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ACCEPTANCE OF LEGAL MINING IN PIURA, PERU FROM THE SHARED VALUE APPROACH: PERCEPTIONS OF UNIVERSITY STUDENTS

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Abstract
This study analyzes the acceptance of legal mining in Piura- Peru from the shared value approach, based on the perceptions of university students residing in areas with mining activity. A structured survey was applied to a sample of 372 students, considering four dimensions: knowledge, institutional trust, environmental perception, and favorable perception of regulated mining. The data were analyzed using descriptive statistics and structural equation modeling (PLS-SEM). The results show that knowledge and environmental perception significantly influence acceptance, whereas institutional trust does not exhibit a relevant effect. These findings reveal that the social legitimacy of mining investments depends both on the availability of information and the perceived environmental commitment. This represents a strategic opportunity to implement initiatives based on shared value. It is concluded that strengthening institutional trust and improving public communication are key challenges to achieving sustainable and socially accepted legal mining in the regional context.

Keywords: legal mining, shared value, environmental perception, institutional trust, regional development

INTRODUCTION

At the global level, mining represents a key driver of economic growth, generating approximately USD 1.3 trillion annually and contributing 8% of GDP in countries that export raw materials (United Nations

Department of Economic and Social Affairs, 2025). In this regard, the United Nations Department of Economic and Social Affairs (2025) warns that over 200 million people live in areas affected by mining activity, with significant environmental and social impacts. While the sector creates 25 million direct jobs worldwide, it also causes forced displacement, depletion of water sources, and deterioration of local ecosystems (United Nations Environment Programme and International Resource Panel, 2023).

From a regional perspective, the World Bank (2022a) reports that in Latin America, mining contributes approximately USD 136 billion annually—equivalent to 4.5% of the region's GDP—and represents more than 50% of exports in countries such as Chile and Peru. However, over 38 million people live in areas of direct influence, where quality of life is shaped by environmental conflicts and territorial disputes (International Energy Agency, 2021). According to the World Bank (2022b), although investments are made in infrastructure and social programs, environmental liabilities and water pollution severely affect public health. This imbalance fuels tensions among government actors, extractive companies, and local communities, which demand a more equitable model of development (World Bank, 2021).

In the Peruvian context, the Ministry of Energy and Mines of Peru (2024) reports that mining generated revenues of USD 41 billion in the past year, representing 60% of national exports and 9% of GDP. However, over 9 million people live in departments with high mining activity, where only 30% have full access to basic services (Economic Commission for Latin America and the Caribbean, 2022). According to the Ministry of the Environment of Peru (2022), while the mining canon finances social projects and infrastructure improvements, there are currently more than 130 active socio-environmental conflicts linked to the sector. The economic development promoted by mining does not always translate into sustainable improvements for the local population or effective environmental protection (Ministry of Energy and Mines of Peru, 2023).

Despite efforts to formalize mining activity in Peru, the Piura region faces a complex scenario regarding legal mining. In areas such as Huancabamba and other mining-influenced zones, regulated operations coexist with ambivalent public perceptions. On one hand, legal mining is recognized for its potential to stimulate local economies and generate formal employment; on the other, concerns persist about transparency, environmental oversight, and equitable distribution of benefits. This situation has led to latent social tensions, expressed through protests, land-use conflicts, and public distrust toward authorities. The gap between mining regulations and their effective implementation, combined with limited institutional communication, has hindered the consolidation of socially accepted mining practices. In this context, it becomes urgent to understand how university students—residents of mining-influenced areas—perceive this reality, as they represent a critical generation capable of influencing public opinion and future social or political decisions related to the extractive model (Defensoría del Pueblo, 2024).

During 2024, the Piura region registered only USD 2 million in legal mining investment, reflecting limited economic activity compared to other regions in the country. The regional project portfolio includes only two formal mining initiatives, indicating low momentum in the development of the legal extractive sector. Despite this situation, Piura accounts for 100% of the country's phosphate production through operations such as Miski Mayo in Bayóvar. However, formal metallic mining—especially gold—has a nearly marginal presence in the region, contributing just 0.05% to national gold production. Most of this activity is carried out by informal or illegal miners, particularly in districts such as Suyo (Ayabaca) and Las Lomas, where recurrent social conflicts, environmental tensions, and governance issues have been reported (Observatorio de Conflictos Mineros en el Perú, 2024). This panorama outlines a critical duality: while legal, non-metallic mining operates with a low profile and limited public visibility, informal mining dominates the local discourse due to its environmental, social, and regulatory impacts. In this context, the application of the shared value approach becomes particularly relevant, as it would allow the alignment of legal mining companies' interests with the sustainable development needs of the territory. Studying the perceptions of university students living in these areas is therefore strategic, as it represents an opportunity to understand how social acceptance of mining is formed, which factors influence it, and how to strengthen the legitimacy of responsible mining investments in an environment marked by distrust, informality, and low institutional capacity.

In this regard, the research question is: What are the factors that influence the acceptance of mining investments among university students in the Piura region of Peru, considering their levels of knowledge about mining, institutional trust, and environmental perception?

The general objective is: To analyze the factors that influence the acceptance of mining investments among university students in the Piura region of Peru, considering their levels of knowledge about mining, institutional trust, and environmental perception.

The specific objectives are: To assess the level of knowledge that university students possess regarding legal mining and its regulation in the Piura region of Peru. To analyze the degree of institutional trust expressed by students toward governmental entities and companies involved in the oversight and operation of legal mining. To examine the environmental perception of university students regarding the ecological behavior and commitment of legal mining activities in Piura, Peru. To determine the relationship between knowledge levels, institutional trust, and environmental perception with the acceptance of mining investments among university students in the region.

The research hypotheses are:
H1: Knowledge about legal mining has a positive and significant effect on the acceptance of mining investments among university students in the Piura region of Peru.
H2: Institutional trust has a positive and significant effect on the acceptance of mining investments among university students in the Piura region of Per.
H3: Environmental perception of legal mining has a positive and significant effect on the acceptance of mining investments among university students in the Piura region of Peru.

THEORETICAL FRAMEWORK

In today's context, where social and environmental challenges demand integrated responses, it is necessary to adopt strategic approaches that reconcile economic growth with collective well-being (Li et al., 2023). In this regard, Gionfriddo and Cuore (2023) explain that the theory of shared value, developed by Michael E. Porter and Mark R. Kramer, emerges as a transformative alternative that redefines the role of business in society. This perspective argues that organizations can and should create economic value while simultaneously generating social value, establishing a mutually beneficial relationship between companies and communities (Hsiao et al., 2021). From this strategic lens, Li et al. (2023) assert that shared value represents an evolution in how competitiveness is understood, positioning the company as an active agent in solving structural problems. Porter and Kramer propose that social challenges should not be seen as externalities but as opportunities for innovation, cost reduction, and access to new markets (Gionfriddo & Cuore, 2023). According to Hsiao et al. (2021), by identifying unmet social needs as potential spaces for innovation, companies transform their processes, products, and partnerships, generating sustainable competitive advantage.
In the context of extractive economic processes, Atienza et al. (2021) highlight that one of the most debated issues is the interaction between mining industries and territorial development. The relationship between mining and regional development entails economic, social, environmental, and political impacts in directly affected areas (Endl et al., 2021). According to Amon et al. (2022), this link depends on the type of mining, the governance model, and the equitable distribution of benefits. Beyond economic indicators, Atienza et al. (2021) argue that this interaction affects social cohesion and territorial sustainability. Mining may generate improvements in education, health, or connectivity, but also leads to socio-environmental conflicts when benefits are distributed asymmetrically (Endl et al., 2021). Amon et al. (2022) propose strategies such as territorial planning, prior consultation, and citizen participation mechanisms to achieve more equitable development.
From an ethical and strategic perspective, Meseguer-Sánchez et al. (2021) explain that sustainability and corporate social responsibility (CSR) approaches imply principles and commitments aimed at maximizing positive contributions and reducing negative impacts. These approaches integrate environmental, social, and governance (ESG) criteria at all stages of the production cycle (Mostepaniuk et al., 2022). Cezarino et al. (2022) emphasize the importance of transparency, respect for human rights, and the generation of shared value in the extractive sector. Meseguer-Sánchez et al. (2021) add that CSR has evolved from philanthropic actions toward models aligned with international standards. Strategic sustainability includes verifiable reporting and commitments aligned with international frameworks such as the UN Global Compact (Mostepaniuk et al., 2022). Cezarino et al. (2022) argue that in mining contexts, this translates into community programs, participatory environmental monitoring, and the strengthening of multi-stakeholder alliances.
Sustainable development in the mining sector is addressed from multiple perspectives and yields diverse outcomes in recent research. Liu et al. (2021) identify both positive and negative impacts in closed mines in Inner Mongolia, highlighting ecological restoration and underground space reuse as key elements for enhancing sustainability and economic value in post-mining areas. Conversely, Mohsin et al. (2021) conclude that coal mining in Sindh, Pakistan, causes significant environmental degradation, particularly in air and water quality and public health, suggesting the urgent need for more sustainable technologies and stricter regulations. Pavolová et al. (2022), in studying the mining sector in selected EU countries, emphasize that the sector's economic contribution is highly variable and dependent on national contexts, highlighting the need for balanced management integrating growth and environmental objectives. In contrast, Pepłowska and Olczak (2024) warn that the European energy transition negatively affects coal mining production in Poland, leading to a notable decrease in GDP and recommending strategic planning and technological innovation to mitigate these adverse effects.
From a social approach, Rey-Martí et al. (2023) apply necessary condition analysis (NCA) to assess community perceptions of mining in Peru, concluding that the adequate provision of education, health, and basic services by mining companies is essential for achieving local environmental satisfaction. Similarly, Teplická et al. (2021) argue that strategic innovation in mining processes—particularly the integration of stationary and mobile equipment—significantly improves operational efficiency and reduces negative environmental impacts in limestone mines in Slovakia. Rybak et al. (2021) present an innovative perspective by proposing the reuse of mining industrial waste in Russia, emphasizing the recovery of valuable metals and the minimization of

environmental risks through advanced pre-treatment activation techniques. Consistent with this, Zhironkin and Szurgacz (2021) state that adopting innovative mining technologies is crucial for cost reduction, improved worker safety, and the management of emerging environmental challenges.

More broadly, Blinova et al. (2022) highlight the importance of integrating circular economy models into corporate sustainability practices in Russian mining, stressing that effective ESG management is essential for truly sustainable development. Zeng et al. (2022), through bibliometric analysis, reveal a significant increase in studies focusing on sustainable tourism in mountainous areas as a viable economic alternative to traditional mining, particularly relevant in regions affected by the COVID-19 pandemic. These investigations demonstrate that while there is broad consensus on the importance of sustainability in the mining sector, significant discrepancies persist regarding specific strategies and actual impacts, underscoring the ongoing need for adaptive and context-sensitive approaches.

Within this framework, the shared value approach is highly relevant to understanding how legal mining can generate both economic and social benefits, provided that there is social legitimacy and perceived environmental responsibility. However, achieving such acceptance depends not only on regulatory compliance but also on how communities understand, evaluate, and engage with mining activities. For this reason, it is essential to analyze the perceptions of university students as critical, informed social actors and potential opinion leaders—especially those residing in mining-affected areas. Their intermediary position between civil society and technocracy makes them a strategic group for observing the opportunities and challenges of shared value in regional extractive contexts such as Piura.

METHODOLOGY

This study adopts a quantitative approach with a non-experimental, correlational, and cross-sectional design. Its purpose was to analyze the factors that influence the acceptance of mining investments in the Piura region of Peru, based on the perceptions of university students from areas with direct mining influence.

POPULATION AND SAMPLE

The target population consisted of 12,466 students enrolled in the 2025-I academic term at the National University of Piura (UNP), Peru. The sample was selected using a non-probabilistic convenience sampling method, based on accessibility, availability, and territorial representativeness. A total of 372 students from the provinces of Huancabamba, Ayabaca, and Tambogrande—areas identified as zones of mining influence—were surveyed. This sample size allowed for a 95% confidence level and an estimated margin of error below 5.5%.

DATA COLLECTION INSTRUMENT

A structured questionnaire was designed and applied, composed of 20 items distributed across four dimensions: knowledge about legal mining (5 items), institutional trust (5 items), environmental perception (5 items), and favorable perception of regulated mining (5 items). The instrument underwent content validation by expert judges and was later evaluated through internal reliability analysis, yielding an overall Cronbach's alpha of 0.926, indicating high internal consistency. The reliability coefficients by dimension were as follows:

- Knowledge: $\alpha = 0.842$
- Trust: $\alpha = 0.864$
- Environmental perception: $\alpha = 0.836$
- Acceptance: $\alpha = 0.898$

The response scale used was a five-point Likert scale ranging from "Strongly disagree" to "Strongly agree."

STATISTICAL ANALYSIS

The data were processed and analyzed in two phases. First, descriptive statistics were used to characterize participant responses. Subsequently, an exploratory factor analysis (EFA) with varimax rotation was conducted to assess item loading onto their respective constructs, with communalities above 0.5 considered acceptable criteria.

In the second phase, a structural equation model (SEM) was implemented using the partial least squares (PLS) method via SmartPLS 4 software. This technique was chosen for its ability to manage moderate sample sizes, complex models, and latent variables. Model fit indicators such as SRMR, d_ULS, d_G, chi-square, and NFI were evaluated to determine the validity of the proposed model. Path coefficients, R^2 values, and empirical support for the stated hypotheses were reported.

ETHICAL CONSIDERATIONS

The study was conducted as part of an academic project involving voluntary, anonymous, and confidential participation from students. Participants were informed in advance about the objectives of the research and the exclusive academic use of the data collected.

RESULTS

SAMPLE CHARACTERISTICS

The sample consisted of 372 university students from the National University of Piura (UNP), Peru, originating from provinces with mining activity in the region: Huancabamba, Ayabaca, and Tambogrande. Most respondents were between 21 and 23 years of age. Students from various academic programs were included, with over 80% of the university's faculties represented.

INSTRUMENT RELIABILITY AND VALIDITY

The questionnaire achieved an overall reliability coefficient of $\alpha = 0.926$, indicating high internal consistency. At the dimensional level, the results were: knowledge ($\alpha = 0.842$), trust ($\alpha = 0.864$), environmental perception ($\alpha = 0.836$), and acceptance ($\alpha = 0.898$).
The exploratory factor analysis showed that most items reached communalities above 0.5, except for item CM5 (0.353), which is considered acceptable in exploratory social studies. These results support the instrument's validity.

TABLE 1. COMMUNALITIES EXTRACTED FROM THE EXPLORATORY FACTOR ANALYSIS

Note: Communality extraction values are presented for each item. Most items show values above 0.5, indicating an adequate representation of the latent variables.

DESCRIPTIVE STATISTICS BY DIMENSION

The results reveal a high level of knowledge among university students regarding legal mining activity in the Piura region of Peru. A total of 74.5% of respondents reported clearly recognizing the differences between legal, informal, and illegal mining, indicating an adequate conceptual understanding. Similarly, 74.1% stated that they are aware that legal mining is governed by a specific regulatory framework and supervised by state entities, while 75.3% affirmed understanding that this activity contributes to the state through tax and royalty payments, demonstrating a basic grasp of its fiscal impact.
An even larger majority, equivalent to 86.0%, acknowledged that legal mining must comply with environmental regulations in order to operate, suggesting a strong association between legality and ecological responsibility in the students' perception. However, a significant gap was identified in terms of institutional knowledge: only 60.2% of students were able to identify the public agencies responsible for monitoring mining in the region, indicating a localized informational weakness concerning institutional actors. In contrast to the previous dimension, students' trust in state entities and business actors linked to the regulation and oversight of legal mining is notably low. Only 28.8% expressed confidence in the government's capacity to effectively supervise mining operations in the region, reflecting a deficit in institutional legitimacy. This trend is echoed in perceptions of companies: only 40.3% of students believe that legal mining companies comply with established environmental standards.
Similarly, only 27.9% of respondents trust the transparency of local authorities in charge of mining oversight. Just 34% perceive that state entities promote responsible mining practices, and 32.2% believe that these institutions adequately inform the population. These results point to a fracture in the relationship between young citizens and the state apparatus, which may directly affect the social license to operate in mining territories. With regard to environmental perception, a moderately positive view of the environmental performance of legal mining was observed. A total of 43.8% of students believe that companies implement adequate measures to protect the environment, while 41.9% perceive that legal mining operations comply with current environmental regulations. Moreover, 52.5% recognize that legal mining makes use of technologies aimed at mitigating negative environmental impacts.
A particularly relevant finding is that 78.5% acknowledge that this type of activity is subject to mandatory environmental compliance, reinforcing the perceived link between legality and sustainability. Finally, 58.3% believe that legal mining contributes effectively to environmental sustainability through the adoption of good practices. However, this also suggests that 40% of students maintain a neutral or critical stance, indicating areas that remain sensitive in terms of public communication and perception. Regarding the acceptance of formal mining operations, the results indicate a generally positive but conditional stance. A total of 71.5% of students expressed support for the continuation of mining projects, provided that strict environmental standards are

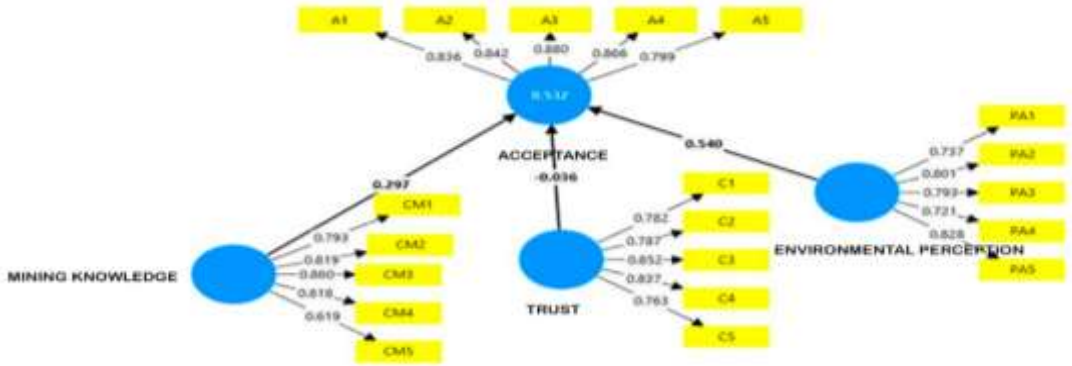
upheld. Likewise, 61.8% believe that mining can be compatible with a sustainable development model in the region.

Furthermore, 73.1% support mining initiatives that generate formal employment in their communities, and 75.6% believe that legal mining can make a positive contribution to regional development. However, this favorable attitude contrasts with a revealing statistic: only 58.9% of respondents stated they would be willing to publicly express their support for legal mining. This suggests the existence of social barriers, possible stigmas, or fears of public exposure, despite their generally positive assessment.

STRUCTURAL MODEL ANALYSIS (SEM)

The structural model was applied using SmartPLS 4. The initial model presented partially acceptable fit indicators; however, after an iterative adjustment process, the values improved significantly:

FIGURE 1. INITIAL STRUCTURAL MODEL



Developed using SmartPLS 4. Note that some fit indices (SRMR = 0.081; NFI = 0.829) do not meet optimal standards, which prompted the subsequent adjustment of the model.

TABLE 2. FIT INDICATORS – INITIAL MODEL

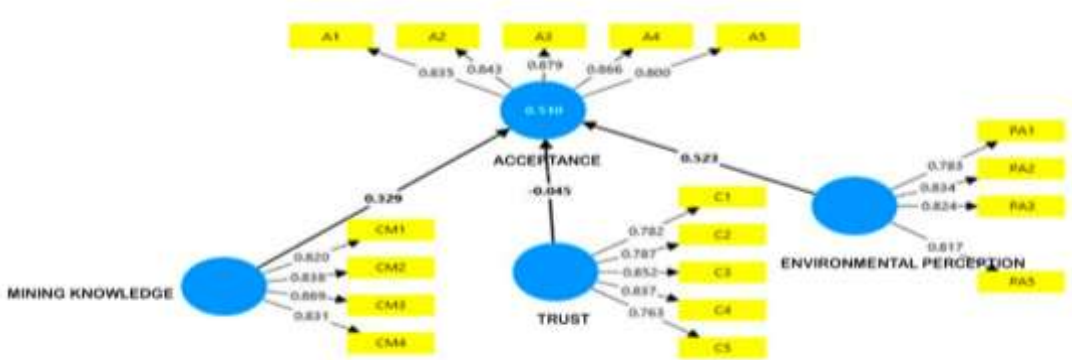
	Saturated model	Estimated model
SRMR	0.081	0.081
d_ULS	1.369	1.369
d_G	0.375	0.375
Chi-square	759.769	759.769
NFI	0.829	0.829

Developed by the research team

Primarily, SRMR 0.081 and NFI 0.829 do not meet the expected thresholds.

SRMR = 0.081; NFI = 0.829 (below the 0.90 threshold).

FIGURE 2. FINAL ADJUSTED STRUCTURAL MODEL



The path coefficients show significant relationships between environmental perception and acceptance (β = 0.523), and between knowledge and acceptance (β = 0.329). The SRMR index improved to 0.072, and the NFI reached 0.847, both within acceptable ranges for exploratory studies.

TABLE 3. FIT INDICATORS – FINAL ADJUSTED MODEL

	Saturated model	Estimated model
SRMR	0.072	0.072
d_ULS	0.886	0.886
d_G	0.307	0.307
Chi-square	623.120	623.120
NFI	0.847	0.847

These values reflect a substantial improvement compared to the initial model. Although the NFI does not exceed the 0.90 threshold, it falls within the acceptable range for exploratory and correlational models, especially considering that other indicators (such as SRMR) meet international standards (SRMR < 0.08). **SRMR = 0.072; NFI = 0.847** (considered acceptable in exploratory studies).
The coefficient of determination (R^2) for the variable "acceptance" was **0.510**, indicating that **51% of the variability** in mining acceptance is explained by knowledge, trust, and environmental perception.
The results of the structural model allow for the evaluation of the following hypotheses:
• **H1: Knowledge → Acceptance**
Coefficient = 0.329 → Hypothesis confirmed (positive and significant relationship).
• **H2: Trust → Acceptance**
Coefficient = -0.045 → Hypothesis not confirmed (negative and non-significant relationship).
• **H3: Environmental perception → Acceptance**
Coefficient = 0.523 → Hypothesis confirmed (positive and significant relationship).

DISCUSSION

The results obtained in this study allow for the interpretation of the acceptance of legal mining investments in Piura, Peru not merely as a matter of student opinion, but as a reflection of the tensions and opportunities posed by the shared value approach in extractive contexts. In light of the theoretical framework, it is evident that knowledge, institutional trust, and environmental perception function as interdependent dimensions that shape the degree of social legitimacy toward mining activity.
First, the high level of knowledge about legal mining (confirmed by a positive coefficient of 0.329 in the structural model) supports the assertions of Li et al. (2023), who argue that the generation of shared value begins with mutual recognition among stakeholders. The students' understanding of mining's legal, fiscal, and environmental frameworks constitutes a foundation upon which a culture of company–community cooperation can be built—an essential condition for long-term sustainability. In this sense, knowledge acts as a facilitator of shared value, enabling the identification of real benefits and development opportunities.
However, the low level of institutional trust (coefficient = –0.045, hypothesis not confirmed) reveals a structural challenge in achieving such shared value. According to Martínez-Alier (2002), distrust in the state and local authorities can lead to socio-environmental conflicts, even when extractive activities are legal. This finding aligns with the World Bank's (2021) concerns about institutional liabilities in mining territories across Latin America. The lack of transparency, perceived inefficiency, and limited official communication erode the legitimacy of investments, thereby threatening territorial sustainability. In contrast, environmental perception shows a significant influence on acceptance (coefficient = 0.523), which is consistent with studies by Rey-Martí et al. (2023) and Endl et al. (2021), who emphasize that perceived compliance with environmental standards strengthens social acceptance. Indeed, students acknowledge the implementation of mitigation technologies, adherence to regulations, and environmentally responsible practices, even though some skepticism remains. This finding illustrates that shared value is not generated by economic benefits alone, but also through visible and verifiable environmental commitment, in line with the perspective of Meseguer-Sánchez et al. (2021).
The results confirm that the perception of environmental compliance is a key factor that strengthens the social legitimacy of legal mining, demonstrating that students positively associate legality with sustainable practices. This finding highlights that social acceptance is not solely derived from economic benefits, but also from visible and verifiable environmental commitments made by mining companies. These perceptions are consistent with the theoretical contributions of Meseguer-Sánchez et al. (2021), who emphasize the relevance of demonstrated sustainability for building shared value and trust with communities. Taken together, the model explains 51% of the variability in mining acceptance based on the three factors analyzed, confirming that acceptance is a multidimensional phenomenon. As noted by Gionfriddo and Cuore Piccaluga (2023), shared

value materializes when companies successfully align their economic interests with social expectations. From this perspective, the level of acceptance observed among students represents an opportunity to consolidate a mining model grounded in shared value, provided that channels of trust, citizen participation, and institutional transparency are strengthened.

Nonetheless, it is important to address a complementary finding: only 58.9% of students indicated willingness to publicly express support for legal mining, suggesting the existence of symbolic or social barriers that limit public license. According to Entman (1993), institutional and media framing directly influence the public expression of opinions. This reveals that even when legal mining is functionally accepted, a social stigma persists that could hinder collaborative initiatives.

In sum, the findings of this study provide empirical evidence to understand how subjective elements (perceptions, trust, knowledge) relate to the principles of shared value, and how these, in turn, influence real opportunities for regional development. Local authorities, universities, and mining companies play a critical role in translating this latent acceptance into strategic alliances, participatory programs, and joint monitoring mechanisms, so that legal mining in Piura, Peru can evolve toward a model of governance that is more inclusive, resilient, and territorially just.

CONCLUSIONS

This study analyzed the factors that influence the acceptance of legal mining in Piura- Peru, from the shared value approach, using the perceptions of university students as a reference. The findings show that knowledge about legal mining and environmental perception positively influence the acceptance of this activity, while institutional trust did not show a statistically significant effect. This result suggests that, although there is a favorable disposition toward regulated mining, limitations persist in the credibility of the state and local entities responsible for its oversight. In particular, the high level of knowledge about the regulation, impacts, and fiscal benefits of legal mining among students represents a favorable foundation for promoting collaborative relationships under the shared value approach. Likewise, the perception of environmental compliance by companies reinforces the legitimacy of extractive operations, positioning it as a key factor for strengthening social acceptance. However, the low level of trust in institutions reflects a structural challenge that must be addressed through policies of transparency, effective oversight, and citizen participation. Although most respondents expressed a favorable attitude toward responsible mining projects, just over half were willing to publicly support them. This reveals the existence of symbolic, social, or informational barriers that limit the open expression of public support, which could undermine the progress of strategies based on shared value. Overall, the results suggest that the path toward legitimized legal mining in Piura, Peru, depends not only on its legal formalization or economic performance but also on its capacity to build trust, demonstrate environmental commitment, and generate tangible benefits for communities, in alignment with the principles of shared value.

This study presents some important limitations. First, the sample consisted only of university students from a public university in Piura, which limits the generalizability of the findings to other social groups or regions. Additionally, the cross-sectional design prevents the establishment of causal relationships between the variables analyzed. Finally, the exclusive use of a quantitative methodology limited a deeper exploration of the meanings and motivations behind student perceptions.

It is recommended that future research expand the sample to include other social actors linked to mining activity, such as local communities or public officials. It would also be valuable to apply mixed methodologies that combine quantitative and qualitative techniques, which would allow for a better understanding of perceptions, tensions, and opportunities surrounding legal mining from the shared value approach. Comparative studies in other mining regions of the country are also suggested to contrast territorial dynamics and validate the findings in diverse contexts.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in the conduct and publication of this study.

DECLARATION ON THE USE OF ARTIFICIAL INTELLIGENCE

Artificial intelligence was used in an assisted manner to support the drafting, grammatical revision, and structuring of the manuscript, under the academic supervision and judgment of the authors.

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