

Article

The Social Impact of CSR in Mexico's Wind Energy Transition

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Abstract

The expansion of wind energy projects in Indigenous territories has intensified debates about the social legitimacy of corporate practices. In the Isthmus of Tehuantepec, Oaxaca, the main wind corridor in Mexico, wind farms coexist with deeply rooted Zapotec governance systems, creating a complex interface between corporate responsibility and community well-being. Based on a survey of 184 workers employed by wind companies in the region, this study examines the relationship between perceived Corporate Social Responsibility (CSR), in its ethical, legal, and philanthropic dimensions, and social and economic well-being. Using partial least squares structural equation modeling (PLS-SEM) and Importance–Performance Map Analysis (IPMA), we found that legal and philanthropic CSR significantly enhance both types of well-being, whereas ethical CSR only affects social well-being. These findings reflect the perspective of workers as hybrid actors, simultaneously employees and members of Zapotec communities, and should be interpreted in light of the study's limitations: its focus on employed individuals, cross-sectional design, and reliance on self-reported perceptions. The results contribute to global debates on symbolic versus substantive CSR, distributive justice, and the risk of “green colonialism” in energy transitions.

Keywords: corporate social responsibility; energy transition; well-being; distributive justice; indigenous peoples

1. Introduction

In the current context of economic globalization, multinational corporations have extended their influence beyond national borders, assuming a growing role in the local development of the regions where they operate. This role transcends mere job creation or economic investment, involving direct interactions with communities, local governments, and ecosystems. In response to this expansion, Corporate Social Responsibility (CSR) emerges as an ethical and strategic framework seeking to align corporate objectives with the well-being of host societies. CSR has evolved from philanthropic practices toward a more structured commitment grounded in ethics, transparency, and respect for human rights, especially in vulnerable or culturally sensitive contexts (Carroll, 1991; Jamali & Karam, 2018).

This transformation is particularly relevant in sectors with high territorial impact, such as energy, where the operation of multinational corporations in rural or indigenous communities demands forms of responsibility that go beyond legal compliance. In these environments, the social legitimacy of projects depends not only on economic profitability



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but also on companies' ability to integrate communities as key stakeholders (Freeman & McVea, 2001), respect their normative systems, and contribute to local human development. However, the literature shows that in emerging countries such as Mexico, CSR implementation remains predominantly charity-based, with limited community participation and inadequate adaptation to the cultural particularities of the social fabric (Sharma, 2019; Rodríguez et al., 2006). This gap between the global sustainability discourse and local practice highlights the need to investigate how CSR is perceived in contexts where foreign capital meets collective forms of life and governance.

An example is the Isthmus of Tehuantepec in the state of Oaxaca, Mexico, which is one of the wind corridors with the greatest global potential, positioning it as a strategic axis in the country's energy transition. The wind industry in Mexico represents a sustainable and viable alternative for energy generation, aligned with climate change mitigation objectives (Martínez-Mendoza et al., 2020). Its renewable nature, economic viability, and low environmental impact make it a strategic option (Aguirre et al., 2022). In particular, the Isthmus of Tehuantepec in Oaxaca is recognized as one of the regions with the greatest wind potential in the world (Juárez-Hernández & León, 2014). Municipalities such as Juchitán de Zaragoza, El Espinal, Unión Hidalgo, and Ixtaltepec have shaped the so-called Wind Corridor of the Isthmus of Tehuantepec, where by 2022, 29 wind farms were already operating across 32,000 hectares, with an installed capacity of 2709 MW generated by 1564 wind turbines (Ávila-Calero & Deniau, 2022).

In the last two decades, multiple national and multinational companies have installed wind farms in this region, presenting their operation as a clean, sustainable alternative aligned with international commitments for climate change mitigation and social responsibility (Martínez-Mendoza et al., 2020; Aguirre et al., 2022). However, this energy transformation has been accompanied by deep social tensions, stemming from the implementation of projects in territories inhabited by indigenous peoples (Zapotec, Huave, Mixe, and Chontal) whose ways of life, collective land tenure systems, and community governance structures are based on principles of autonomy, reciprocity, and respect for the territory as a space for collective life (Jara, 2011).

In this context, wind is not a neutral or merely technical resource but is intimately linked to communal land and local governance systems. As Torres Contreras (2022) points out, in the Isthmus, "who owns the land, owns the wind": a statement reflecting a collective territorial ethic, where the exploitation of natural resources requires social legitimacy, not just administrative permits. The absence of prior, free, and informed consultation processes, a right recognized in International Labor Organization Convention 169 and the Political Constitution of the United Mexican States—coupled with the signing of contracts with third parties not legitimized by community assemblies—has generated legitimacy conflicts, social fragmentation, and even international complaints of human rights violations (Moro, 2021).

Recently, Tornel (2024) has emphasized the need for energy transitions to recognize the diversity of relationships with nature and with development. In the Isthmus, this implies that companies must view communities not as obstacles to progress but as legitimate stakeholders whose participation is essential to project sustainability.

Despite their energy potential and macroeconomic benefits, the operation of wind farms has revealed a significant gap between corporate discourse on social responsibility and stakeholders' perceptions in the territory. Numerous studies document that companies prioritize visible philanthropic actions while neglecting fundamental legal and ethical responsibilities, such as respect for collective governance systems and equitable distribution of benefits (Dunlap, 2018; Ávila-Calero & Deniau, 2022). This disconnect erodes the social legitimacy of projects and undermines the trust necessary for a sustainable relationship between company and community.

Among these stakeholders, locally hired wind energy workers occupy a uniquely revealing position. In the Isthmus of Tehuantepec, they are simultaneously employees of multinational or national wind companies and full members of Zapotec Indigenous communities whose collective governance systems regulate land, resources, and social life. This dual belonging renders them uniquely positioned to evaluate the coherence—or dissonance—between corporate social responsibility (CSR) discourse and its material enactment on the ground. Unlike external observers or distant stakeholders, these workers experience daily the tension between corporate logics and communal worldviews, making their perceptions a sensitive indicator of whether CSR contributes to collective well-being or remains symbolic.

This perspective gains normative weight when situated within binding international frameworks. The International Labor Organization's Convention No. 169 (1989) obliges states and corporations to ensure free, prior, and informed consultation with Indigenous peoples regarding projects affecting their territories, while the [Organisation for Economic Co-operation and Development](#) (2011) require companies to “avoid causing or contributing to adverse impacts on human rights,” including Indigenous rights to lands, territories, and self-determination.

As [Castillejos](#) (2020) observes in the Oaxacan context, CSR initiatives that bypass these obligations, relying instead on charitable gestures without community consent, are widely perceived as legitimizing tactics rather than genuine ethical commitments. Therefore, centering the analysis on locally hired workers not only captures the lived reality of CSR but also provides an empirical basis for assessing whether corporate practices align with the principles of distributive justice, cultural recognition, and procedural legitimacy demanded by both international law and Indigenous communities themselves.

Given this context, and considering that corporate social responsibility (CSR) finds its full meaning when translated into tangible well-being for those directly affected by business operations, the following research question arises:

How is the perception of corporate social responsibility (CSR) in its ethical, legal, and philanthropic dimensions associated with the social and economic well-being perceived by workers of wind companies in the Isthmus of Tehuantepec?

The objective of this study is to analyze the relationship between workers' perception of CSR and their social and economic well-being. The choice of workers as the analysis group reflects their condition as hybrid actors: on the one hand, they are employees subject to companies' internal policies; on the other, they are socially, culturally, and territorially rooted in indigenous communities. Their perception allows evaluation not only of which CSR dimensions are visible on the ground but also of how they translate into perceived well-being. This approach, articulated through Stakeholder Theory ([Freeman, 1984](#)), allows us to move beyond managerial visions of CSR and situate it within a framework of applied business ethics, where shared value creation, procedural justice, and respect for collective rights are conditions for the long-term sustainability of energy projects.

2. Theoretical Framework: Corporate Social Responsibility, Stakeholders, and the Well-Being in the Energy Sector

Corporate Social Responsibility (CSR) has evolved from a charity-based logic toward a strategically and ethically grounded paradigm in which companies pursue not only profitability but also social legitimacy through respect for their stakeholder groups ([Carroll, 1991](#); [Freeman, 1984](#)). In high-impact sectors such as energy, this evolution is particularly relevant: corporate decisions transcend financial considerations and directly affect communities, ecosystems, and social structures. Consequently, CSR can no longer be viewed as an

optional add-on but must be recognized as an essential component of corporate governance and long-term sustainability.

The relationship between multinational corporations and local communities has historically been complex, marked by power asymmetries, cultural differences, and divergent expectations. As [Calvano \(2008\)](#) notes, conflicts arise not only from environmental or economic impacts but also from a lack of mutual recognition and equitable dialog processes. Companies often assume that investment and employment alone legitimize their presence, whereas communities demand respect for their autonomy, participation in decision-making, and a fair distribution of benefits. This mismatch is especially acute in rural or Indigenous contexts, where collective governance systems clash with centralized corporate models. Effective CSR in these settings therefore requires moving beyond philanthropy to address the structural roots of conflict: exclusion, opacity, and the imposition of external agendas.

[Carroll's \(1991\)](#) model remains a key theoretical reference for understanding this comprehensive responsibility. His pyramid, comprising economic, legal, ethical, and philanthropic dimensions, offers a hierarchical structure that, despite criticisms regarding its linearity, enables the identification of escalating levels of social commitment. In this study, we focus on the ethical, legal, and philanthropic dimensions as pillars of a CSR approach that goes beyond minimum compliance. Although environmental responsibility is relevant in the wind energy sector, it is not included in our empirical analysis, as our instrument and research design center on social and institutional dimensions directly experienced by workers.

However, identifying CSR dimensions is insufficient without clarifying to whom these responsibilities are owed. This is where [Freeman's \(1984\)](#) Stakeholder Theory provides an indispensable complement. By defining stakeholders as “any group or individual who can affect or is affected by the achievement of the organization's objectives,” the theory shifts the focus from shareholders to a network of interdependent relationships encompassing employees, local communities, authorities, and the natural environment. This perspective transforms CSR from an abstract moral obligation into a strategic practice of relationship management, wherein legitimacy is built through dialog, transparency, and equity.

The integration of these frameworks enables a more robust analysis: while [Carroll \(1991\)](#) addresses the question “what should the company do?”, [Freeman](#) answers “for whom should it do it?”. In the context of wind energy companies operating in the Isthmus of Tehuantepec, Zapotec workers are not merely external observers but direct stakeholders whose perceptions of corporate practices influence social acceptance, operational stability, and ultimately, project viability. Their dual position, as employees subject to internal policies and as members of Indigenous communities with collective normative systems, makes them uniquely positioned to evaluate whether CSR translates into genuine well-being. This view aligns with contemporary approaches that frame CSR not as unilateral philanthropy but as a process of shared value creation ([Porter & Kramer, 2006](#)), in which benefits for business and society reinforce one another.

Stakeholder theory has evolved significantly since its original formulation. While [Freeman](#) laid the groundwork for recognizing stakeholders as legitimate actors, the recent literature emphasizes that the real challenge lies not in identification but in meaningful engagement. [Kujala et al. \(2022\)](#), in a systematic review, distinguish between instrumental approaches, in which participation serves to mitigate risk, and normative approaches, in which dialog is an end in itself, grounded in respect and justice. In the energy sector, where impacts are prolonged and territorial, the latter is essential for social sustainability. Engagement must extend beyond formal consultations or informational meetings to include continuous processes of listening, feedback, and co-creation that recognize communities as partners, not obstacles or passive beneficiaries.

2.1. CSR and Collective Well-Being

This ethical–strategic approach gains further depth when linked to [Argandoña's \(1998\)](#) concept of the common good. The common good is not the sum of individual interests but the set of social conditions that enable collective human flourishing: justice, security, community cohesion, access to services, and respect for dignity. From this perspective, effective CSR is measured not by the number of programs implemented but by its capacity to improve the quality of life perceived by those affected by corporate operations. Subjective well-being—understood as a personal evaluation of life satisfaction, security, and a sense of community belonging ([Diener, 1984](#))—thus becomes a sensitive and valid indicator of CSR's real-world impact.

The relationship between CSR and community well-being has been documented across development contexts. [Sarmila et al. \(2015\)](#), in a study of extractive projects in Malaysia, show that CSR initiatives focused on job creation, technical training, and local capacity-building yield sustained improvements in perceived economic well-being but only when culturally relevant and co-designed with communities. When projects are imposed externally or limited to one-off donations, their impact is transient. These findings underscore the need for CSR in regions like the Isthmus of Tehuantepec to move beyond charity and integrate with strategies for endogenous economic development.

Empirical evidence supports this link. Recent studies confirm that CSR perception positively influences both employee well-being ([Bocean et al., 2022](#); [Kim et al., 2018](#)) and that of nearby communities ([Zainuddin et al., 2020](#)). Specifically, ethical (fair treatment, living wages), legal (regulatory compliance, respect for agreements), and philanthropic (support for traditions, community infrastructure) dimensions emerge as key predictors of social well-being and perceived security, reinforcing that authentic CSR generates tangible benefits beyond financial performance.

More recently, corporate performance analysis has systematically incorporated Environmental, Social, and Governance (ESG) criteria. [Martiny et al. \(2024\)](#), in a review of over 300 studies, find that high ESG performance stems not only from regulation or investor pressure but also from organizational culture, ethical leadership, and crucially, the quality of relationships with local communities. Companies with strong social performance embed communities into their long-term strategy, treating them not as externalities but as part of relational capital. This reinforces the importance of evaluating CSR not solely through global or corporate metrics, but through the lived perceptions of those in project territories, where the true quality of social commitment is revealed.

Research Hypotheses

Building on this theoretical integration, which combines [Carroll's \(1991\)](#) pyramid of corporate responsibilities, [Freeman's \(1984\)](#) stakeholder perspective, and [Argandoña's \(1998\)](#) collective well-being approach, and drawing on empirical evidence from CSR practices in extractive and energy contexts in Latin America, the following hypotheses are proposed. Recent studies confirm that philanthropic CSR contributes to community well-being when it responds to locally defined, collectively prioritized needs ([Rela et al., 2020](#); [Sarmila et al., 2015](#)). Conversely, the failure to fulfill legal obligations, such as respecting Indigenous normative systems, renders communities “invisible” and erodes both their social and economic well-being ([Mansilla-Obando et al., 2022](#); [Galicía Ramos & de la Vega Navarro, 2023](#)). Furthermore, while ethical responsibility improves individual working conditions, its impact on collective well-being depends on its alignment with territorial and community-based dimensions ([Bocean et al., 2022](#)).

Figure 1 illustrates the conceptual model of the study, representing the theoretical relationships derived from CSR theory and stakeholder theory that guide the formulation of the research hypotheses.

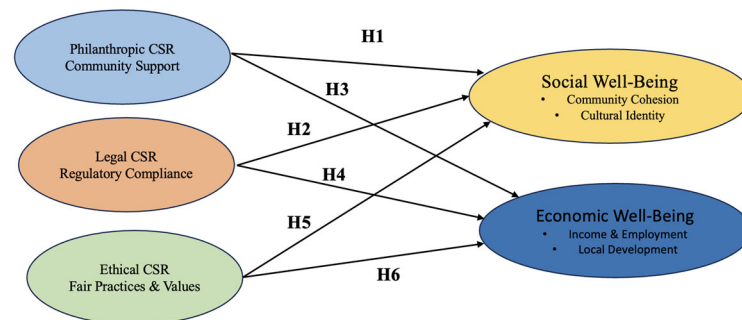


Figure 1. Conceptual model of the relationship between corporate social responsibility and workers' social and economic well-being in the Isthmus of Tehuantepec.

In the Isthmus of Tehuantepec, where workers embody the intersection between corporation and community, these dynamics take on a distinctive character: their perceptions reflect not only the quality of corporate practices but also their capacity to translate into shared benefits. Therefore, the following six hypotheses are proposed:

H1. *Workers' perception of wind companies' philanthropic responsibility is positively associated with perceived social well-being in the Isthmus of Tehuantepec.*

H2. *Workers' perception of legal responsibility is positively associated with perceived social well-being.*

H3. *Workers' perception of philanthropic responsibility is positively associated with perceived economic well-being.*

H4. *Workers' perception of legal responsibility is positively associated with perceived economic well-being.*

H5. *Workers' perception of ethical responsibility is positively associated with perceived social well-being.*

H6. *Workers' perception of ethical responsibility is positively associated with perceived economic well-being.*

3. Materials and Methods

To answer the research question, an exploratory study with a quantitative approach and a cross-sectional temporal dimension was conducted. A sample of 184 people was collected through face-to-face interviews using a structured questionnaire, with data collected via Google Forms. The questionnaire was administered using stratified sampling. For this purpose, the following criteria were considered for the selection of the sample: (1) over 20 years old, (2) employees of wind energy companies, (3) inhabitants of the Isthmus of Tehuantepec, and (4) belonging to the Zapotec indigenous group. This choice is based on understanding the perception of internal stakeholders who are also external with respect to social responsibility; in addition, by residing in this region, they are involved in the social, economic, and political activities of the community with an identity perspective to their indigenous group and are more aware of the company's activities. Furthermore, once the stratum was identified, snowball sampling was used to collect information, given the region's limited access and security, yielding a response rate of 86.38%. Access to them

was only possible through recommendations from community members. Participants' anonymity was maintained, and informed consent was obtained during data collection. This type of sampling may introduce bias; however, the study aimed to collect a sample larger than the minimum to reduce this bias and confirm the sample's representativeness, and a full collinearity test was conducted.

A statistical power analysis was performed using Cohen's tables, as recommended by Benitez et al. (2020), for a Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis. Under this criterion, for three predictors with a medium effect size under an optimistic approximation and a significance level of 0.05, the minimum sample size required for analysis is 77 (Benitez et al., 2020; Nitzl, 2016), which is less than the collected sample size, ensuring its representativeness.

Because cross-sectional studies may introduce bias, it is recommended to assess collinearity to confirm that the variables measure different attributes (Podsakoff et al., 2012). To assess the common method bias, a full collinearity test was performed (Felipe et al., 2017). It evaluated vertical collinearity among the model's predictors during the structural model evaluation, and a lateral collinearity test was conducted by selecting a random variable (Kock & Lynn, 2012; Kock, 2015; Felipe et al., 2017; Leyva-Hernández et al., 2025).

The measurement instrument comprised 31 questions on corporate social responsibility and subjective well-being. Three dimensions of corporate social responsibility, as defined by Avendaño-Rito et al. (2025), were used: ethical, philanthropic, and legal. According to the authors, ethical responsibility was defined as the company's conduct in accordance with social norms; philanthropic responsibility was conceptualized as the company's voluntary activities that reflect society's desires; and legal responsibility was defined as behavior in accordance with government-established practices. Ethical responsibility consisted of 9 items, philanthropic of 6, and legal of 5. A 5-point Likert scale was used for these variables. To measure subjective well-being, the scale proposed by the National Institute of Statistics and Geography (2025) in its Self-Reported Well-being Module (BIARE) was adapted to assess self-perception and life experiences related to quality of life. Subjective well-being comprised social and economic well-being. The former consisted of 6 items, and the latter of 5, both on a 5-point Likert scale. The items used are shown in Table 1.

Table 1. Variable measurements.

Variable		Scale	Author
Ethical responsibility			
ETIC1 *	Provide a safe environment for your employees	1—never to 5—always	Avendaño-Rito et al. (2025)
ETIC2	Train your employees in workplace safety		
ETIC3	Pay fair wages to your employees		
ETIC4 *	Have fair working hours for your employees		
ETIC5	Provide medical services to your employees		
ETIC6	Promote values and good practices among your employees		
ETIC7	Promote values and good practices within the community		
ETIC8	Promote social programs (programs for children, women, and senior citizens)		
ETIC9	Work in conjunction with authorities to create benefits		
Philanthropic responsibility			
FILA1	Provides training courses to the community	1—never to 5—always	Avendaño-Rito et al. (2025)
FILA2	Organize health fairs		
FILA3	Renovate spaces for community use		
FILA4	Implements support programs for vulnerable women and communities		
FILA5	Sponsors sporting events in the community		
FILA6 *	Sponsors cultural events in the community		

Table 1. Cont.

Variable		Scale	Author
Legal responsibility			
LEGA1	The company is legally established in the community.	1—no compliance to 5 full—compliance	Avendaño-Rito et al. (2025)
LEGA2	It pays its taxes on time.		
LEGA3	It respects the property of community residents.		
LEGA4	It respects community authorities.		
LEGA5	It is fair on its payments for land rights for company use (leasing/purchasing).		
Social well-being			
BIES1	Your quality of life	1—strongly disagree to 5—strongly agree	National Institute of Statistics and Geography (2025)
BIES2	The quality of life of your family		
BIES3	The quality of life of your community		
BIES4	Being part of the community		
BIES5 *	Your attitude towards life		
BIES6	Your actions in the community		
Economic well-being			
BIEE1	I receive more income from my work.	1—strongly disagree to 5—strongly agree	National Institute of Statistics and Geography (2025)
BIEE2	I have more job opportunities.		
BIEE3	I have acquired other material goods.		
BIEE4	My community has more job opportunities.		
BIEE5	My community has improved its services (painting, lighting, and road).		

* Item not validated.

For data analysis using PLS-SEM, three stages were followed. In the first stage, the measurement model was evaluated; in the second stage, the structural model and model fit were evaluated; and, in the final stage, an Importance–Performance Map Analysis (IPMA) was performed (J. F. Hair et al., 2019; J. Hair et al., 2023). A pre-evaluation was conducted to confirm the absence of excessive abnormality through skewness and kurtosis. The consistent PLS algorithm, consistent Bootstrapping with 5000 subsamples, and the IPMA algorithm were used, with each dependent variable as the target construct, using SmartPLS version 4 software (Ringle et al., 2022).

Since all constructs have a reflective measurement model, external loadings, construct reliability, and convergent and discriminant validity were evaluated (Benítez et al., 2020). The evaluation of the structural model consisted of determining path coefficients and their significance, as well as variance inflation factor (VIF) values, effect sizes, and the coefficient of determination (J. F. Hair et al., 2017). For the measurement model evaluation, the SRMR (Standardized Root Mean Square Residual) fit index was used (Hu & Bentler, 1998). The criteria proposed by J. Hair et al. (2023) and applied by Leyva-Hernández and Toledo-López (2024) were followed to verify that a measurement scale with a neutral point and the same orientation was used, and that indicator weights were positive; therefore, the analysis proceeded by variable and by indicator.

In turn, importance–performance maps were obtained at the variable level using social and economic well-being indicators. With these maps, it is possible to analyze which variable or indicator allows improving the performance of the dependent variable, considering that the lower right quadrant is where variables/indicators with the greatest potential for performance improvement are located, followed by those in the upper right quadrant, then those in the lower left quadrant, and those located in the upper left quadrant have the lowest improvement potential (J. Hair et al., 2023; Leyva-Hernández & Toledo-López, 2024).

4. Results

Regarding the external factor loadings of the indicators, the criterion of J. F. Hair et al. (2017) was followed: items with loadings between 0.7 and 0.95 were retained, and items ETIC1, ETIC4, FILA6, and BIES5 were discarded. Reliability was confirmed through Cronbach's alpha values, Dijkstra-Henseler's composite reliability (rho_A), and Werts' composite reliability (rho_C) (Ringle et al., 2020). Average variance extracted (AVE) values greater than 0.50, and Heterotrait–Monotrait Ratio (HTMT) values less than 0.85 were considered valid, thus confirming convergent and discriminant validity, respectively (Henseler, 2017; Benitez et al., 2020). Results are shown in Tables 2 and 3.

Table 2. Internal consistency, reliability, and convergent validity.

Latent Variable	Items	Loadings	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Ethical responsibility	ETIC2	0.734	0.917	0.919	0.916	0.609
	ETIC3	0.773				
	ETIC5	0.701				
	ETIC6	0.746				
	ETIC7	0.781				
	ETIC8	0.817				
	ETIC9	0.897				
Philanthropic responsibility	FILA1	0.936	0.930	0.933	0.930	0.726
	FILA2	0.852				
	FILA3	0.847				
	FILA4	0.848				
	FILA5	0.769				
Legal responsibility	LEGA1	0.798	0.927	0.929	0.927	0.719
	LEGA2	0.834				
	LEGA3	0.832				
	LEGA4	0.879				
	LEGA5	0.893				
Social well-being	BIES1	0.878	0.936	0.938	0.936	0.747
	BIES2	0.885				
	BIES3	0.925				
	BIES4	0.786				
	BIES6	0.840				
Economic well-being	BIEE1	0.746	0.902	0.905	0.902	0.650
	BIEE2	0.739				
	BIEE3	0.839				
	BIEE4	0.829				
	BIEE5	0.870				

Table 3. Discriminant analysis (Heterotrait–Monotrait Ratio Matrix).

	Economic Well-Being	Ethical Responsibility	Legal Responsibility	Philanthropic Responsibility
Ethical responsibility	0.628			
Legal responsibility	0.618	0.785		
Philanthropic responsibility	0.708	0.708	0.556	
Social well-being	0.732	0.755	0.716	0.703

To assess common method bias, the vertical and lateral collinearity tests were performed. The VIF values for the structural model were below 5, indicating no multicollinearity among constructs (J. F. Hair et al., 2019). These values are according to the vertical collinearity test, as shown in Table 4. The VIF values for the lateral collinearity test were less than 3, indicating no multicollinearity issues, as shown in Table 5 (Felipe et al., 2017; J. F. Hair et al., 2019). Path coefficients in the model were mostly positive and significant, as shown in Figure 2, except for the relationship between ethical responsibility and economic well-being ($\beta = -0.004$, $p = 0.979$). The largest effect size was observed for the relationship between philanthropic responsibility and economic well-being, with a moderate effect size ($f^2 = 0.324$). Furthermore, according to determination coefficients, ethical, philanthropic, and legal responsibility explain social well-being ($R^2 = 0.662$) more than economic well-being ($R^2 = 0.570$). The obtained SRMR value was 0.061, which is below the 0.08 cutoff (Hu & Bentler, 1998), indicating a good fit.

Table 4. Structural model assessment.

Relationship	β	Mean	Standard Deviation	p	f^2	VIF
Ethical responsibility → Social well-being	0.264	0.264	0.133	0.047	0.057	3.700
Philanthropic responsibility → Social well-being	0.337	0.335	0.079	0.000	0.166	2.060
Legal responsibility → Social well-being	0.322	0.327	0.103	0.002	0.120	2.605
Ethical responsibility → Economic well-being	−0.004	0.002	0.132	0.979	0.00	3.700
Philanthropic responsibility → Economic well-being	0.532	0.530	0.080	0.000	0.324	2.060
Legal responsibility → Economic well-being	0.325	0.322	0.120	0.007	0.096	2.605

β —path coefficient, p — p value, f^2 —effect size, VIF—variance inflation factor.

Table 5. Lateral collinearity test.

Variable	VIF
Ethical responsibility	2.951
Legal responsibility	2.427
Philanthropic responsibility	2.337
Economic well-being	2.200
Social well-being	2.801

VIF—variance inflation factor.

The variables philanthropic and legal responsibility, along with their indicators, are the most important for social and economic well-being, according to Figures 3–6.

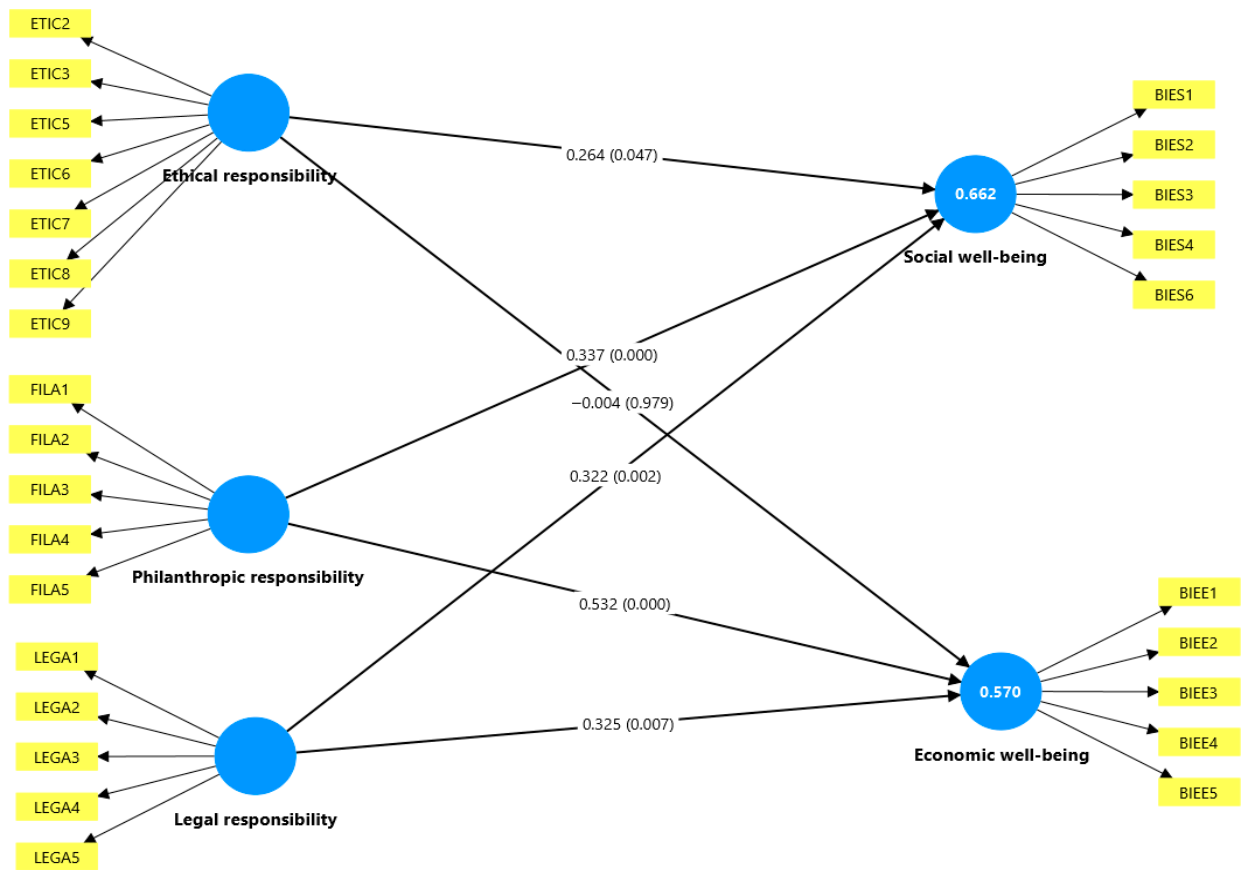


Figure 2. Structural model of well-being.

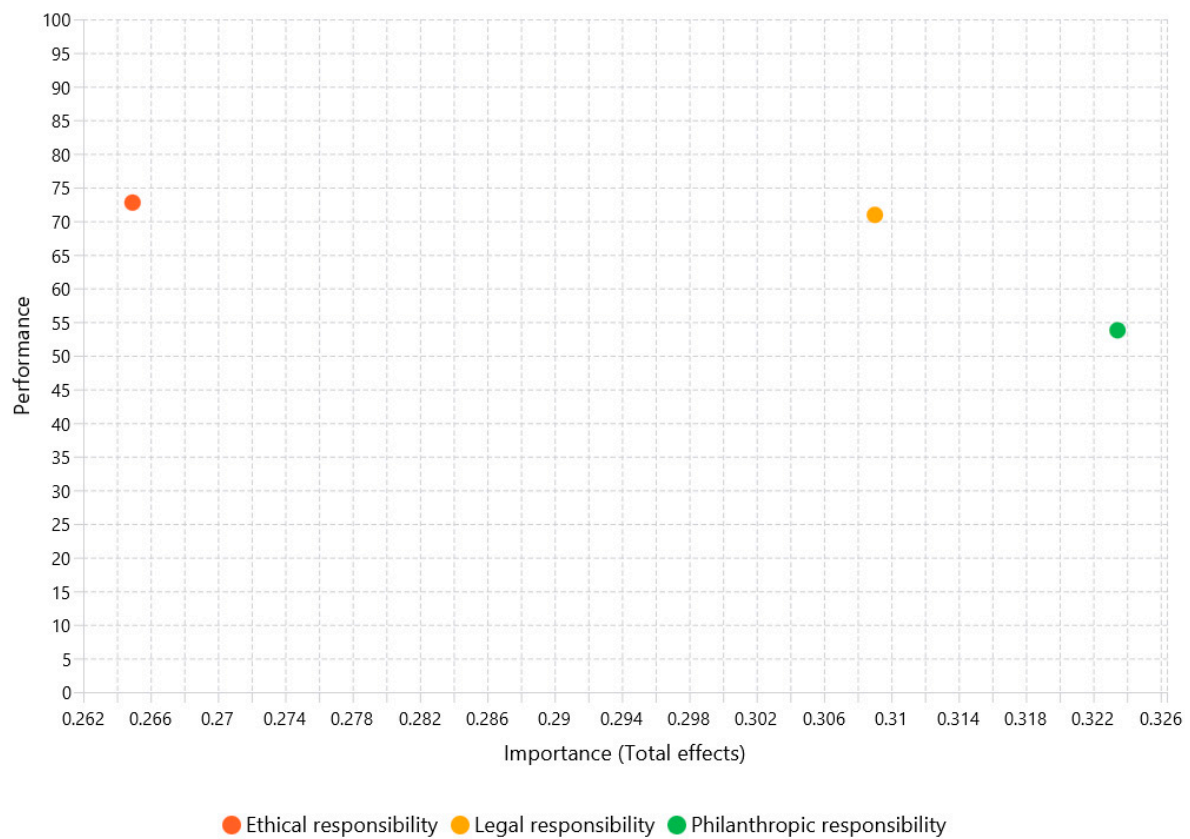


Figure 3. Importance-performance map at the variable level for social well-being.

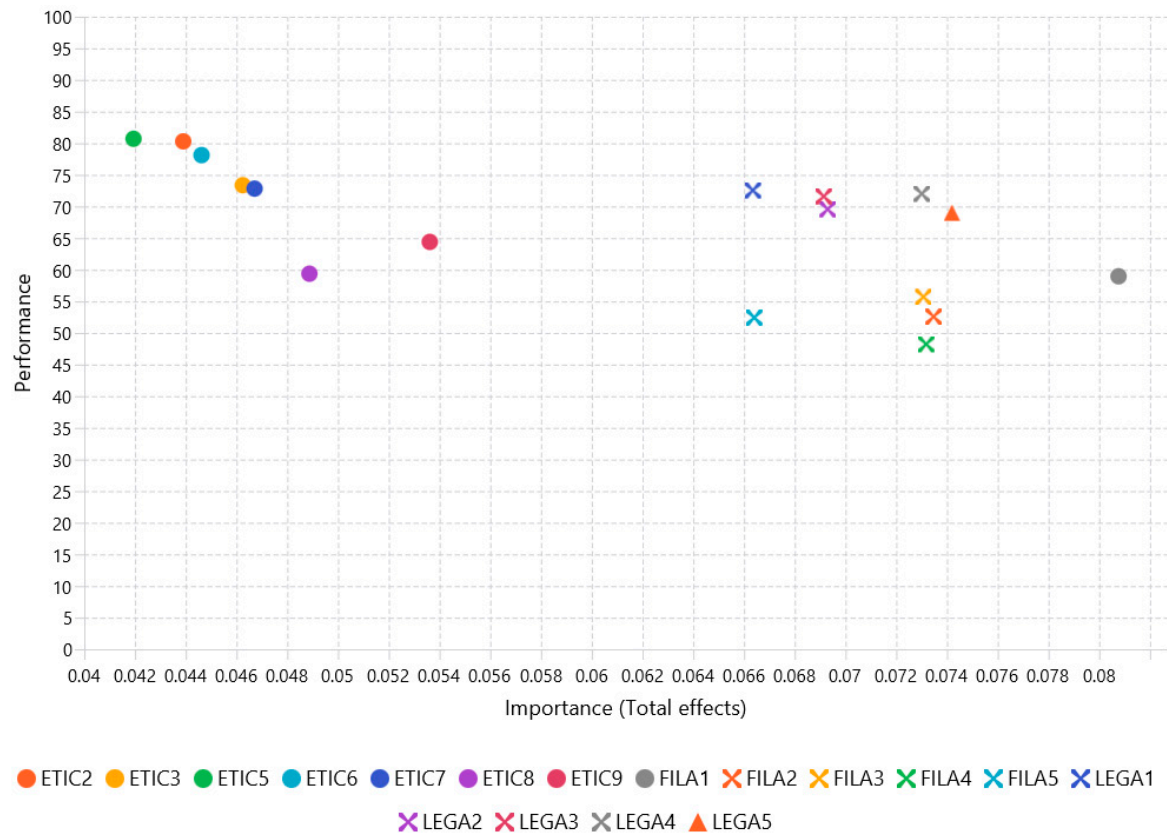


Figure 4. Importance–performance map at the indicator level for social well-being.

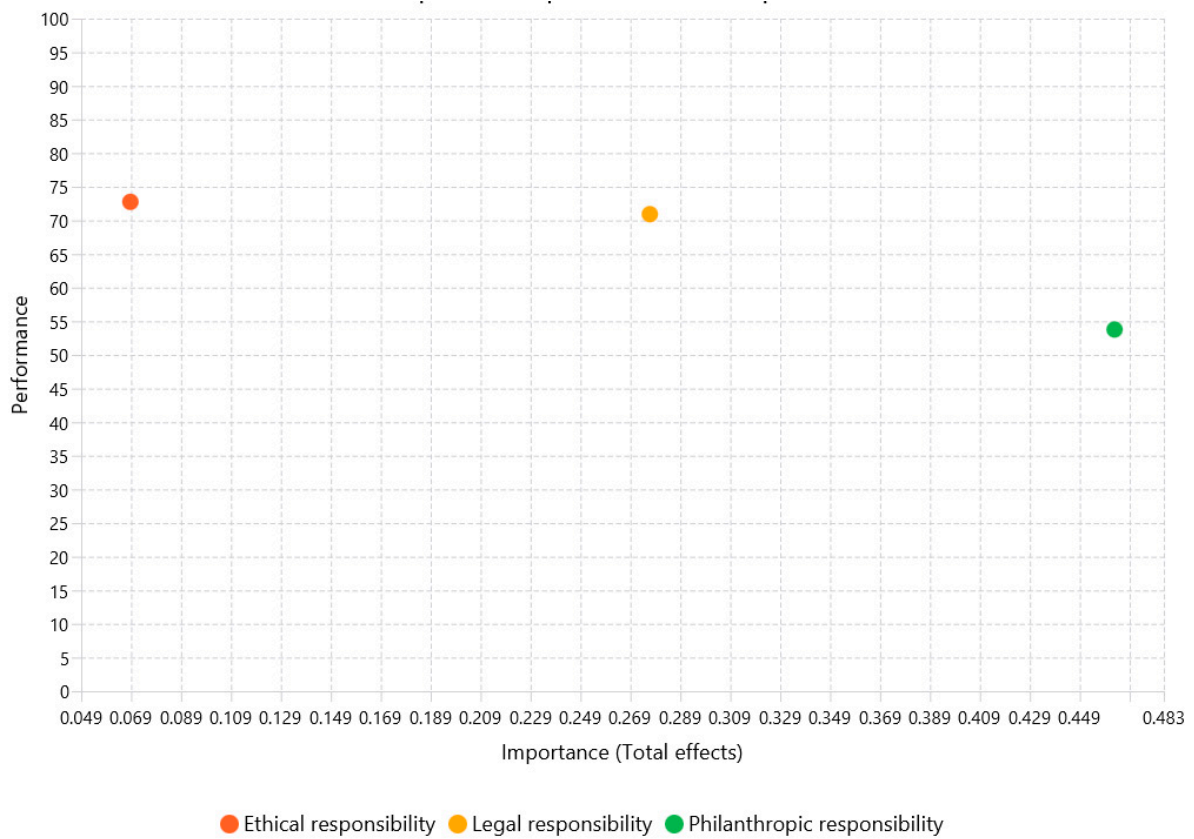


Figure 5. Importance–performance map at the variable level for economic well-being.

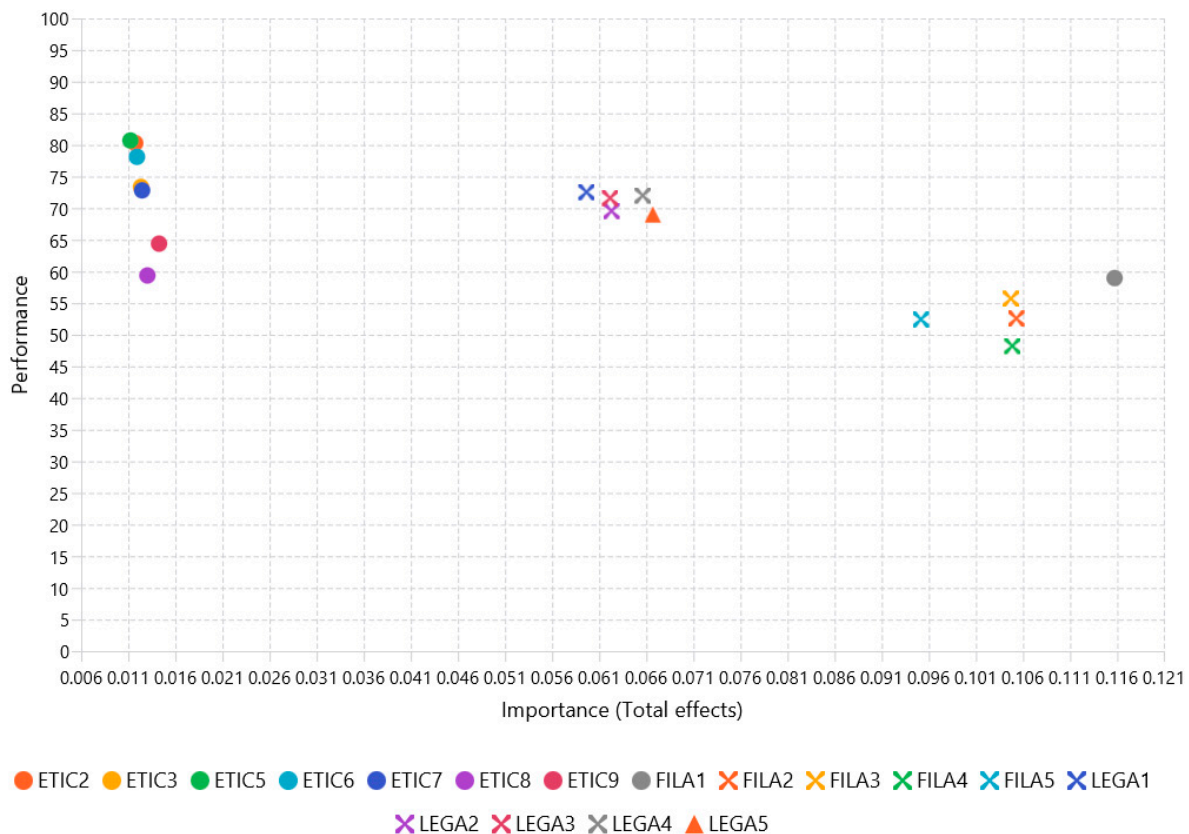


Figure 6. Importance–performance map at the indicator level for economic well-being.

5. Discussion

The findings confirm that Corporate Social Responsibility (CSR) is significantly associated with the well-being perceived by wind energy workers in the Isthmus of Tehuantepec, but with a critical nuance: only the philanthropic and legal dimensions generate tangible social and economic benefits, while the ethical dimension remains confined to internal labor practices and does not translate into collective economic improvements. This pattern both aligns with and challenges key strands of international literature.

On one hand, our results support the widely documented relationship between CSR and well-being in extractive and energy contexts (Bocean et al., 2022; Kim et al., 2018; Zainuddin et al., 2020). However, unlike studies in urban or industrial settings where ethical CSR directly improves individual income, our data reveal a disconnection between internal ethics and collective economic well-being. This finding resonates with critiques of “symbolic CSR” in Indigenous territories (Dunlap, 2018; Long, 2022).

This disconnect is clearly explained by Castillejos (2020), who argues that in Oaxaca, CSR serves primarily as a mechanism of social legitimization rather than a genuine commitment to development. Companies fulfill their obligations toward employees through safety, fair wages, and internal values, but avoid addressing structural issues such as wind rent distribution, prior consultation, or respect for community governance.

As a result, ethical practices are perceived as company-centered rather than community-oriented. This explains why ethical responsibility significantly predicts social well-being (linked to personal dignity and workplace safety) but shows no association with economic well-being ($\beta = -0.004$, $p = 0.979$), which depends on shared benefits such as local employment, infrastructure, and fair land payments.

This is evidenced not only by the structural model results but also through the Importance-Performance Map Analysis (IPMA). As shown in Figure 3, at the construct level,

philanthropic and legal responsibility exhibit the greatest potential to enhance social well-being. At the indicator level, FILA4 (“support programs for vulnerable women and communities”) is the only item located in the first quadrant, while other indicators of philanthropic and legal responsibility fall in the second quadrant, consistent with the construct-level findings. A similar pattern emerges for economic well-being (Figures 5 and 6).

However, we believe these results depend on the context and type of organization in which social responsibility is implemented. Zhu et al. (2016), in a labor research study analyzing ethical aspects of employee work practices, found that these positively affect the financial performance of Chinese state-owned enterprises. Similarly, in Asia, social responsibility moderates sustainable economic development in villages (Purnamawati et al., 2023). Outside the private sector, a relationship between ethics and economics has been observed. Furthermore, in Asia, the effect of social responsibility on financial outcomes is stronger in the long term (Devie et al., 2020). Actions taken to fulfill ethical responsibilities can affect financial well-being, but only in the long term.

In contrast, the strong impact of legal responsibility, particularly fair payments for land (LEGA5) and respect for community authorities (LEGA4), confirms that procedural justice is the cornerstone of legitimacy in Indigenous contexts (Ramirez, 2017; Torres Contreras, 2022). Likewise, the prominence of FILA4 underscores that effective CSR must be culturally relevant and co-designed, rather than imposed from above (Sarmila et al., 2015). This contradicts the logic of shared value creation (Porter & Kramer, 2006), which assumes an automatic alignment between corporate ethics and community benefit. Our findings show that philanthropy alone cannot compensate for the absence of distributive justice and accountability.

These results advance the literature by demonstrating that CSR in Indigenous territories cannot be evaluated using universal corporate metrics. Its legitimacy depends on the recognition of collective rights, equitable benefit-sharing, and genuine dialog with community assemblies principles enshrined in ILO Convention 169 and the OECD Guidelines. When these are absent, even the best-intentioned philanthropy risks being perceived as green colonialism (Dunlap, 2018) rather than sustainability. Therefore, it is essential to respect the community’s worldview, promote dialog to achieve acceptance, and avoid imposing activities that lack local meaning.

6. Conclusions

The findings of this research answer the posed question and confirm that Corporate Social Responsibility (CSR) is significantly associated with the perceived well-being of workers in the Isthmus of Tehuantepec, though with a critical distinction: the philanthropic and legal dimensions drive both social and economic well-being, while the ethical dimension, although relevant to social well-being, does not translate into collective economic improvements. This pattern, corroborated by the importance-performance maps (IPMA), reveals that tangible benefits, such as support for vulnerable groups (FILA4) and respect for communal property and local authorities (LEGA4, LEGA5), carry a decisive weight in perceptions of legitimacy, far outweighing internal codes of conduct.

This result highlights a structural gap: companies implement an internal ethics (labor safety, fair wages, corporate values), but neglect an external ethics that ensures distributive justice and recognition of community normative systems. Consequently, CSR operates as a partial mechanism of legitimation, insufficient to generate shared economic development.

6.1. Theoretical Contribution

This study provides a critical theoretical contribution by integrating Carroll’s (1991) pyramid, Freeman’s (1984) stakeholder theory, and Argandoña’s (1998) common good

approach within an indigenous context. We demonstrate that in collective territories like the Isthmus, CSR cannot be conceived as a voluntary corporate obligation but rather as a politically ethical commitment that must be articulated with local ways of understanding collective well-being. Our findings reinforce the idea that shared value (Porter & Kramer, 2006) emerges only when CSR is anchored in community autonomy, prior consultation, and equitable redistribution of benefits, rather than through charitable donations.

6.2. Limitations of the Study

We recognize that this work has important limitations. First, the reliance on self-reported perceptions may introduce social desirability bias. This limitation was exacerbated by the context of insecurity and socio-political tension in the Isthmus, where several participants refused to answer sensitive questions about fair hours, wages, or labor safety, fearing reprisals or distrusting confidentiality. This reluctance is not a methodological flaw but reflects power asymmetries between company and worker and highlights that certain topics remain “taboo” in economically dependent contexts.

Second, the sample is limited to employees of wind turbine companies, which may not reflect the views of non-employees (e.g., community leaders, small landowners). Third, the cross-sectional design prevents establishing definitive causality; longitudinal studies would be valuable to track how perceptions evolve as projects mature. Fourth, although our instrument captures concrete manifestations of the company–community relationship (e.g., LEGA4, FILA1, ETIC7), it does not measure formal consultation processes or contract transparency, central elements in regional conflicts (Castillejos, 2020; Moro, 2021). Finally, the elimination of items such as ETIC1, ETIC4, FILA6, and BIES5—though statistically justified—suggests that future validations should consider more diverse samples to strengthen the conceptual robustness of the dimensions.

6.3. Recommendations and Future Research Lines

Based on these findings, we propose the following: i. Binding public policies requiring companies to conduct free, prior, and informed consultation processes validated by community assemblies before installing new projects. ii. Energy management models that respect internal normative systems (customs and practices) and ensure that social investment is co-designed with communities. iii. Expanding the analysis to other actors—community leaders, small landowners, family members of workers—to compare perceptions and evaluate potential biases derived from direct employment relationships. iv. Comparative studies between wind farms in the region or in other contexts of energy transition in emerging countries to identify general patterns and local particularities.

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References

- Aguirre, D., Muñoz, O., & Villegas, R. (2022). *La energía eólica, ¿el verdadero Power Mexicano?* [Wind energy, the true Mexican power?]. Instituto de Ecología. Available online: <https://www.inecol.mx> (accessed on 15 December 2025).
- Argandoña, A. (1998). The stakeholder theory and the common good. *Journal of Business Ethics*, 17(10), 1093–1102. [CrossRef]
- Avendaño-Rito, M. D. C., Arango-Ramírez, P. M., Cruz-Cruz, E., & Martínez-Vargas, A. (2025). Desarrollo y validación de una escala para medir la responsabilidad social en empresas eólicas en el Istmo de Tehuantepec [Development and validation of a scale to measure social responsibility in wind energy companies in the Isthmus of Tehuantepec]. *Estudios Sociales: Revista de Alimentación Contemporánea y Desarrollo Regional*, 35(65), e251535.
- Ávila-Calero, S., & Deniau, Y. (2022). *Corredor eólico en el Istmo de Tehuantepec, Oaxaca, México* [Wind corridor in the Isthmus of Tehuantepec, Oaxaca, Mexico]. *EJ Atlas*. Available online: <https://ejatlas.org/conflict/corredor-eolico-en-el-istmo-de-tehuantepec-oaxaca> (accessed on 16 December 2025).
- Benitez, J., Henseler, J., Castillo, A., & Schuberth, F. (2020). How to perform and report an impactful analysis using partial least squares: Guidelines for confirmatory and explanatory IS research. *Information & Management*, 57(2), 103168. [CrossRef]
- Bocean, C. G., Nicolescu, M. M., Cazacu, M., & Dumitriu, S. (2022). The role of social responsibility and ethics in employees' wellbeing. *International Journal of Environmental Research and Public Health*, 19(14), 8838. [CrossRef] [PubMed]
- Calvano, L. (2008). Multinational corporations and local communities: A critical analysis of conflict. *Journal of Business Ethics*, 82(4), 793–805. [CrossRef]
- Carroll, A. B. (1991). The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. *Business Horizons*, 34(4), 39–48. [CrossRef]
- Castillejos, J. G. V. (2020). Responsabilidad social empresarial de las empresas eólicas para el desarrollo sustentable en el Istmo de Tehuantepec, Oaxaca. *Prospectiva Jurídica*, 10(20), 63–90.
- Devie, D., Liman, L. P., Tarigan, J., & Jie, F. (2020). Corporate social responsibility, financial performance and risk in Indonesian natural resources industry. *Social Responsibility Journal*, 16(1), 73–90. [CrossRef]
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95(3), 542–575. [CrossRef]
- Dunlap, A. (2018). The 'solution' is now the 'problem': Wind energy, colonisation and the 'genocide-ecocide nexus' in the Isthmus of Tehuantepec, Oaxaca. *The International Journal of Human Rights*, 22(4), 550–573. [CrossRef]
- Felipe, C. M., Roldán, J. L., & Leal-Rodríguez, A. L. (2017). Impact of organizational culture values on organizational agility. *Sustainability*, 9(12), 2354. [CrossRef]
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.
- Freeman, R. E., & McVea, J. F. (2001). A stakeholder approach to strategic management. In M. A. Hitt, R. E. Freeman, & J. S. Harrison (Eds.), *Handbook of strategic management*. Darden Graduate School of Business Administration. [CrossRef]
- Galicia Ramos, B. M., & de la Vega Navarro, Á. (2023). La participación de las empresas locales en la industria eólica de Oaxaca, México [The participation of local companies in the wind energy industry in Oaxaca, Mexico]. *Región y Sociedad*, 35, e1716. [CrossRef]
- Hair, J., Jr., Hair, J. F., Jr., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2023). *Advanced issues in partial least squares structural equation modeling*. SAGE Publications.
- Hair, J. F., Hult, G. T., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. [CrossRef]
- Henseler, J. (2017). Bridging design and behavioral research with variance-based structural equation modeling. *Journal of Advertising*, 46(1), 178–192. [CrossRef]
- Hu, L. T., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, 3(4), 424–453. [CrossRef]
- Jamali, D., & Karam, C. (2018). Corporate social responsibility in developing countries as an emerging field of study. *International Journal of Management Reviews*, 20(1), 32–61. [CrossRef]
- Jara, R. (2011). Los pueblos del Istmo: Identidad y resistencia [The peoples of the Isthmus: Identity and resistance]. *Revista de Estudios Oaxaqueños*, 12, 45–67.
- Juárez-Hernández, S., & León, G. (2014). Energía eólica en el istmo de Tehuantepec: Desarrollo, actores y oposición social [Wind energy in the Isthmus of Tehuantepec: Development, actors and social opposition]. *Problemas del Desarrollo*, 45(178), 139–162. [CrossRef]

- Kim, H., Woo, E., Uysal, M., & Kwon, N. (2018). The effects of corporate social responsibility (CSR) on employee well-being in the hospitality industry. *International Journal of Contemporary Hospitality Management*, 30(3), 1584–1600. [CrossRef]
- Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (IJEC)*, 11(4), 1–10. [CrossRef]
- Kock, N., & Lynn, G. S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7), 2. [CrossRef]
- Kujala, J., Sachs, S., Leinonen, H., Heikkinen, A., & Laude, D. (2022). Stakeholder engagement: Past, present, and future. *Business & Society*, 61(5), 1136–1196. [CrossRef]
- Leyva-Hernández, S. N., & Toledo-López, A. (2024). Motivators of the intention of wine tourism in Baja California, Mexico. *Foods*, 13(22), 3651. [CrossRef] [PubMed]
- Leyva-Hernández, S. N., Ramos-López, L., Barrera-Perales, O. T., & Camarena-Onofre, J. M. (2025). Experience, price, and loyalty: A comparative analysis of wine and beer in Baja California, Mexico. *Tourism and Hospitality*, 6(4), 195. [CrossRef]
- Long, B. S. (2022). CSR and reconciliation with Indigenous peoples in Canada. *Critical Perspectives on International Business*, 18(1), 15–30. [CrossRef]
- Mansilla-Obando, K., Guinez-Cabrera, N., & Jeldes-Delgado, F. (2022). Cuando la comunidad es invisible: Responsabilidad social empresarial en la industria minera [When the community is invisible: Corporate social responsibility in the mining industry]. *Letras Verdes, Revista Latinoamericana de Estudios Socioambientales*, 31, 77–94. [CrossRef]
- Martiny, A., Taglialatela, J., Testa, F., & Iraldo, F. (2024). Determinants of environmental social and governance (ESG) performance: A systematic literature review. *Journal of Cleaner Production*, 456, 142213. [CrossRef]
- Martínez-Mendoza, E., Rivas-Tovar, L. A., Fernández-Echeverría, E., & Fernández-Lambert, G. (2020). Social impact of wind energy in the Isthmus of Tehuantepec, Mexico, using Likert-fuzzy. *Energy Strategy Reviews*, 32, 100567. [CrossRef]
- Moro, B. (2021). *La comunidad zapoteca rechaza parque eólico de una empresa francesa en Oaxaca* [The Zapotec community rejects the wind farm of a French company in Oaxaca]. Available online: <https://www.france24.com/es/programas/escala-en-par%C3%ADs/20211022-mexico-oaxaca-zapotecas-parque-eolico-medio-ambiente> (accessed on 17 December 2025).
- National Institute of Statistics and Geography. (2025). *Módulo de Bienestar Autoreportado (BIARE Básico)*. Self-Reported Wellbeing Module. Available online: <https://www.inegi.org.mx/programas/biare/> (accessed on 1 September 2025).
- Nitzl, C. (2016). The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development. *Journal of Accounting Literature*, 37(1), 19–35. [CrossRef]
- Organisation for Economic Co-operation and Development. (2011). *OECD guidelines for multinational enterprises*. OECD Publishing. [CrossRef]
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63(1), 539–569. [CrossRef] [PubMed]
- Porter, M. E., & Kramer, M. R. (2006). Strategy & society: The link between competitive advantage and corporate social responsibility. *Harvard Business Review*, 84(12), 78–92.
- Purnamawati, I. G. A., Yuniarta, G. A., & Jie, F. (2023). Strengthening the role of corporate social responsibility in the dimensions of sustainable village economic development. *Heliyon*, 9(4), e15115. [CrossRef]
- Ramirez, J. (2017). Indigenous communities and mega-projects: Corporate social responsibility (CSR) and consultation-consent principles. In *Development-oriented corporate social responsibility: Volume 1* (pp. 79–98). Routledge.
- Rela, I. Z., Ramli, Z., Rusdan, M., Mappasomba, M., & Nikoyan, A. (2020). Conceptual model of corporate social responsibility impact on community well-being. *Entrepreneurship and Sustainability Issues*, 8(2), 311–325. [CrossRef] [PubMed]
- Ringle, C. M., Sarstedt, M., Mitchell, R., & Gudergan, S. P. (2020). Partial least squares structural equation modeling in HRM research. *The International Journal of Human Resource Management*, 31(12), 1617–1643. [CrossRef]
- Ringle, C. M., Wende, S., & Becker, J.-M. (2022). *SmartPLS. 4* [Software]. Available online: <https://www.smartpls.com/> (accessed on 3 November 2025).
- Rodríguez, P., Siegel, D. S., Hillman, A., & Eden, L. (2006). Three lenses on the multinational enterprise: Politics, corruption, and corporate social responsibility. *Journal of International Business Studies*, 37(6), 733–746. [CrossRef]
- Sarmila, M. S., Lyndon, N., Hussain, M. Y., & Awang, A. H. (2015). Local community economic wellbeing through CSR project. *Development*, 58(2–3), 235–242. [CrossRef]
- Sharma, E. (2019). A review of corporate social responsibility in developed and developing nations. *Corporate Social Responsibility and Environmental Management*, 26(4), 712–720. [CrossRef]
- Tornel, C. (2024). Decolonizing the political economy of energy transitions: New energy spaces and pluriversal politics in Mexico. *Review of International Political Economy*, 31(3), 1074–1098. [CrossRef]
- Torres Contreras, G. A. (2022). Twenty-five years under the wind turbines in La Venta, Mexico: Social difference, land control and agrarian change. *The Journal of Peasant Studies*, 49(4), 865–883. [CrossRef]

- Zainuddin, R., Rasyid, R., Sari, D. W., & Rahman, A. (2020). Effect of corporate social responsibility on community resilience: Empirical evidence in the nickel mining industry in Southeast Sulawesi, Indonesia. *Sustainability*, 12(4), 1395. [[CrossRef](#)]
- Zhu, Q., Liu, J., & Lai, K. H. (2016). Corporate social responsibility practices and performance improvement among Chinese national state-owned enterprises. *International Journal of Production Economics*, 171, 417–426. [[CrossRef](#)]

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