

# FARMERS' PERCEPTIONS OF WIND ENERGY IN THE UMARIZEIRO COMMUNITY, LAGOA NOVA, RN.

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## Abstract

In recent years, the wind energy sector in the state of Rio Grande do Norte has expanded significantly, establishing itself as Brazil's leading producer of wind power. Although regarded as a renewable and clean source, wind energy is frequently associated with negative externalities that affect neighboring communities. In this context, the present study investigates the perceptions of farmers from the Umarizeiro community, located in Lagoa Nova–RN, regarding the externalities associated with the Acauã III Wind Farm. Adopting a qualitative approach, the research involved semi-structured interviews with farmers residing near the wind complex. The results highlight key perceived impacts, including noise pollution, dust, deforestation, poor road maintenance, and restricted access to public policies—such as PRONAF, whose credit approval reportedly became contingent upon authorization from the wind company. Additionally, the increase in municipal revenue did not translate into tangible improvements in public services for the community. Grounded in the principles of energy justice, the study reveals distributive, procedural, and institutional inequalities in the relationship between the wind project and local residents. Finally, it suggests the need for mitigation strategies that align energy generation with agricultural sustainability and the well-being of affected populations.

**Keywords:** Wind energy. Negative Externalities, Energy Justice, Local Community, Farmers.

## Resumo / Resumen

### PERCEPÇÕES DOS AGRICULTORES SOBRE A ENERGIA EÓLICA NA COMUNIDADE DE UMARIZEIRO, LAGOA NOVA, RN.

Nos últimos anos, o setor eólico potiguar expandiu-se significativamente, consolidando-se como o maior produtor de energia eólica do Brasil. Embora considerada uma fonte renovável e limpa, a energia eólica é frequentemente associada a externalidades negativas que afetam comunidades vizinhas aos parques. Neste contexto, o presente estudo investiga as percepções dos agricultores da comunidade do Umarizeiro, em Lagoa Nova–RN, sobre as externalidades associadas ao Parque Eólico Acauã III. Com abordagem qualitativa, foram entrevistados agricultores residentes no entorno do parque, por meio de questionários semiestruturados. Os resultados evidenciam como a poluição sonora, a poeira, o desmatamento, a manutenção precária das estradas e a restrição ao acesso a políticas públicas — como o PRONAF, cuja liberação de crédito passou a depender da autorização da empresa eólica — configuram os principais impactos percebidos. Além disso, o aumento da arrecadação municipal não resultou em melhorias nos serviços públicos da comunidade. Fundamentado nos princípios da justiça energética, o estudo revela desigualdades distributivas, processuais e institucionais na relação entre o empreendimento e os moradores locais. Por fim, sugere a necessidade de estratégias de mitigação que articulem geração de energia, sustentabilidade agrícola e bem-estar das populações afetadas.

**Palavras-chave:** Energia Eólica, Externalidades Negativas, Justiça Energética, Comunidade Local, Agricultores.

### PERCEPCIONES DE LOS AGRICULTORES SOBRE LA ENERGÍA EÓLICA EN LA COMUNIDAD DE UMARIZEIRO, LAGOA NOVA, RN.

En los últimos años, el sector eólico del estado de Rio Grande do Norte se ha expandido significativamente, consolidándose como el mayor productor de energía eólica de Brasil. Aunque se la considera una fuente renovable y limpia, la energía eólica está frecuentemente asociada a externalidades negativas que afectan a las comunidades vecinas a los parques. En este contexto, el presente estudio investiga las percepciones de los agricultores de la comunidad de Umarizeiro, en Lagoa Nova–RN, sobre las externalidades asociadas al Parque Eólico Acauã III. Con un enfoque cualitativo, se realizaron entrevistas semiestructuradas a agricultores que residen en las proximidades del parque. Los resultados destacan como principales impactos percibidos la contaminación sonora, el polvo, la deforestación, el mal estado de las carreteras y las restricciones al acceso a políticas públicas — como el PRONAF, cuya aprobación de crédito pasó a depender de la autorización de la empresa eólica. Además, el aumento de la recaudación municipal no se reflejó en mejoras tangibles en los servicios públicos de la comunidad. Basado en los principios de la justicia energética, el estudio revela desigualdades distributivas, procesuales e institucionales en la relación entre el emprendimiento y los residentes locales. Finalmente, sugiere la necesidad de estrategias de mitigación que articulen generación de energía, sostenibilidad agrícola y bienestar de las poblaciones afectadas.

**Palabras-clave:** Energía Eólica, Externalidades Negativas, Justicia Energética, Comunidad Local, Agricultores.

## INTRODUCTION

Wind energy production in the state of Rio Grande do Norte (RN) began in 2004 with the implementation of a wind farm by Petrobras, designed for self-consumption and located in the municipality of Macau–RN. The project included three wind turbines, totaling an installed capacity of 1.8 MW (Azevedo et al., 2015). Since then, RN has attracted numerous wind energy projects. To illustrate this dynamic, in the last ten years alone, the installed capacity of wind power plants in the state, under the management of the National Electric System Operator (ONS), has grown by 949.3%, increasing from 1.042 GW in 2014 to the current 9.892 GW (ONS, 2024).

However, alongside this growth, numerous challenges have emerged due to the negative externalities associated with these developments. A literature review identified studies addressing the impacts and/or conflicts arising from wind energy projects in RN, highlighting socio-environmental conflicts related to land use and occupation (FARIAS et al., 2023; CAAC, 2015), socio-economic impacts (SILVA, 2019; SILVA & AZEVEDO, 2024), and effects on health, crime, drug use, and child prostitution (COSTA, 2015).

The reviewed literature also shows that different regions experience distinct impacts and conflicts, indicating that the topic has not been exhaustively explored. Thus, new studies are necessary to identify and understand these challenges. In this context, the present work aims to understand farmers' perceptions of the externalities associated with the implementation of the Acauã III Wind Farm in the Umarizeiro community, located in the municipality of Lagoa Nova–RN.

This study contributes to deepening the understanding of the disputes surrounding the energy transition in the semi-arid region of RN, demonstrating how the implementation of a wind project in a rural community with an agri-food vocation compromises both the material conditions for the reproduction of family farming and the symbolic bonds sustaining territorial permanence. The analysis, grounded in the perspective of energy justice, highlights that the impacts go beyond environmental dimensions, affecting rights, access, and historically constructed forms of belonging. By confronting institutional promises of modernization and sustainability with the realities experienced by Umarizeiro farmers, the study also offers a critical reading of official discourses on the energy transition.

In this sense, identifying and understanding the negative externalities associated with the introduction of wind farms in rural areas is essential to generating knowledge that contributes to the development of mitigation strategies for environmental, economic, and social impacts that may arise at different stages of wind project implementation. Therefore, the contributions from this research can guide decision-making and the implementation of measures that ensure a balance between renewable energy generation and the preservation of living conditions for residents of rural communities directly affected by wind projects.

## STUDY AREA

The municipality of Lagoa Nova is located in the Serra de Santana Microregion, in the state of Rio Grande do Norte, approximately 208 km from the capital, Natal. With a territorial extension of 176.302 km<sup>2</sup>, it borders the municipalities of Bodó, Cerro Corá, Currais Novos, Santana do Matos, and São Vicente (Figure 1).

Lagoa Nova has a population of 15,573 inhabitants and has historically had an economy based on agriculture, commerce, and extractivism, according to data from the Brazilian Institute of Geography and Statistics (IBGE, 2024). However, this economic dynamic underwent a significant transformation beginning in 2012, when construction began on the Calangos Wind Complex in Bodó, a neighboring municipality. This development stimulated new economic activities in Lagoa Nova focused on hospitality and food services. In 2014, with the beginning of construction on the Serra de Santana I and II wind farms, the municipality also started to host large-scale civil construction activities (SOUZA, 2015).

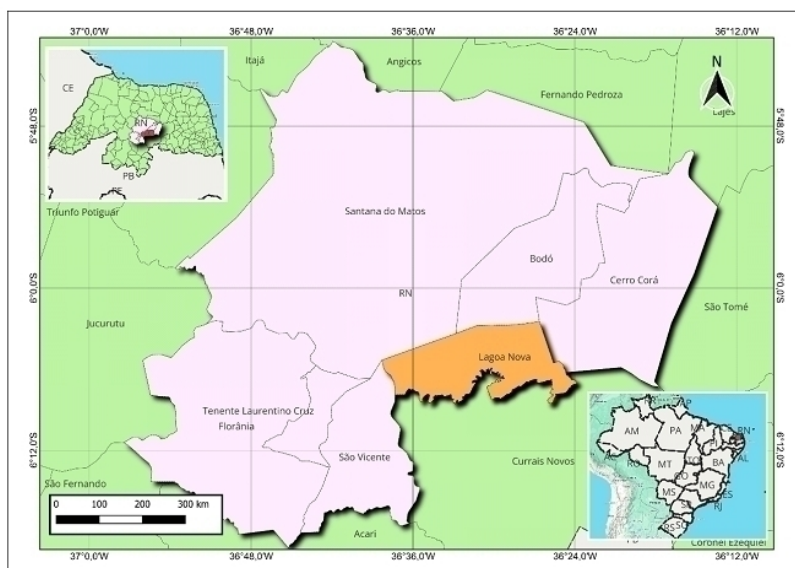


Figure 1 - Municipalities of the Serra de Santana microregion, Rio Grande do Norte. Source: IBGE (2023). Datum: SIRGAS 2000. Prepared by the authors (2024).

Currently, the municipality hosts seven operational wind farms: Acauã III, Calangos 3, Macambira II, Santana I and II, and Serra de Santana II and III (Figure 2). Together, these parks have an installed capacity of 150,800 kW, consolidating Lagoa Nova as an important hub for renewable energy generation in the Serra de Santana Microregion (EPE, 2024).

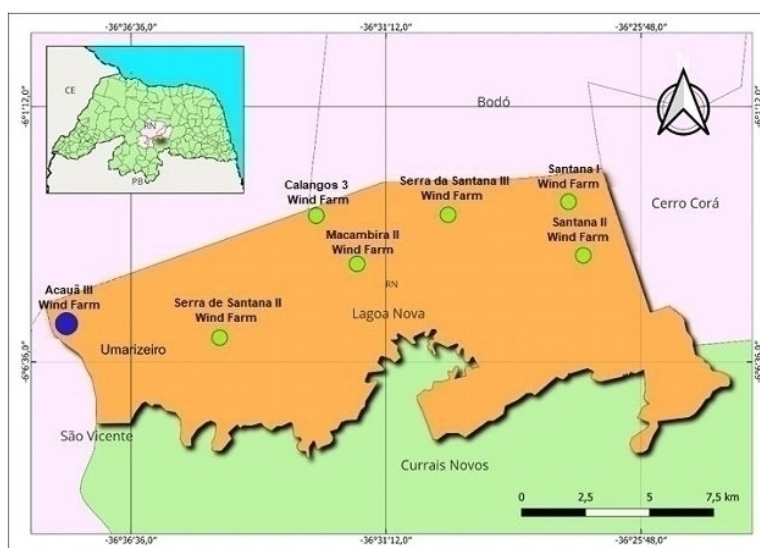


Figure 2 - Operational Wind Farms in the municipality of Lagoa Nova - RN. Source: EPE (2024), IBGE (2023). Datum: SIRGAS 2000. Prepared by the authors (2024).

The Acauã III Wind Farm, the focus of this study, is part of the Acauã Wind Complex, a project with an installed capacity of 109.2 MW, composed of 26 wind turbines distributed across four wind farms: Acauã I, II, III, and Baixa do Sítio. The complex spans the municipalities of Lagoa Nova, Santana do Matos, São Vicente, and Tenente Laurentino Cruz. Located in the rural community of Umarizeiro and operational since August 28, 2023, the Acauã III Wind Farm comprises four wind turbines, each with a capacity of 4.2 MW, totaling an installed capacity of 16.8 MW (ANEEL, 2024).

## LITERATURE REVIEW

The expansion of wind energy in Brazil, especially in the northeastern semi-arid region, has been underpinned by narratives of ecological modernization and sustainable energy transition. However, various studies demonstrate that beneath this green discourse lie processes of deterritorialization, unequal distribution of risks and benefits, and environmental injustice (Klingler et al., 2023; Frate et al., 2024; Santana & Silva, 2021).

In the field of energy geography, the concept of energy justice has gained prominence, emphasizing distributive, procedural, and recognition dimensions (Sovacool et al., 2017; Jenkins et al., 2016). This analytical framework has been applied across different territorial contexts to examine social and spatial asymmetries generated by renewable energy projects.

In Brazil, Frate et al. (2024) employ Q methodology to reveal different subjectivities surrounding a wind farm on the northern coast of Rio Grande do Norte, highlighting contrasting perceptions of procedural and distributive justice. Similarly, Dantas et al. (2019) analyze the community of Galinhos, showing how wind energy impacts reconfigure local politics and community relations. In Enxu Queimado, Pereira et al. (2024) highlight territorial appropriation and social resistance processes in response to the installation of wind turbines, interpreting the energy transition as a new frontier of accumulation by dispossession.

At the international level, authors such as Vasstrom and Lysgård (2021) address the case of Norway through the lens of actor-network theory and energy justice, illustrating how local conflicts necessitate a reevaluation of national energy policies. Brandstedt et al. (2024), in turn, propose an engaged ethical approach to procedural justice, valuing deliberative processes in building legitimacy for energy decisions.

The literature also points to the limitations of traditional approaches in addressing social inequalities. Velasco-Herrejón and Bauwens (2020) introduce intersectionality as a theoretical key to understanding how race, class, and gender shape differentiated experiences of injustice in energy systems. Simcock and Mullen (2021) expand this critique, arguing that distributive justice must be accompanied by the recognition of local identities and histories in wind farm siting decisions.

In the United States, Smythe et al. (2025) document how coastal communities experience multiple injustices during the transition to offshore wind energy, while Brisbois et al. (2023) discuss the concept of “diluted justice” in institutional contexts with low social accountability. Klingler et al. (2023) use the term green grabbing to describe how land appropriation under the guise of clean energy perpetuates land-grabbing practices. Ameli et al. (2021) highlight that foreign investors dominate the sector, concentrating decision-making power far from the affected territories.

These findings align with those of Smythe et al. (2025) and other authors who analyze institutional blockages and the role of the state in mediating energy conflicts (Busch et al., 2022; Lycke et al., 2024). Finally, studies such as Fischer et al. (2021) and Ramasar et al. (2023) reinforce that processes of acceptance and resistance to wind energy are mediated by symbolic and material disputes over territory.

Drawing on these contributions, the present article situates itself within the field of critical energy geography, interpreting perceived externalities — that is, the impacts not internalized by wind energy enterprises — as concrete expressions of territorial injustice, institutional neglect, and sociopolitical exclusion in the context of ongoing energy transitions.

## METHODOLOGY

To achieve the objectives of this study, interviews were conducted with farmers residing within a maximum distance of 2 kilometers from the Acauã III Wind Farm, located in the Umarizeiro community, in the municipality of Lagoa Nova-RN. The research instrument was a semi-structured questionnaire, comprising both open and closed questions, designed to gather relevant information regarding the farmers’ perceptions of the externalities associated with the wind farm.

The delimitation of the 2 km radius is justified by the fact that the Umarizeiro community is situated in a municipal border zone between Lagoa Nova, São Vicente, and Santana do Matos—an area

where the political-administrative boundaries are not clearly defined and are often unknown even to the residents. This ambiguity could compromise the sample's homogeneity, particularly in terms of territorial belonging and direct experience with the project's impacts. Furthermore, several communities and settlements are located near Umarizeiro, reinforcing the need to restrict the research universe to a radius that ensures the effective inclusion of participants in the socio-spatial context directly affected by the wind farm. Thus, the adoption of this territorial criterion aims to preserve the coherence and specificity of the sample.

The sampling method used in this study was purposive sampling, which enabled the selection of 30 individuals to participate in the research. Data collection was carried out between March and August 2024. The questions in the questionnaire were categorized as follows: positive and negative impacts affecting the community, job creation and improvements in the local economy, quality of public services provided to the community, relationship between farmers and wind power enterprises, sustainability of family farming in the community, and mitigation of negative externalities, whether by public authorities or by the company managing the wind farm.

Farmers who live or work near wind farms are more frequently and intensely exposed to visual, noise, and vibrational impacts compared to individuals living farther away (PAULINO et al., 2023). Therefore, the selection of this target group is justified, as understanding how this segment of the population is affected by the externalities generated by these projects is essential for developing effective mitigation strategies.

The identities of the farmers interviewed were anonymized, which encouraged participants to share their perspectives on the wind project more freely. The interviews lasted between twenty and fifty minutes. When authorized by the participant, responses were recorded and later transcribed; if the participant did not feel comfortable with recording, the interviewer wrote down the responses.

Due to the working dynamics of the farmers, it was often difficult to find participants at home. Therefore, a flexible approach was adopted to enable questionnaire application. Part of the interviews was conducted at the headquarters of the Umarizeiro Women Farmers' Association, where farmers frequently gather to discuss community issues. The remaining interviews were carried out at the residences of available participants. This adaptation facilitated data collection and helped overcome logistical limitations encountered during fieldwork.

## RESULTS AND DISCUSSION

A total of thirty questionnaires were administered. During fieldwork, it was often the case that the head of the household was not at home, and his wife, also a farmer, took responsibility for responding to the questionnaire. In other instances, the farmer himself requested that his wife respond on his behalf. This social and family dynamic resulted in 23.3% of respondents being male and 76.7% female. Participant ages ranged from 19 to 82 years. All male respondents reported working in agriculture for more than ten years. Among the female participants, 21.7% had been farming for less than five years, 8.7% for five to ten years, and 69.6% for more than ten years.

Only 10% of respondents reported having leased land to the wind company. Of these, 66.7% leased land for wind turbine installation, while 33.3% signed contracts for the installation of transmission lines.

When asked whether the implementation of the Acauã III Wind Farm had brought positive impacts to the community, about one-third responded affirmatively, citing job creation as the main benefit. This perception is reflected in the statement of Farmer 08 (35 years old): "Yes, the positive impacts are job creation for some residents, as well as economic improvement through the opening of snack bars and restaurants."

However, most respondents stated they did not perceive concrete benefits from the park's installation. Farmer 05 (40 years old) expressed this sentiment by stating: "In my view, no. Because the positives are for them (the wind company). They could have at least informed the population about the problems that would later be caused by the turbines".

This contrast in perceptions shows that, although there was a temporary increase in job



opportunities during the construction phase, the precarious nature of these opportunities limited their recognition as a positive impact. The lack of qualified labor in the community—and in the region in general—meant that the available jobs were mostly low-paying manual labor. Additionally, contracts rarely exceeded five months, contributing to the perception that job creation was temporary, unstable, and insufficient to bring about structural socio-economic changes.

When asked about negative impacts resulting from the wind farm's installation, noise pollution emerged as the most recurrent complaint among respondents. The constant noise from the turbines is widely perceived as a disruption that affects daily life, rest, and overall quality of life.

According to the participants, this situation is exacerbated by the characteristics of the houses in the community, most of which lack ceilings or concrete slabs, intensifying exposure to noise and the turbine lights. Farmer 09 (57 years old) illustrated this by reporting: "The children wake up frightened by the tower's noise". Her testimony indicates that the effects of noise go beyond auditory discomfort, reaching emotional and family dimensions, with more acute impacts on vulnerable groups.

Beyond the effects on people, several farmers reported that the noise from the turbines also affects animal behavior. Specifically, there were accounts of impacts on dairy cattle, which, according to the respondents, show signs of stress and changes in feeding habits. Farmer 04 (75 years old) stated: "The noise produced by the turbines when in operation scares the dairy cows, which affects their feeding and reduces milk production".

Environmental imbalance, associated in the respondents' view with the deforestation caused by the wind farm's implementation, appeared as the second most frequently cited issue, mentioned by more than half of the participants. Respondents linked this process to several noticeable changes in the local environment, such as increased temperatures, altered behavior of local fauna, and reduced agricultural productivity.

This perception is illustrated in the statement of Farmer 27 (35 years old), who said: "I believe nature is the most affected because of the deforestation—it impacted the fauna and increased the number of insects". Farmer 15 (50 years old) added, referring to family farming: "My husband planted beans, fava beans, and corn, and nothing came up; it all failed".

These statements reveal a sensitive understanding of the ecological impacts on daily life in the community, in which vegetation loss is perceived as a triggering factor for imbalances in local ecosystems, undermining agricultural productivity and the historical relationship between residents and their environment.

The link between these phenomena and the presence of the wind farm has not been scientifically proven; they are perceptions formed through the lived experiences of the Umarizeiro farmers over recent years. These accumulated experiences directly influence how residents interpret the environmental and productive changes in their territory. In this context, the majority (76.67%) of respondents stated that the presence of wind farms has undermined agricultural sustainability in the region.

Among the interviewees, a significant portion reported that the roads in the community used by vehicles serving the wind companies have deteriorated considerably in recent years. According to them, maintenance is sporadic and insufficient, both by the companies and by the local government.

In addition to physical deterioration, respondents highlighted the considerable dust produced by the constant traffic of heavy vehicles as a frequent nuisance. During the rainy season, the problem is compounded by the formation of puddles and mud, making mobility difficult, especially for those who use motorcycles, the primary mode of transportation in the area.

This perception is summarized in the statement of Farmer 28 (42 years old): "Dust on the roads, lots of cars passing; in the rainy season there's so much mud, and if you pass by one of their trucks, you get splashed with mud". This account demonstrates how the impacts associated with road infrastructure extend beyond physical wear, directly affecting living conditions and mobility for the local population.

According to Sousa and Carvalho (2023), between 2010 and 2020, the municipality of Lagoa Nova saw a gradual increase in Service Tax (ISSQN) revenue, from R\$167,707.09 in 2010 to R\$1,770,218.32 in 2020. The first time revenue exceeded R\$1 million was in 2014, coinciding with the beginning of wind project installations in the municipality. In the last seven years of the observed period, the average annual revenue surpassed R\$1.4 million.

In this context, farmers were asked whether the municipality had improved public services since the implementation of the wind farms. Their responses reveal a predominantly negative perception of public services in the community, particularly after the wind park's installation. Farmer 07 (78 years old) summed up this view by stating: "There were no improvements in public services provided by the municipal government; even to get medical care you have to travel about six kilometers".

Additionally, some respondents expressed a sense of abandonment by the local government. Farmer 06 (37 years old) articulated this sentiment with the blunt critique: "I didn't see any improvement; we are abandoned by the municipality". The statements reveal not only a stagnation of essential services such as healthcare and infrastructure, but also a general feeling of neglect and institutional invisibility regarding community needs.

Federal Law No. 11.947/2009 mandates that 30% of federal funding transferred to municipalities for school meals must be used to purchase products from family farming. In this regard, respondents were asked about their participation in the National School Feeding Program (PNAE). Only 16.67% of the interviewees supply products to the program and unanimously stated that the presence of wind farms in the region has not affected the production of cakes and cookies, which they provide to the municipality. The remaining 83.3% said they do not participate in the program, either due to lack of interest or unawareness of PNAE's existence.

When asked how they assess the relationship between the wind company and the community's farmers, a significant portion of respondents classified this relationship as negative. "There's no good relationship, and they don't fulfill contracts," said Farmer 02 (54 years old). The main reasons for dissatisfaction include the absence of effective communication channels and the failure of companies to honor contractual terms. Farmer 01 (72 years old) summed up this perception: "The relationship is not good, because the companies don't honor the contracts; they say one thing and then do another. We can no longer access PRONAF because the companies don't authorize it". This restriction—where access to rural credit depends on the authorization of the company that leased the land—constitutes a form of distributive injustice, as it directly affects farmers' productive activities, and also procedural injustice, since many were not adequately informed or included in the decision-making processes leading to this consequence, as discussed by Frate et al. (2019).

Most respondents believe it is possible to improve this relationship and promote a more balanced coexistence between farmers and the wind project established in the community. This view was shared by approximately 90% of participants. Farmer 07 (60 years old) expressed this expectation by stating: "Yes, by improving the roads, communication channels, and honoring contracts". For these respondents, fulfilling established agreements, creating transparent dialogue channels, ensuring proper road maintenance, and mitigating impacts such as excessive turbine noise are essential elements for building a fairer and more respectful relationship.

On the other hand, a smaller portion of respondents (10%) expressed skepticism about any possibility of improving this relationship. For these farmers, their accumulated experience with the enterprise has been marked by frustrations, broken promises, and a lack of tangible returns. This sentiment is captured in the words of Farmer 01 (72 years old): "There's no way, they don't keep their promises". The statement reflects a breakdown in trust, which undermines the legitimacy of the companies' actions and hampers the development of stable community relationships.

In the perception of the vast majority of respondents, even with the significant increase in municipal revenue since the implementation of the wind farm, the resources generated have not been translated into concrete actions to mitigate the negative externalities associated with the project. About 90% of participants reported no noticeable improvement in the quality of life for residents living near the turbines, nor investments in maintaining the roads most used by the community.

This feeling of frustration and neglect is summarized in the statement of Farmer 20 (50 years old): "For me, in my community, there's nothing good—only destruction. They don't try to solve anything. Here in Umarizeiro, we're forgotten; it's a community where everyone fends for themselves, and God looks after us all". The statement reveals a perception of a lack of social and environmental accountability, deepening the disconnect between the project's economic beneficiaries and the local population directly affected by its implementation.

## CONCLUSION

This study analyzed the perceptions of farmers living in the Umarizeiro community, in Lagoa Nova–RN, regarding the externalities associated with the Acauã III Wind Project. The findings reveal that, although the institutional discourse surrounding wind energy projects is anchored in promises of sustainable development, the farmers' everyday experiences point to a set of negative externalities that compromise both social well-being and the sustainability of family farming in the region.

The most frequently reported externalities were: noise pollution, which directly affects residents' daily lives and animal behavior; deforestation, associated with rising temperatures and declining agricultural productivity; and the deterioration of roads and increase in dust, which hinder local mobility. Although not technically quantified, these impacts are clearly expressed in the perceptions of residents and reflect a configuration of distributive injustice, as the costs of energy production are not being offset by equivalent benefits for the community.

From an institutional perspective, there is a widespread perception of neglect by public authorities and a lack of social compensation by the company responsible for the project. For instance, the increase in municipal revenue was not translated into tangible improvements in health services, infrastructure, or support for family farming. The frustration over the absence of prior information about the turbines' impacts was reported by several farmers. This omission reflects a deficit in procedural justice, as it undermines the community's capacity to make informed decisions.

Another important finding concerns access to rural credit through PRONAF. Some farmers reported that, after leasing their land to the wind company, they became dependent on the company's authorization to access financing. This interference with local productive autonomy constitutes a concrete form of territorial injustice, as it restricts access to essential instruments and directly affects the economic stability of farming families.

The relationship between the community and the wind farm is also characterized by distrust and power asymmetry, with reports of broken contracts and the absence of effective communication channels. Nevertheless, most respondents believe that coexistence could be improved if agreements were honored and dialogue channels were opened—highlighting a clear demand for recognition justice.

The research concludes that the implementation of the Acauã III Wind Farm has generated externalities that go beyond environmental impacts and directly affect the socio-economic structure of the community. Although job creation and increased municipal revenue are cited as potential benefits, these were perceived as sporadic, unstable, and insufficient. Thus, the case of Umarizeiro illustrates how energy transition projects, when not guided by principles of territorial justice, can reproduce inequalities, intensify conflicts, and disrupt local economies.

As discussed in the reviewed literature, these findings align with broader trends observed in rural contexts globally impacted by large renewable energy projects. By highlighting the voices and experiences of farmers, this study contributes to the field of critical energy geography, reinforcing the importance of participatory, equitable, and territorially sensitive approaches in energy transition policies.

Regarding the established literature on the impacts of wind energy in Rio Grande do Norte, this study advances the debate by focusing on a rural community in the Potiguar semi-arid region—Umarizeiro, in Lagoa Nova–RN—not previously addressed in earlier surveys. It innovates by incorporating family farmers' perceptions of the day-to-day externalities of the Acauã III Wind Farm, revealing how these affect the productive, environmental, and institutional dimensions of the territory. Among the distinct findings, the restriction on access to structural public policies, such as PRONAF—whose financing became dependent on the leasing company's authorization—stands out. Added to this is the absence of public benefits perceived by the community, despite the increase in municipal revenue.

Based on energy justice, the article provides a critical reading of the promises of modernization and sustainability that support official energy transition discourses. By contrasting these promises with the lived realities of local actors, the study challenges and broadens the analytical frameworks of previous works (Dantas et al., 2019; Frate et al., 2019; Klingler et al., 2024; Pereira et al., 2024; da Silva & Azevedo, 2020; Sobrinho Junior et al., 2021), reaffirming the importance of geographic approaches



that interpret energy as a territorialized practice, shaped by sociopolitical disputes and structural asymmetries.

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