land control and agrarian change

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ABSTRACT



As wind energy investments expand across rural areas, unique class dynamics and accumulation patterns result from this industry. The *ejido* La Venta town has hosted wind farms since 1994, allowing us to analyse the effects of wind power on patterns of social difference, land control and agrarian change. By drawing on agricultural censuses and on 40 interviews with landowners, this paper argues that wind energy investments shift patterns of land control, through fostering land-based incomes, over the long term. The result is enhanced social differentiation benefitting landowners with more than 20 hectares and pauperising those with small tracts of land.

KEYWORDS

Wind energy; social differentiation; land control; land use; Isthmus of Tehuantepec

Introduction

Owing to the way wind energy farms operate, agricultural production activity can coexist with the harvesting of wind, as the infrastructure only occupies between five to seven per cent of the leased area. Although scholarship has analysed the relationship between extractive industries, poverty and livelihood change (Bury 2004, 2005; Bury and Kolff 2002; Gamu, Le Billon, and Spiegel 2015), papers investigating the intersection between long-term agrarian change and renewable energy expansion are still scarce (Dunlap 2017b; Franquesa 2018; Stock and Birkenholtz 2019). In the Isthmus of Tehuantepec, scholars have analysed the local impacts resulting from wind investment since the installation of the La Venta I wind farm, such as asymmetric information, violence, and employment throughout the construction and operation phases (see Avila-Calero 2017; Boyer 2019; Dunlap 2019; Howe 2019; Huesca-Pérez, Sheinbaum-Pardo, and Köppel 2016, 2018; Juárez-Hernández and León 2014; Lucio López 2016; Rueda 2011; Zárate-Toledo, Patiño, and Fraga 2019). This body of research, although important for improving our understanding of the impact of renewable energies, is lacking in long-term studies (see Franquesa 2019) that shed light on the differentiated trajectories of agrarian change faced by those who lease their land to wind companies in the *ejido* system. This paper seeks to contribute to this gap and to other accounts that engage with landowners' experiences in the region (Avila-Calero 2017; Dunlap 2019; Howe 2019; Ramirez 2019) by focusing on the particular case of La Venta, allowing a more in-

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depth analysis of the consequences of wind investment for class dynamics and different patterns of accumulation among landholder subgroups over the last 25 years. In 1994, La Venta became the first *ejido*¹ in Latin America to have a wind farm installed. Wind energy investment in the *ejido* has been so significant that, by 2020, they have extended to over 50 per cent of the land, occupying 3,221.8 hectares (Nahmad, Nahón, and Langlé 2014, 3). Drawing on agricultural censuses on the *ejido*, discontinuous fieldwork in the region from 2017 to 2019, and 40 semi-structured oral history interviews² focused on wind energy expansion and land use dynamics with current and former land authorities, activists and *ejidatarios*,³ this paper argues that wind investment has accelerated patterns of social differentiation⁴ among landowner subgroups, thereby exacerbating pre-existing land inequalities. Wind energy, therefore, results in different material and social relationships between landowners and wind energy, with actors benefiting – or not – according to pre-existing patterns of social difference.

This paper is structured as follows. The first part analyses how original land allocations have changed owing to land concentration and a slow shift from arable farming to cattle grazing. The second part investigates social differentiation patterns arising between four landholder groups: those with more than 20 hectares, those with less than 20, those who have sold their land and those whose land was not considered for the wind energy project. The paper concludes with a reflection on renewable energy and agrarian change.

Wind power expansion, ‘green grabbing’ and social differentiation

Owing to its low energy density, wind power expansion requires large areas of land, and its development will compete with or displace many existing and alternative land uses, including food production (Calvert 2015; Huber and McCarthy 2017; Naumann and Rudolph 2020; Smil 2006). In the Mexican *ejido*, ‘green grabbing’ is rooted in agrarian history and land transactions, no less significant or violent, are regulated by the Agrarian Law⁵ (see Rocheleau 2015; Soto Baquero and Gómez 2012). This means that, for instance, no *ejidatario* can own more than five per cent of the *ejido* land, and that *ejidatarios* can only select one person to inherit their land (DOF 2018). In La Venta and neighbouring towns, land for wind power expansion has been secured through intermediaries promoting unrealised production projects, the creation of multiple manipulative projects through third enterprises and the disbandment of dissent through a workers’ union (see Torres Contreras 2018; Dunlap 2018; Nahmad, Nahón, and Langlé 2014). The appropriation of land for environmental purposes transforms livelihoods (Fairhead, Leach, and

¹*Ejido* is land distributed among communities after the Mexican Revolution of 1910. Initially, *ejido* members could use and work the land, but could not use it as collateral nor sell it. A reform passed in 1992, known as Programme of Certification of Ejidal Rights and Land Titling (PROCEDE), enabled *ejidatarios* to lease or sell their plots if the majority of the members of their *ejido* agreed (Payan and Correa-Cabrera 2014, 2).

²Random numbers from 1 to 40 have been assigned to the interviews with *ejidatarios*.

³Member of an *ejido*.

⁴Social differentiation refers to the emerging differences between the upper and lower segments of a given rural society, based mainly on control of land and interacting with elements such as gender, class and ethnicity (see Ploeg 2018; White 1989, 2018; for Mexico see Bartra and Otero 1987).

⁵*Ejido* La Venta has not yet adopted the *Dominio Pleno* scheme, meaning that land transactions in the *ejido* are regulated by the Agrarian Law and can only take place among *ejidatarios*.

Scoones 2012), and brings about social change (Dunlap 2019) as well as ecological distribution conflicts (Zografos and Martinez-Alier 2009), as has been shown in the case of solar energy (Rignall 2015; Stock and Birkenholtz 2019) and biofuels (Baka 2016; Borrás, McMichael, and Scoones 2010). It is important to explore which groups are affected in the long term because of wind power expansion, and in what ways.

Wind energy development provokes the reproduction as well as the restructuring of local patterns of accumulation and the social relations of production within and across local spaces. While the process of social differentiation brought about by these kinds of investments has been associated with two separate and contradictory patterns – internal differentiation and proletarianisation (Raikes 1978, 286) – these are actually interlinked and result in hybrid class categories such as semi-peasantry or worker-peasants (Bernstein 2010). Because wind energy infrastructure allows for production activities to continue, the processes of differentiation resulting from this industry must be analysed through a double dynamic: dynamics affecting those who traditionally sell their labour and the differences experienced by those who own the land.

While the agrarian question concerning those who sell their labour as a consequence of renewable energy expansion has been explored by a handful of scholars (Torres Contreras 2018; Dunlap 2017b; Stock and Birkenholtz 2019), the uneven outcomes amongst those who lease the land to wind enterprises have received little attention (Avila-Calero 2017; Copena and Simón 2018; Dunlap 2017b; Howe 2019; Nahmad, Nahón, and Langlé 2014). As new livelihoods are established, investments initiated and production begins alongside business opportunities, differentiation also commences and ultimately unfolds to reveal the winners and losers associated with wind power expansion. It does so by enhancing the position of the agrarian classes while fostering different accumulation processes and political, economic and social relations.

In La Venta these processes of social difference can be traced back to original land allocations within the *ejido* that have been altered among various subgroups of landowners interacting with forces such as class, gender and ethnicity. When a landholder decides to lease their land, most of the time through deceitful actions or intimidation (see Dunlap 2017b; Mejía Carrasco 2017; Zárate-Toledo, Patiño, and Fraga 2019), the amount of money they will receive depends on two aspects. First is the area of land under lease. The more land an *ejidatario* owns, the more money they will receive. Second is the wind power infrastructure built on their terrain. By design, wind payments, therefore, reinforce social differentiation because they generate disparate patterns of accumulation according to landownership. While those with big areas of land are able to accumulate and diversify their income, those with less land struggle to meet their needs. How different people control land (Peluso and Lund 2011) – with land control understood as practices that fix or consolidate forms of access, claims and exclusion – is crucial to understanding the socio-material implications of wind power.

This is similar to findings linking solar energy and landownership which show that large landholders are able to capitalise on the transformation while smallholders are obliged to sell their labour (Stock and Birkenholtz 2019, 18). The difference with wind energy is that *ejidatarios* with little land are not immediately obliged to sell their labour. For some time, they are able to sustain themselves based on their scarce wind rents and petty agricultural production. But eventually they face a process of pauperisation that could force them to sell their land in cases of economic hardship, as this paper shows.

Wind energy expansion changes the accumulation patterns and social relations of production. For each household that succeeds through expansion and accumulation, there are others that are too poor or are unable to farm as their principal livelihood (Bernstein 2007, 403). The uneven outcomes resulting from wind power expansion in the long term allow us to explore how particular socio-material arrangements modify patterns of accumulation and class formation while interacting with patterns of landownership.

La Venta: a town engulfed by wind turbines

La Venta is an *ejido* founded in 1951 with an area of 6,509 hectares (Nahmad, Nahón, and Langlé 2014, 3; RAN 2018a; The World Bank 2006). The initial allocations of land took place in a twofold process in 1951 and 1954. When La Venta was founded in 1951, 149 plots of land were created (OGCEUM 1952, 12). One hundred and forty-eight *ejidatarios* were provided with a maximum of 10 hectares of land (The World Bank 2006; Nahmad, Nahón and Langlé 2014, 47). Three years later, in 1954, La Venta was granted additional land that was divided into 110 production units with an area of 20 hectares each distributed among the same number of *ejidatarios* (OGCEUM 1954, 26). In addition to the first 148 *ejidatarios*, who had rights over 10 hectares of land each, 110 *ejidatarios* with 20 hectares of land were added to the *ejido*.

These uneven patterns of land allocation were exacerbated because of two dynamics in the *ejido*. First, the lack of clear procedures concerning the *ejido* system allowed a local elite to control land transactions (Michel 2009). On the other hand, because of the harsh climatological conditions, most small-scale farmers simply cleared, cultivated and abandoned land as necessary. As Binford (1993, 88) puts it: 'claims to land were transient, meaningful as long as the land was under cultivation'. These dynamics have generated unequal patterns of landownership since the second half of the twentieth century, as 36 individuals own 36.8 percent of the *ejido*, while 249 individuals and seven groups of *ejidatarios* own the rest of the land (RAN 2018b).

In addition to land concentration, two trends have modified the production activity of the *ejido* (Table 1). First, over the last 25 years there has been a slow shift from arable farming to cattle grazing. The proximity of the town to the Benito Juárez dam irrigation channels made growing crops such as sugar cane, maize, beans, squash, watermelon, sorghum and sesame the main activity of the *ejido* (The World Bank 2006, 3). However,

Table 1. Agricultural land use in Juchitán 1991–2007.

Year	Crops	Land area (hectares)
1991	Maize	10,835
	Sugar cane	2,168
	Sesame	304
	Beans	257
	Sorghum	N/A
2007	Maize	2,854
	Sugarcane	N/A
	Sesame	N/A
	Beans	2.59
	Sorghum	971

N/A: Crop not available in the agricultural census.

Source: INEGI (1998, 2018a).

Table 2. Agricultural production by season.

Season	Year	Cultivated Area (hectares)
Spring-Summer	1991	8,000
	2007	3,172
Autumn-Winter	1991	4,179
	2007	373
Perennial	1991	3,975
	2007	3,168

Source: INEGI (1998, 2018a).

after the permanent closure of the sugar mill in the neighbouring town, cattle grazing has replaced arable farming (The World Bank 2006, 3). Between 1991 and 2007⁶ there was a transition from crops for human subsistence to crops associated with cattle grazing, now amounting to 81 per cent of production activity.

Similarly, there is also a trend to abandon arable farming altogether. While in 1991 there were 3,428 productive units,⁷ in 2007 the number was 1,990. The same pattern can be observed for the area under cultivation in the municipality, as it decreased from 19,000 hectares in 1991 to 9,018 (INEGI 1998, 2018a). This data illustrates the slow abandonment of agriculture by season in the region (Table 2).

In addition, land is mostly owned by male *ejidatarios*. This is not only symptomatic of the agrarian context in Mexico, where only 16.3 per cent of the *ejidatarios* are women (Katz 1999, 3), it also points to circumstances specific to La Venta. Firstly, until recently, female members of the *ejido* were not allowed to inherit land. The first-born son would immediately inherit the land. Although the 1972 agrarian reform allowed women to inherit land, this rarely happened at the local level because families would forbid marriages between women from La Venta and men from other communities because the latter would thus become landowners themselves (Cotula 2007, 32). The regularisation of the *ejido* with PROCEDE in 1998 disadvantaged women and had little impact on women's ownership and land rights (Gay-Antaki 2016, 54). Secondly, most of the female landowners are the widows of *ejidatarios* who have passed away. Even if they hold a valid claim over land, they give the land to their families, and usually the first-born sons are the ones who work the land. The combination of these two elements has fostered a situation in which only a few women work and live off the land.

Land concentration, majority male ownership, a production shift and the slow abandonment of arable farming constitute the context in which wind energy expansion takes place (see Ramirez 2019). This paper will now examine how wind power exacerbates patterns of social differentiation associated with these trends.

Patterns of differentiation among landowners

Land contracting in the Isthmus of Tehuantepec has proven to be a disorganised and chaotic process, as confusion was generated among landowners receiving unequal

⁶The 16-year difference between data is due to the fact that in these years the Mexican government conducted censuses that can be disaggregated to the local level.

⁷A productive unit is defined as the economic unit formed by one or more areas in the same municipality with agricultural activities under the same administration (INEGI 2018b).

offers to lease land for wind power (see Zárate-Toledo, Patiño, and Fraga 2019). In the south, wind power revived conflicts between those seeking the privatisation of land and those advocating communal ownership (see Dunlap 2017a); in *ejidos* wind companies obtained, not without intimidation and coercion (see Beas Torres and Girón 2010; Pasqualetti 2011), occupation and usufruct rights over land in exchange for wind rents paid to landowners.

In La Venta, wind rents can be divided into four categories: right of wind, payment for infrastructure, payment for wind turbines and payment for externalities resulting from wind infrastructure (Avilés Hernández 2008; Nahmad, Nahón, and Langlé 2014, 142). The right of wind⁸ represents the only guaranteed payment to *ejidatarios*. It is a fixed quantity per hectare, ranging from 6,000 to 8,000 pesos (from USD 244 to USD 325) to be paid on a yearly basis. The payment for infrastructure is based on the land the project utilises in square meters and amounts to up to 150,000 pesos per hectare (USD 6,100). The payment for wind turbines, amounting to up to 15,000 pesos (USD 610) depends on the exact location of the turbine and its generation capacity – from 850 kW to 3 MW. Finally, the payments for externalities refer to monetary compensation because of problems caused by infrastructure such as oil spills or unevenness in the terrain. Payments, therefore, follow the same logic: the more land one owns, the higher the payment. As a result, the amount of money that each *ejidatario* receives varies according to their landownership.

The rationale inherent in the design of wind payments has accelerated the previously discussed production trends taking place in the *ejido*. As Miguel mentioned, wind payments have allowed him to combat the harsh climatological conditions of the region by investing in high-quality cattle, feedstock and cattle sheds. He emphasised that arable farming is not worth the time nor the effort considering the amount of money he makes from cattle grazing – ten times more than when he focused on arable pasture. This is why wind energy rents enable landowners to embrace profitable activities on their land.⁹ Similarly, the additional income brought by cattle grazing allows them to invest in education and training for their families, bringing a new wave of solicitors, veterinarians and government officials, instead of agricultural labourers. The person in charge of linking the community with Acciona Energy, for instance, is not interested in working the land: there is no need for time-consuming agrarian activities when wind payments are guaranteed for the next 30 years.¹⁰ These insights show that wind power plays a defining role in reinforcing trends in production and livelihoods. Not only does wind energy accelerate the existing shift towards cattle grazing through investing rents in the more profitable activity, it also fosters the creation of a group of professionals detached from agriculture and the land in the present and the future.

Although landholders acknowledge the role that wind energy plays in the *ejido*, not all of them benefit from wind rents in the same way. What *ejidatarios* can do varies, depending on the size of their land. Owning 20 hectares of land while hosting three wind turbines is not the same as leasing four hectares of land and receiving payment for 'right of wind'. *Ejidatarios* seem to agree that the amount of land needs to be around 20 hectares for wind

⁸Colloquially defined as right of wind by *ejidatarios*, this concept refers to the usufruct received per hectare of land inside the wind energy farm (CFE 2012, 12).

⁹*Ejidatario* 22, 2017.

¹⁰*Ejidatario* 7, 2018.

energy rents to make a difference in terms of living standards and agricultural productivity.¹¹

Experiences of wind energy tend to be differentiated across towns of the Isthmus.¹² Based on fieldwork observations, four groups of landowners, with contrasting experiences of wind energy development and land dynamics, can be identified in La Venta. This includes landowners with more than 20 hectares of land, landowners with less than 20 hectares of land, landowners whose land was not included in the wind farm project, and landowners who have sold some or all of their land. Their experiences enrich our understanding of how wind investment reinforces processes of differentiation and agrarian change in each of these subgroups.

Landowners with more than 20 hectares

It is common among landowners with more than 20 hectares to combine wind rents with investments in arable farming, cattle grazing and machinery. This allows them to re-invest their money and build resilience against economic and environmental shocks.

Damián's case illustrates patterns affecting this subgroup. He decided to rent over 40 hectares of land to the Eurus wind farm, out of which he cultivates 35 with sorghum and maize. On the remaining five hectares he has around 20 heads of cattle that he feeds with his own sorghum. Damián's income combines the payment he receives from 40 hectares of land, his production of maize and sorghum, and the milk he sells on a daily basis to cheesemakers in the region. In case of an economic shock affecting crop prices, Damián can rely not only on selling milk, he can also sell his cattle, if needed. Ultimately, he can rely on the payments from the wind power company, which amount to approximately 320,000 pesos (USD 13,013).¹³

Cirilo's case also shows how large landholders are able to capitalise on the energy transitions taking place in La Venta. Cirilo was part of the *ejido* commissariat in 2004 when Acciona Energy sought to secure land in the south of the *ejido* for the wind farm. Since he was one of the brokers promoting the project in the local community, he managed to lease over 40 hectares of land to the project. Just like Damián, Cirilo has been able to diversify his income. He owns over 100 heads of cattle, from which he obtains around 70 litres of milk per day, sold for six pesos (USD 0.24) per litre. In addition, he cultivates five hectares of maize that he sells to other members of the community.¹⁴ Most importantly, Cirilo bought a tractor and, when he is not using it, he rents it to other farmers in town. As his income is from multiple sources, he can continue to reinvest in productivity.

Migdalia's case details the gendered patterns that prevent further capitalisation of the energy transition taking place in the town. She started the paperwork to become an *ejidataria* almost 15 years ago. She was one of the first women to participate in the *ejido* assemblies when Acciona Energy approached the town.¹⁵ She participated in the

¹¹*Ejidatario* 30, 2017.

¹²Arrival procedures in terms of contracts and conflict are different in other towns of the region. See Dunlap's work in La Ventosa (2017b), Juchitan (2017b) and Álvaro Obregón (2018), Mejía's work on San Dionisio del Mar (2017), and Cruz Rueda's paper on San Mateo del Mar (2011).

¹³*Ejidatario* 13, 2019.

¹⁴*Ejidatario* 31, 2019.

¹⁵*Ejidataria* 19, 2018.

regularisation of the *ejido* under the PROCEDE programme; she recounted how as a result the government officials visited the land to measure, delimitate and to expedite the property certificates of various tracts of land. This was a key moment in wind energy development in the town, as wind energy investors require ownership certainty to develop their projects. Migdalia and her husband owned 43 hectares of land in the north of the town, where the company decided to install 16 wind turbines.¹⁶ They would cultivate sorghum on this land, obtaining three to five tonnes per hectare. The income from wind energy rents on top of what she obtained from selling her sorghum allowed her to invest in machinery, high-quality seeds, pesticides and fertilisers. However, Migdalia's investment was interrupted by divorce and the sudden death of her former husband. After these events, Migdalia entered into a legal dispute with her former husband's partner over who had legitimate claim to the land. The legal dispute resulted in the agrarian judge putting any production on the land on hold until the landownership claim is resolved.¹⁷ Thus, Migdalia can no longer work the land and has had to find ways to diversify her income. To this end, she opened a small canteen on the highway, invested in a cybercafé and set up a place for Zumba lessons. Branching out into different ventures, however, also meant that her daily routine changed and she now has to juggle her time between different activities. Her days usually start at five in the morning and finish at nine in the evening when she closes the cybercafé. Migdalia's experiences demonstrate the gendered patterns associated with female large landholders. Her ability to diversify her income was undermined by a legal case that prevented her from working the land. However, she was able to sustain her income by investing in the urban economy of La Venta.

Finally, Ernesto's insights also reveal the increasing differentiation experienced by this subgroup of landowners. As one of the wealthiest *ejidatarios* in town, Ernesto owns a total area of 38 hectares of land. On his 18 hectares in the south, Ernesto has 20 heads of cattle and cultivates sorghum and maize on four hectares of land per annum with a production level of 2.5 tonnes per hectare. In his 20 hectares to the north of the town he cultivates sorghum on 15 hectares only because the remaining hectares are located on unproductive rocky soil. While most of the landowners in the north of the town were affected in previous seasons by a sorghum plague (Manzo 2015), Ernesto was able to invest in pesticide and fertiliser with the profit obtained from wind energy rents. Although not many people are willing to sell their land,¹⁸ Ernesto is one of the very few *ejidatarios* who have been able to buy land after wind power investments came to the town.¹⁹ He also acquired a tractor to boost productivity during the harvest season, which he rents out when he does not need it. Ernesto has been able to diversify his income from various sources and capitalise on the steady income of wind rents.

This subgroup shows that the payments received from leasing 20 or more hectares of land allow landowners to combine wind energy payments with investments in crops, cattle grazing and machinery. This not only enables them to re-invest in productivity, it has also allowed a few of them to buy land inside the wind energy farm. Nonetheless,

¹⁶*Ejidatario* 19, 2018.

¹⁷*Ejidatario* 19, 2019.

¹⁸When enquiring into *ejidatarios* engaging in land transactions, I was only able to identify between 10–12 people in the town.

¹⁹Ernesto did not reveal how many hectares he was able to buy since wind investment had come to the town.

as Migalia's case shows, women landowners are at a clear disadvantage, and this has prevented her from further capitalising on the wind industry.

Landowners with less than 20 hectares of land

While landowners with more than 20 hectares manage to diversify their income, those with less than 20 hectares barely manage to combine wind turbines with other productive activities on their terrain. Since payments resulting from wind investments do not make a difference to their productivity or livelihoods, they are more vulnerable to economic and environmental shocks.

José's case depicts the patterns of social differentiation taking place in this subgroup. When the project started, he decided to lease four hectares of land to Acciona Energy in southern La Venta. Because of a mobility impairment, he used to cultivate maize and sorghum with the help of his family. However, when his father died, José could not continue with such a laborious activity and he found himself forced to let the land fallow. He recounted that the 20,000 pesos (USD 813) he receives on a yearly basis are seldom enough for his basic needs. He has not been able to make any investments in agriculture or cattle grazing and his tract of land is completely untilled.²⁰ José spends most of his time and money on basic needs and transport between towns, and he depends on his family for additional needs. For José, wind energy rents barely make a difference in terms of productivity or living standards because of the additional challenges of his impairment and the abandonment of his land.

Similarly, Raul's experience is demonstrative of the issues this subgroup faces. He owns nine hectares of land divided into two plots: six hectares in the north and three hectares in the south. In the north, he cultivates endemic maize, keeping some for self-consumption while the rest is sold to other members of the community.²¹ He recounted that maize productivity in the region has decreased significantly over the last few years because of low rainfall (see Gamboa 2008). While in the past he would harvest an average of eight carts of corn per hectare, in the last five years he has only been able to obtain a quarter of that, approximately two carts per hectare. In the three hectares in the south of the town, he has 15 heads of cattle grazing in open air. This is because he has not been able to invest in a shed nor in electricity for his tract of land. Consequently, his productivity is low. Rather than being an investment, his heads of cattle function as an insurance in case of an economic or environmental shock.

Raul's land also hosts three wind turbines: two in his northern tract and one in the southern terrain. In his experience, wind turbines are responsible for two environmental effects that have negative consequences for agriculture.²² Firstly, there are oil spills from the turbines (see Nahmad, Nahón, and Langlé 2014). When oil drips from the turbines, the crops turn yellow. There is also an issue with dust coming from the roads built by the wind energy enterprise. Since the roads are not paved, machinery driving by creates a cloud of dust that affects the productivity of the adjacent terrain.²³ To put it in his own words: 'what would happen if you were in the middle of a cloud of dust? You would not be

²⁰*Ejidatario* 30, 2017.

²¹*Ejidatario* 38, 2019.

²²*Ejidatario* 38, 2019.

²³*Ejidatario* 38, 2019.

able to breathe, right? This is what happens to maize and sorghum' (see also Lucio López 2016).²⁴ Raul's low productivity indicates that smallholders are affected not only by the low amount of money from the enterprise, but also by the environmental impact of the wind energy industry on their land.

Victor's account details the process whereby those who own less land in the *ejido* are unable to invest to boost productivity and, in some cases, may be forced to sell their land. Victor recounted how his subgroup is also more vulnerable to the adverse environmental effects of wind turbines combined with the uncertainty of climate change. He said that wind power development affects bird migration patterns and consequently the agricultural activities of the *ejido*. In his years as a farmer, he has observed how wind turbines have decreased the bat population in the region because they get trapped into the turbulence generated by the turbine blades (Ledec, Rapp, and Aiello 2011). Before the wind turbines, bats would feed on an aphid plague that affects sorghum. However, as bats are now scarce, the aphid population thrives, harming the crops. As Victor puts it, the plague affects landowners in different ways: while those with vast areas of land use money from the wind rents to eradicate pests by investing in pesticides and fertilisers, those with small areas of land have insufficient resources to cope with this blight on their crops. Victor highlighted that the 20,000 pesos (USD 813) he receives a year are not enough to invest in high-quality sorghum, nor can he afford pesticides and fertilisers. As such, those with small areas of land risk losing most of their harvest and they may not have the means to re-invest in the future. Some small landowners, as we will see in the next subsection, may find themselves obliged to sell their land as a contingency.²⁵

Lastly, Juanita's case informs the gendered aspects of social differentiation affecting this subgroup. She inherited four hectares of land when her father died in 2007. She cultivates maize twice a year and her productivity hovers at around five to six carts per hectare. She uses most of her production for household consumption: her mother, her sister and herself. Because the income she receives from wind rents barely makes a difference, she has a grocery shop to cover her basic needs.²⁶ Her hardship has increased in recent years because of the volatility of the price of petrol and the uncertainty in weather patterns in La Venta. In order to overcome these challenges, she invested in a poultry project with over 100 birds, which she hoped to sell to members of the community. She was wondering whether she had the means to explore another business venture, however she was too busy looking after her elderly mother and covering shifts in her grocery shop. Juanita's circumstances demonstrate not only the hardship associated with owning a few hectares of land, but also the gendered aspects of differentiation that result from combining household duties with production activities.

It is important to mention that even if wind energy payments do not make a difference for landowners in terms of agriculture, productivity or living standards, they constitute a form of insurance that has prevented small-scale farmers from selling their land or from migrating to other regions or countries. Climatic uncertainty means productivity levels can decrease drastically, and if there is a plague or a drought, the wind rents prove to

²⁴*Ejidatario* 38, 2019.

²⁵*Ejidatario* 22, 2017.

²⁶*Ejidataria* 33, 2019.

be essential for basic needs. As Raul put it: ‘if it were not for the income received from the wind turbines, I would have been obliged to sell the land or to migrate to a different region in the country’.²⁷ The safety net provided by the rents is a key aspect of the process of social differentiation resulting from wind power (see also Baka 2016; Brock and Dunlap 2018; Dunlap 2017a). Rather than generating open dispossession, wind energy brings about a process of slow pauperisation amongst landowners because the rents barely make a difference in terms of productivity and, for some small landholders, this hardship is reinforced by patterns of differentiation. Wind energy expansion allows the large landowners to boost their investments while those with small areas of land are pauperised. Nevertheless, this is not to say that land deals do not take place in La Venta, as this paper will explore in the next subsection.

Landowners who have sold their land

Since wind energy investment came to La Venta, land deals have been scarce because of two factors. On the one hand, wind energy companies are leasing almost all of the land in the *ejido*. This means that people do not want to sell because eventually they will receive money from a wind energy farm. On the other hand, and related to this, the possibility of receiving an income from wind energy companies has galvanised a speculative process in the region, also referred to as rural gentrification, which has led land prices to increase over the long term (see Dunlap 2017b). Before wind energy expansion, a hectare of land would cost around 50,000 pesos (USD 2,033). After the wind energy rush, the same area of land would cost around 250,000 pesos (USD 10,167). These two elements have resulted in few land transactions in La Venta. According to the *ejidatarios*, there are only 10–12 landowners who have sold their land over the recent years, mostly owing to old age or ill health.²⁸ Although small, this subgroup sheds light on processes of land accumulation and dispossession resulting from wind energy expansion.

Eusebio’s case is relevant here. He is a landless peasant who was widowed in 2013. Eusebio owned 5.83 hectares of land to the north of the town. On this land, he was able to cultivate only two hectares, as the rest of the tract was located on rocky soil.²⁹ He would grow endemic maize, pumpkin, beans and watermelon in small quantities. He was able to draw between five and six carts of maize per hectare, most of which was used for self-consumption. Eusebio was obliged to sell his land after his wife fell ill with cancer in 2013. Although she had popular insurance,³⁰ she could not get the entire treatment paid for by the Mexican government. Eusebio was obliged to sell his land to pay for her treatment. Since he needed the money urgently, he had to sell his land through an intermediary for 50,000 pesos (USD 2,033) per hectare – a fifth of the average price. Similarly, he had to sell all of his cattle and the maize he had stored for the year. Most importantly, however, Eusebio was obliged to sell his certificate to use

²⁷*Ejidatario* 38, 2019.

²⁸*Ejidatario* 36, 2019.

²⁹*Ejidatario* 24, 2019.

³⁰Popular insurance refers to a sort of social security provided by the Mexican government, also known as Seguro Popular. This kind of social security only pays for some kinds of treatment; for other procedures, the user is liable for the cost (SSP 2019).

the commons in the *ejido*.³¹ This means that he is not allowed to participate in the *ejido* assemblies that take place in the town twice a year. Eusebio, therefore, epitomises what in La Venta is referred to as 'landless *ejidatario*'.

Mardonio's narrative is also helpful in understanding patterns of difference arising from this subgroup. In 2017, he sold 3.15 hectares of land because his wife got cancer. Since the chemotherapy was expensive and took place in Oaxaca City – a seven-hour coach trip from La Venta – he needed some extra income. Furthermore, when he took his wife to Oaxaca City, there was a strike by popular insurance workers. This meant that Mardonio's wife could not obtain treatment in the public health system. In consequence and because of the urgency, Mardonio and his wife decided to pay for the treatment with a private practitioner. Each trip to Oaxaca would represent around 7,500 pesos (USD 305) in accommodation and transportation and around 2,500 pesos (USD 102) in daily expenses. They only made seven trips to Oaxaca City because his wife's condition worsened in the final months of her life. She was in bed for five months and Mardonio spent approximately 2,500 pesos (USD 102) on medicine. In addition to the economic shock, Mardonio was not able to work during this time because he suffers from a back condition that prevents him from walking, carrying heavy loads or working the land. Mardonio had no option other than to sell some of his land.³² However, unlike Eusebio, Mardonio managed to sell it to a relative and he obtained a better deal in the transaction, retaining four hectares of fallow land.³³ This case offers insights into the combination of factors, from deficiencies in the public health system to the remoteness of rural areas, which can lead to someone selling their land.

Accounts from this subgroup show that the *ejidatarios* that have sold their land have done so because of the challenges of coping with economic shocks. While some of them have managed to keep their land, others have had to sell their right to use the common area in the *ejido*, becoming 'landless *ejidatarios*'. Although small, this subgroup illustrates a slow yet meaningful process of dispossession associated with land deals in a Mexican agrarian setting. In turn, *ejidatarios* with large tracts of land are able to capitalise on wind expansion by acquiring land from other *ejidatarios* (see Hall 2013).

Landowners whose land was not included in the wind farms

Landholders whose land was not considered for the wind farms were active members of Solidarity Group La Venta.³⁴ This group was made up of approximately 120 members who protested against the wind energy industry because of the low prices paid to landowners. When contracts were first signed between *ejidatarios* and wind companies in 2004, they decided to reject the payments offered and, consequently, their land was not included in the projects. Therefore, even if their tracts of land are inside the area leased by the wind company, they do not receive any compensatory payments if their land is affected.

³¹*Ejidatarios* have the right to use two different types of land: they can use a parcel of land over which they have the right of use and usufruct; and they have the right of use on a collective section of the *ejido*. This is also known as the certificate of common use.

³²*Ejidatario* 27, 2019.

³³*Ejidatario* 27, 2019.

³⁴Solidarity Group La Venta was formed to protest against the low prices offered by wind enterprises to *ejidatarios*. This group has been disbanded in the long term through repression (see Beas Torres 2012; Quintana 2018) and managerial approaches such as the establishment of a workers' union in the town (field notes, March 2018).

Accounts from this group highlight patterns of broader social differentiation affecting those who did not receive payments from wind companies yet still suffer the consequences of the industry's activities.

While recounting the evolution of wind turbines in La Venta, a landowner, Sabino, told me that he decided not to sign the contract with the wind companies because the payment was not what he expected. Rather than the 3,000 pesos (USD 122) offered by the enterprise, Solidarity Group La Venta demanded a payment of 30,000 pesos (USD 1,220). Sabino owns 11.5 hectares of land in the middle of the wind farm, cultivating 10 hectares of maize with an average production of one cart per hectare,³⁵ and six hectares of land in the northern part of the wind project, where he cultivates sorghum. His sorghum productivity has been affected by the weather and he manages to cultivate less than one tonne per hectare.³⁶ Since his terrain is in the middle of the wind farm, Sabino's land suffers from the dust raised by wind machinery on the roads. In his northern terrain, the wind energy enterprise built a drainage system to help the water flow outside of the wind farm during the rainy season. However, according to Sabino, the channel is too narrow to drain the average yearly precipitation and his terrain is flooded.³⁷ This ultimately undermines his agricultural productivity because he does not receive any compensation from the enterprise. As a result, he is obliged to find additional resources to cope with these challenges.

Vicente's experience is also relevant to this subgroup. He recounted the experience of another landowner who signed a contract with TELMEX (Mexican Telecommunications) to lease his land for the installation of an antenna. Even if TELMEX was only leasing 10 square meters, they were offering a payment of 60,000 pesos per year (USD 2,440). This stark contrast in the two offers made by the wind enterprises is why Vicente decided not to include more than 40 hectares of land in the project.³⁸ His rationale for this decision was that he was making more money from cattle grazing than he would earn from the wind energy project. In addition, environmental factors during the construction phase would have hindered his productivity and the company would not have compensated him for any loss. Accordingly, he decided to reject the offer altogether.

As in Sabino's case, Vicente's terrain is to the north of the wind energy farm. He has 45 heads of cattle focused on milk production. He obtains his income from selling milk in surrounding towns and selling male calves to other farmers. Although externalities from the wind power industry do not have a significant impact on his productivity, he is still affected by dust. This is because there is a road approximately 150 meters to the north of his land and another one 70 meters south. As Vicente puts it, whenever machinery circulates, a cloud of dust rises from the roads and affects the terrain.³⁹ As with other members of this subgroup, because Vicente did not sign the contract, the company does not pay for the damages caused by these externalities.

Finally, Alejandro's case is relevant to the discussion of this subgroup. Alejandro's family owns 54 hectares of land divided into two tracts: 24 hectares in the north of the town and 30 hectares in the south. In both areas he combines agriculture, mainly

³⁵*Ejidatario* 18, 2019.

³⁶*Ejidatario* 18, 2019.

³⁷*Ejidatario* 18, 2019.

³⁸*Ejidatario* 36, 2019.

³⁹*Ejidatario* 36, 2019.

sorghum, with approximately 90 heads of cattle. While he cultivates in both areas, he manages to alternate the land upon which his herd grazes on a yearly basis. Although his sorghum harvest is similar to the levels reported by other *ejidatarios*, around three or four tonnes per hectare, he needs to invest in pesticide and fertiliser to increase productivity without having the additional income that other landholders obtain from wind power companies. In addition, he decided not to cultivate his terrain for two years because his eldest brother passed away and his family did not have enough money to undertake cultivation.⁴⁰ Alejandro's productivity is affected by oil spills from wind turbines around his land. He recounted that in the rainy season some of the terrain in the north is flooded. When this happens, the water flows through his terrain, meaning the oil flows towards his land. This ultimately affects his sorghum productivity. He was considering whether legal action against the enterprise to obtain compensation for the damage would be worthwhile. Alejandro's case, in this sense, shows how certain members of this subgroup, albeit with large areas of land, are subject to patterns of social differentiation associated with economic shocks and the environmental consequences of the wind industry.

To sum up, some common threads arise from the accounts of landowners whose land was not included in wind energy projects. Firstly, they used to be members of the group opposing wind energy projects in La Venta and they decided against leasing their land to wind companies in protest against the low prices being proposed. Secondly, because members of this subgroup own large areas of land, the multiple activities and assets on their terrain compensate for the lack of payment from wind companies. Therefore, these landowners have been able to obtain an income that allows them to survive and continue with their investments. This does not mean, however, that they are exempt from economic shocks. Alejandro, for instance, gave up cultivating for two years because of the death of a relative. Finally, although their terrain is affected by the environmental impacts of wind energy, this subgroup does not receive compensatory payments for any disruption or damage, unlike landowners who decided to sign a contract with wind companies.

Conclusion

This paper has argued that wind energy expansion in La Venta over the last 25 years has exacerbated and reproduced patterns of social differentiation among landowners, allowing some to consolidate forms of control over land according to their landownership while pauperising others. While in La Venta production activities co-exist with wind farming, these dynamics contrast with other wind farms in the region held under different landownership schemes. The key element in La Venta is that the more land one owns the more likely one is to receive a higher rent. In an *ejido* where land allocations were skewed towards a few hands at its foundation and land deals are regulated by the Agrarian Law, large landholders have capitalised on the wind industry by diversifying their income and differentiating their trajectories from those with less land.

The socio-material arrangements brought about by wind energy in the *ejido* La Venta have allowed small landholders to sustain their livelihoods by relying on their petty

⁴⁰*Ejidatario* 26, 2019.

agricultural productivity and using wind rents as a safety net. This suggests that, in the *ejido* land system, pauperisation rather than displacement is a likely outcome for this subgroup. On the other hand, although land deals have been scarce over the last 25 years, owing to regulations under the Agrarian Law, some *ejidatarios* have faced economic shocks associated with health scares, selling their land to intermediaries below market price or giving away their productive land. This has created 'landless *ejidatarios*': a group wavering between informal employment and petty agricultural productivity. Finally, for those whose land was not included in the wind projects, their experiences of wind energy revolve around negative environmental externalities undermining their productivity without economic compensation. It seems, nonetheless, that they are able to cope and adapt, as they own large holdings of productive land. The social differences exacerbated by wind power in La Venta highlight the need to incorporate debates on land control and green grabbing into the analysis of processes linking renewable energies with agrarian change.

The different outcomes among landowners in La Venta also suggest different dynamics to other accounts in the south of the region portraying landholders as passive entities waiting for their monthly payments or as those making real gains from the energy transition (see Dunlap 2019; Ramirez 2019). They also suggest that dynamics of exclusion and displacement from land analysed in other wind projects (see Dunlap 2017a; Siamanta 2019) might not be immediate outcomes for small landholders in the *ejido* system. This allows for the reproduction, if not the exacerbation, of certain patterns of accumulation, class structures and social relations of production (Franquesa 2018) by enabling landowners with more than 20 hectares to capitalise on the transition to renewable energy. Finally, this paper also challenges the idea that productive activities are prevented in land leased out for wind power (Backhouse and Lehmann 2020, 379), by showing the range of activities undertaken by landowners subgroups.

Tracing the social differentiation patterns and the way in which they are mediated by gender, with *ejidatarias* facing additional challenges that limit their investments and livelihoods, remains an important line of research that could further our understanding of long-term agrarian change brought about by wind energy expansion (Akram-Lodhi and Kay 2010; Kay 2015). As renewable energies expand across rural areas in response to the climate crisis, it is important to track the uneven outcomes resulting from these investments and their interlinkages with local patterns of social difference and land dynamics.

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