



MSMEs Go Green Pays Less: Efficiency Strategies to Minimize the Impact of Carbon Tax

Maryati Kadir Thalib¹, Afriana Lomagio², Nur Lazimatul Hilma Sholehah³

^{1,2,3}Universitas Ichsan Gorontalo Utara/Desa Moluo, Kecamatan Kwandang, Kabupaten Gorontalo Utara/Indonesia

Email: ichythalib15@gmail.com¹, afriana.lomagio2@gmail.com², nurlazimatul72@gmail.com³

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Abstract. *This study examines the understanding, perceptions, readiness, and adaptation strategies of Micro, Small, and Medium Enterprises (MSMEs) in Gorontalo, Indonesia, toward carbon tax policies. MSMEs remain highly dependent on fossil-based energy, while their knowledge and capacity to adapt to environmental fiscal instruments are still limited. This study employed a descriptive qualitative approach using in-depth interviews with purposively selected food-sector MSMEs, supported by policy documents, official reports, and relevant literature. Data were analyzed through thematic analysis focusing on understanding, readiness, perceptions, challenges, and adaptation strategies. The findings indicate that most MSMEs have limited knowledge of carbon tax mechanisms and generally perceive the policy as an additional financial burden. Although negative perceptions and uncertainty are common, some business actors emphasize the importance of fairness and transparency in policy implementation. Only a small proportion of MSMEs demonstrate readiness to adapt when supported by government incentives, green technologies, and technical assistance. Key challenges include limited technical knowledge, financial constraints, restricted access to environmentally friendly technology, and regulatory complexity. Existing adaptation efforts are mainly limited to energy-saving practices and reducing plastic packaging. The study concludes that successful carbon tax implementation among MSMEs requires inclusive government support to facilitate a fair and sustainable transition toward a green economy.*

Abstrak. Penelitian ini mengkaji tingkat pemahaman, persepsi, kesiapan, dan strategi adaptasi Usaha Mikro, Kecil, dan Menengah (UMKM) di Gorontalo terhadap kebijakan pajak karbon. UMKM masih sangat bergantung pada energi berbasis fosil, sementara pengetahuan dan kapasitas adaptasi terhadap instrumen fiskal lingkungan masih terbatas. Penelitian ini menggunakan pendekatan kualitatif deskriptif melalui wawancara mendalam terhadap pelaku UMKM sektor makanan yang dipilih secara purposif, didukung oleh dokumen

kebijakan, laporan resmi, dan literatur terkait. Data dianalisis menggunakan analisis tematik dengan fokus pada pemahaman, kesiapan, persepsi, tantangan, dan strategi adaptasi. Hasil penelitian menunjukkan bahwa sebagian besar UMKM memiliki pemahaman yang rendah mengenai mekanisme pajak karbon dan cenderung memandangnya sebagai beban finansial tambahan. Meskipun persepsi yang muncul umumnya negatif dan disertai ketidakpastian, sebagian pelaku usaha menekankan pentingnya keadilan dan transparansi dalam implementasi kebijakan. Hanya sebagian kecil UMKM yang siap beradaptasi apabila didukung oleh insentif pemerintah, teknologi hijau, dan bantuan teknis. Tantangan utama meliputi keterbatasan pengetahuan teknis, kendala keuangan, minimnya akses terhadap teknologi ramah lingkungan, serta kompleksitas regulasi. Upaya adaptasi yang dilakukan masih terbatas pada efisiensi energi dan pengurangan penggunaan kemasan plastik. Penelitian ini menyimpulkan bahwa keberhasilan implementasi pajak karbon pada UMKM sangat bergantung pada dukungan pemerintah yang inklusif guna mewujudkan transisi yang adil dan berkelanjutan menuju ekonomi hijau.

Keywords:

*Carbon Tax; MSMEs;
Green Economy*

Corresponding author:

Email: nurlazimatul72@gmail.com

Introduction

The carbon tax is a fiscal policy instrument used globally to reduce greenhouse gas emissions and encourage the transition to a green economy (Harfiani, 2025). Since 2022, Indonesia, through the Law on Harmonization of Tax Regulations (HPP Law), has begun to gradually implement a carbon tax, with an initial target on the fossil energy-based industrial sector. However, the direction of the national decarbonization policy will extend the implications of the carbon tax to various sectors, including Micro, Small, and Medium Enterprises (MSMEs) (Rahman et al., 2024). MSMEs have a strategic position in the Indonesian economy. According to data from the Ministry of Cooperatives and SMEs in 2023, MSMEs contribute 61.97% to the Gross Domestic Product (GDP) and employ 97% of the national workforce. In Gorontalo Province, MSMEs are the backbone of the regional economy with more than 60,000 business units, the majority of which are engaged in trade, processing agricultural products, and household industries. However, limited access to green technology and low energy efficiency make MSMEs vulnerable to facing additional burdens from the implementation of carbon taxes. More than 65% of MSMEs in Gorontalo still rely on fossil fuels. In comparison, around 72% of business actors have not adequately understood the policy's impact and the incentive opportunities available.

This phenomenon poses new problems. On the one hand, MSMEs are required to maintain business sustainability; on the other hand, they face potential increases in operational costs due to carbon taxes. (Widayati, 2025). Some previous studies on the carbon tax tended to focus on large industrial and manufacturing sectors, so studies on MSMEs were relatively limited. Thus, there is a research gap in understanding how MSMEs, especially in areas with limited adaptation capacity, can respond to this policy. This research is important because MSMEs play a strategic role in regional economic development and are highly vulnerable to policy changes that may increase operational costs. Limited fiscal literacy, low awareness of environmental issues, and restricted access to green technology may hinder MSMEs

in adapting to carbon tax policies. Without adequate preparation, the implementation of carbon taxes could potentially reduce the competitiveness and sustainability of MSMEs, particularly in regions with limited economic and technological resources such as Gorontalo.

In that framework, the concept of MSMEs Go Green Pays Less offers a solution perspective. This principle emphasizes that environmentally friendly business practices not only contribute to reducing carbon emissions but also help lower operational costs and potential fiscal burdens through energy efficiency and resource optimization. Therefore, understanding the readiness and adaptation capacity of MSMEs is essential to support a fair and sustainable transition toward a low-carbon economy.

The novelty of this study lies in its focus on MSMEs in Gorontalo City and its qualitative exploration of MSMEs' understanding, perceptions, readiness, challenges, and adaptation strategies regarding carbon tax implementation. Unlike previous studies that primarily examined the impact of carbon taxes on large industries and manufacturing sectors, this study provides empirical evidence from the MSME perspective and highlights the relevance of the MSMEs Go Green Pays Less approach as a strategy for reducing the potential burden of carbon tax policies. Based on this context, this study aims to analyze the impact of implementing a carbon tax on MSMEs in Gorontalo and identify feasible energy-efficiency strategies. The results of this research are expected to enrich the literature on carbon tax policies and MSMEs while providing practical recommendations for business actors and local governments in supporting the transition toward a low-emission economy.

Research Method

This study employed a qualitative research approach using a descriptive design. The descriptive qualitative approach was selected because it enables researchers to explore and understand in depth the perceptions, readiness, experiences, and adaptation strategies of MSMEs regarding the implementation of carbon tax policies (Sulistiyo, 2023). This approach is considered appropriate because the issue of carbon tax among MSMEs is closely related to subjective understanding, attitudes, and experiences that cannot be adequately explained through quantitative measurement alone.

The research was conducted on MSMEs in the food sector located in Gorontalo City. The food sector was selected because its production activities are relatively dependent on energy consumption, such as electricity, LPG, and fuel, making it potentially affected by carbon tax policies. Informants were selected using purposive sampling techniques based on several criteria: (1) MSMEs that have operated for at least two years, (2) actively conduct production activities, and (3) utilize carbon-based energy sources in their business operations. These criteria were established to ensure that participants could provide relevant and information-rich insights regarding the implementation of carbon tax policies (Creswell & Poth, 2018).

Data collection was carried out through in-depth interviews and documentation. In-depth interviews were conducted directly with MSME owners or managers to obtain information regarding their understanding, perceptions, readiness, challenges, and adaptation strategies related to carbon tax policies. Documentation techniques were used to collect supporting secondary data from government reports, policy documents, official publications, and relevant academic literature.

The data analysis technique used in this study was thematic analysis. The analysis process consisted of several stages: (1) data reduction through interview transcription and data selection, (2) coding of important statements obtained from informants, (3) categorization of codes into major themes, including understanding

of carbon tax policies, readiness, policy perceptions, challenges, and adaptation strategies, (4) interpretation of findings by comparing empirical data with relevant theories and previous studies, and (5) drawing conclusions and formulating recommendations. Thematic analysis was chosen because it facilitates the identification of recurring patterns and themes emerging from participants' experiences and perspectives. To enhance the credibility of the findings, data triangulation was conducted by comparing information obtained from interviews with secondary documents and relevant literature. This process helped ensure the consistency and validity of the research findings. Through this approach, the study not only describes the factual conditions of MSMEs but also provides a deeper understanding of how MSMEs perceive and respond to carbon tax policies, as well as the challenges and opportunities they face in transitioning toward sustainable business practices.

Results and Discussion

The Level of Understanding and Readiness of MSMEs to Carbon Tax Policy

Based on interviews with MSME actors in the food sector in Gorontalo City, it is evident that their understanding of the carbon tax policy remains low and highly diverse. The majority of MSMEs lack adequate information about the policy's mechanisms and implications; in fact, most know the term only from the media. This condition reflects weak policy socialization at the local level, so that the issue of a carbon tax is not understood as part of a fiscal obligation that could affect the sustainability of their business.

Some MSMEs consider this policy irrelevant to their small business scale because they feel their energy use is insignificant. However, business actors with larger production scales are starting to show concern, especially about the potential increase in operational costs due to the carbon tax. However, a small number of MSME actors also express readiness to adapt if the government provides support in the form of incentives, energy-saving technology, or technical training.

In general, these findings show that MSMEs' readiness remains low, but there is latent readiness, as evidenced by openness to adapt when supported by inclusive policies.

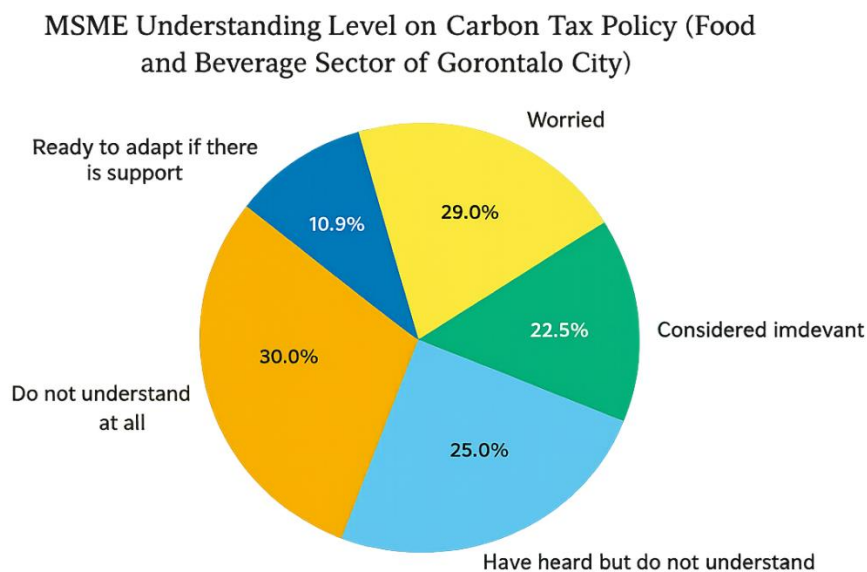


Figure 1. MSME Understanding Level on Carbon Tax Policy

Table 1. Summary of Qualitative Findings

Category Understanding/Readiness	Percentage (Estimate)	Clue
Don't understand at all	30%	"There has never been an official socialization, so if I ask you for details, I don't understand at all."
I've heard it, but don't understand it.	25%	"I only know that the carbon tax is related to pollution, but there has never been a detailed explanation."
Consider irrelevant	15%	"My business only uses gas stoves and home electricity; it feels far away if it is associated with a carbon tax."
Understand the basics of the issue, but worry about the cost	20%	"We use a lot of gas and electricity; if it is counted as emissions and then taxed, it is obviously heavy."
Ready to adapt if support is available	10%	"If there is energy-saving technology that the government assists, I can actually be encouraged to implement it."

Source: Processed Data 2025

The combination of the diagram and table above shows that more than half of MSMEs (55%) are in the category of not understanding the carbon tax policy or having only heard of it, without understanding the details. As many as 15% still consider this policy irrelevant, so they may reject it if implemented. Meanwhile, another 30% (20% worried, 10% ready to adapt) began to show awareness of the policy's potential impact.

These findings confirm that the level of fiscal literacy and technical readiness among MSMEs remains low, so the implementation of the carbon tax risks resistance if it is not accompanied by socialization, technical assistance, and clear incentives. In other words, the readiness of MSMEs depends more on the government's role as a transition facilitator than on the internal capacity of business actors.

Policy Perception and Government Support in the Implementation of Carbon Tax

The results of interviews with MSMEs in the food sector in Gorontalo City indicate that the carbon tax policy is perceived as a mix of worry, confusion, and hope. Most MSME actors consider this policy still far from their reality because, at the time of the research, there had never been any direct socialization from the government. This makes them view the carbon tax as merely a new fiscal burden with no clear benefits for small businesses.

The absence of socialization and technical guidance creates the perception that the policy is implemented in a top-down manner without adequately considering the conditions and capacities of MSMEs. Many informants emphasized the importance of fairness in implementation, as they were concerned that MSMEs would face additional financial pressure while larger industries possess greater resources to absorb compliance costs or transfer them to consumers. This concern is strengthened by the fact that many MSMEs operate with limited profit margins, making them more vulnerable to additional tax burdens.

Although the dominant perception tends to be negative, several respondents expressed a more optimistic view. They considered the carbon tax acceptable if it is accompanied by tangible government support, such as energy subsidies, assistance in adopting energy-efficient technologies, access to green financing, and fiscal incentives for environmentally friendly business practices. Some business owners also believed that the policy could encourage greater environmental responsibility and operational efficiency, provided that its implementation is transparent and the benefits are directly experienced by MSMEs.

These findings have important implications for the future management of carbon tax policies. The low level of understanding among MSMEs indicates that the effectiveness of carbon tax implementation may be limited if policymakers focus solely on taxation mechanisms without strengthening awareness and capacity-building programs. A lack of understanding may lead to resistance, low compliance, and negative perceptions toward environmental policies. Therefore, future carbon tax management should integrate fiscal objectives with educational and empowerment strategies to ensure that MSMEs can actively participate in the transition toward a low-carbon economy.

To improve the sustainability of carbon tax implementation, several processes need to be undertaken. First, the government should conduct continuous socialization and educational programs to increase MSMEs' understanding of carbon emissions, environmental impacts, and the objectives of carbon taxation. Second, technical assistance and training should be provided to help MSMEs adopt energy-efficient technologies and environmentally friendly production practices. Third, incentive mechanisms such as tax reductions, subsidies, green financing schemes, or grants should be introduced to reduce the financial burden of adaptation. Finally, effective collaboration among government institutions, business associations, academic institutions, and local communities is required to establish a supportive ecosystem for sustainable business transformation. Through these measures, carbon tax policies can function not only as fiscal instruments but also as catalysts for sustainable economic development and environmental responsibility among MSMEs.

MSME Perception towards Carbon Tax and Government Support
(Food Sector of Gorontalo Chy)

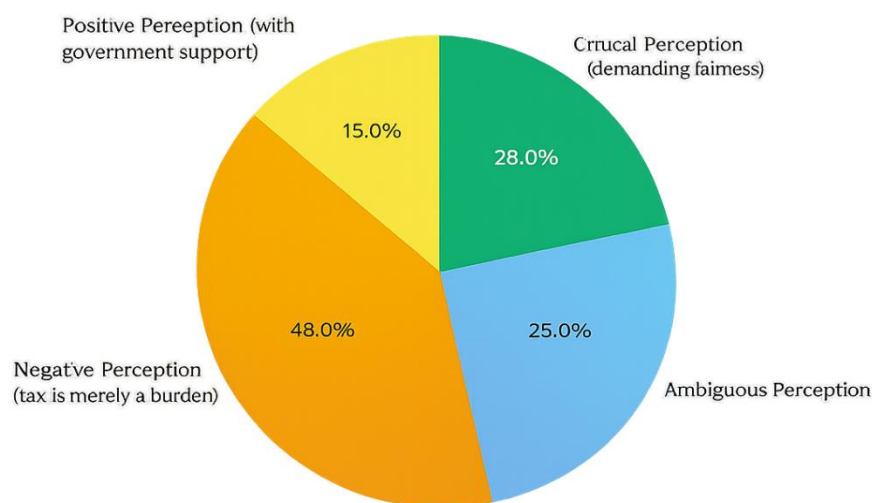


Diagram 2. MSMEs' Perception of Carbon Taxes and Government Support

Table 2. Summary of Perceptions of Carbon Taxes

Category: Presepsis	Percentage (Estimate)	Clue
Negative perception: taxes are just a burden	40%	"The profit is already thin; if there is an additional tax, we will definitely have to increase the price. This is burdensome."
Confused/grayed perception	25%	"What we know is that the carbon tax is for large industries, but it's not clear how to do it for small businesses."
Critical perception: demanding justice	20%	"Don't let MSMEs be taxed while large industries are easier to transfer costs to consumers."
Positive perception: accept if there is support	15%	"If there is an energy subsidy or assistance for energy-efficient machinery, we can be better prepared to support this policy."

Data Processing 2025

These findings show that MSMEs' perception of carbon tax policies remains dominated by negative views (40%) and confusion (25%), due to a lack of socialization and technical guidance from the government. Some MSMEs (20%) express a critical attitude by emphasizing the principles of fairness and transparency, while only a small percentage (15%) are willing to accept this policy if there is real support.

Thus, government support is a key factor in determining MSME revenue from the carbon tax. Without simple socialization, fiscal incentives, or assistance with green technology, these policies risk generating resistance. Conversely, with a fair and participatory approach, carbon taxes can be a momentum for MSMEs to transform towards more sustainable business practices.

Obstacles, Challenges, and Adaptation Strategies for MSMEs in Facing the Carbon Tax

The results of interviews with MSME actors in the food sector in Gorontalo City show that they face a series of obstacles and challenges in responding to the carbon tax discourse. The main obstacles arise from the aspects of technical, financial, technological, and regulatory understanding. The majority of MSMEs do not know how emissions are calculated or recorded, so they feel that this policy is complex and confusing. From a financial perspective, the thin profit margin makes them worry that the carbon tax will further pressure the business's competitiveness.

In addition, limited access to environmentally friendly technology is a real challenge. Many business actors admit they cannot afford to buy energy-efficient machines or environmentally friendly raw materials due to high prices. Complex regulations are also seen as inappropriate for small businesses, raising concerns about resistance if policies are implemented without clear guidance.

However, some MSMEs have begun to develop simple adaptation strategies. These strategies include improving energy efficiency in production processes, reducing raw material waste, minimizing the use of single-use plastics, and collaborating with other MSMEs in raw material distribution to reduce transportation costs and carbon emissions. Some business owners also recognize opportunities to market environmentally friendly products as a competitive advantage, although such opportunities remain limited.

The findings suggest that stakeholders and the government play a crucial role in strengthening these adaptation efforts. Government agencies can support MSMEs through environmental education programs, technical training, green financing schemes, and incentives for adopting low-carbon technologies. Business associations and other stakeholders can facilitate knowledge sharing, collaboration networks, and access to sustainable business practices. These initiatives can help MSMEs improve their environmental performance while reducing the costs associated with compliance with future carbon tax regulations.

From a corporate perspective, the implementation of carbon tax policies may encourage firms to improve operational efficiency, invest in cleaner technologies, and adopt more sustainable production processes. Although compliance may initially increase operational costs, companies that successfully adapt may benefit from long-term cost savings, enhanced competitiveness, improved corporate reputation, and greater access to environmentally conscious markets. Therefore, carbon taxation should be viewed not only as a fiscal instrument but also as a driver of sustainable business transformation and environmental responsibility.

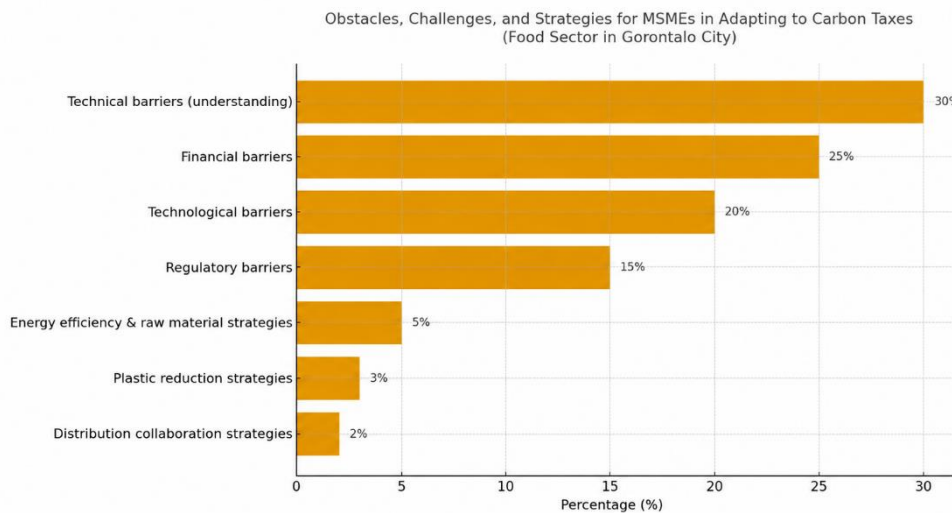


Diagram 3. Obstacles and Strategies for Adaptation of MSMEs to Carbon Taxes

Table 3. Summary of Obstacles, Challenges, and Adaptation Strategies for MSMEs

Aspects	Percentage (Estimate)	Clue
Obstacles		
Technical barriers (understanding)	30%	"We don't know what emissions mean in the context of our business. If we ask for a report, we are confused."
Financial barriers	25%	"The profits are already thin; if there is an additional tax, we will have difficulties."
Technological barriers	20%	"There are energy-efficient machines, but they are expensive. We can't afford to buy it ourselves."

Aspects	Percentage (Estimate)	Clue
Regulatory barriers	15%	"The rules usually use technical language, and we find it difficult to understand. There must be simple guidelines specifically for MSMEs."
Adaptation Strategy		
Adaptation strategy: efficiency	5%	"We are used to producing large quantities at once, so that we can save electricity and gas."
Adaptation strategy: plastic reduction	3%	"I started reducing single-use plastics, and customers also prefer paper packaging."
Adaptation strategy: collaboration	2%	"We often have transportation joint ventures with other MSMEs."

Source: processed data, 2025

The results showed that the biggest obstacles for MSMEs are limited technical understanding (30%) and financial capacity (25%), followed by technological limitations (20%) and complex regulations (15%). Meanwhile, the adaptation strategy remains simple, focusing on energy efficiency, reducing single-use plastics, and promoting distribution cooperation.

These findings confirm that without government support in the form of socialization, incentives, and access to environmentally friendly technology, MSMEs will struggle to adapt independently. However, the small efficiency efforts made show that there is potential to drive transformation if accompanied by inclusive assistance and policies.

Discussion

The Level of Understanding and Readiness of MSMEs to the Carbon Tax Policy

The results of interviews with MSMEs in the food sector in Gorontalo City indicate that their understanding of carbon tax policy remains low. Most business actors admitted they had only heard the term "carbon tax" for the first time when interviewed. This shows that environmental-based fiscal issues have not yet become part of the economic discourse at the top business level. From a tax accounting perspective, this limited understanding shows that MSMEs' fiscal literacy remains focused on conventional tax obligations, such as final income tax (PPH) and restaurant taxes. In contrast, the concept of emissions-based taxes has not been included in their recording practices (Judijanto, 2025).

This condition can be understood through *a tax literacy framework* that emphasizes the importance of taxpayers' understanding in carrying out their tax obligations. According to Kristanto & Noreen (2021), a low level of tax literacy will have an impact on fiscal compliance because taxpayers are unable to relate formal obligations to daily business activities. In the context of MSMEs in Gorontalo, this low tax literacy is evident in their lack of knowledge about how carbon emissions are produced, measured, and translated into the tax base. Thus, low understanding is not only a technical problem, but also a conceptual problem.

This limited understanding also has direct implications for MSME readiness. In interviews, many business actors said that they do not have a recording system that allows them to separate costs related to energy, fuel, or waste. In fact, these aspects are a crucial basis in calculating carbon taxes. Their accounting system is still simple,

focusing on recording cash inflows and outflows, without including the environmental cost dimension. This is consistent with research by Larasati et al (2025) This states that most Indonesian MSMEs still use cash-based manual recording, so they do not have adequate accounting data to support more complex tax obligations.

In terms of tax compliance theory, taxpayers' readiness is influenced by three main factors: understanding of rules, administrative capacity, and perception of tax fairness (Romadhon & Diamastuti, 2020). Based on interviews, these three factors appear to be weak in MSMEs in Gorontalo. First, there is almost no understanding of carbon tax rules. Second, the administrative capacity is low because their financial records are simple and not based on modern accounting systems. Third, the perception of tax fairness is negative because they think this policy will only add to the burden without providing direct benefits. The combination of these three factors leaves MSMEs' readiness far from ideal.

When it comes to regional tax accounting, this problem becomes more complex. The carbon tax is basically a national policy regulated in the Law on the Harmonization of Tax Regulations (UU HPP). However, implementation at the local level will involve local governments, both as supervisors and facilitators. In the context of fiscal decentralization, local governments are expected to play a role not only as tax collectors but also as public service providers that support increasing tax compliance. Bird and Zolt (2005) argued that the effectiveness of tax administration in developing countries depends largely on institutional capacity, administrative efficiency, and taxpayers' understanding of fiscal policies. However, interviews show that so far, there have been no real steps by the Gorontalo regional government to socialize or assist MSMEs regarding the carbon tax.

From a management accounting perspective, the low readiness of MSMEs reflects the limited integration of environmental considerations into their cost management systems. If MSMEs systematically record energy consumption, raw material usage, and waste generation costs, this information can be used not only for carbon tax calculations but also as a basis for improving operational efficiency. According to Susanto and Meiryani (2019), Environmental Management Accounting (EMA) helps organizations identify environmental costs, improve resource efficiency, and support sustainable managerial decision-making. However, the interview findings indicate that most MSMEs still lack the awareness, knowledge, and technical capacity to implement EMA practices. Consequently, the potential of carbon taxation as a mechanism for encouraging efficiency and environmental responsibility has not yet been fully realized.

These findings are consistent with previous studies that highlight the challenges faced by small businesses in responding to environmental regulations due to limited resources, knowledge, and managerial capabilities. Earlier research has shown that environmental policies are generally more effective when accompanied by capacity-building programs, technical assistance, and financial incentives that support business adaptation. This condition is also evident in the current Indonesian context, where the government has gradually introduced carbon tax policies as part of its commitment to reducing greenhouse gas emissions and achieving sustainable development goals. At the same time, increasing global attention to Environmental, Social, and Governance (ESG) practices, carbon disclosure, and net-zero emission targets has encouraged companies to adopt more environmentally responsible business strategies.

In addition, the readiness aspect can be analyzed through the compliance cost of taxation framework (Sandford, 1995), which emphasizes that compliance costs significantly influence taxpayer behavior (Rasyid, 2022). For MSMEs in Gorontalo,

carbon taxation is perceived as a policy that may increase compliance costs through additional administrative requirements and potential increases in energy and fuel prices. Given their limited profit margins, many MSMEs believe they may struggle to absorb these additional costs. As a result, their readiness is constrained not only by technical limitations but also by financial vulnerability.

Despite these challenges, the interviews reveal considerable potential for improving preparedness through government intervention and stakeholder collaboration. Several MSMEs expressed their willingness to participate in training programs, mentoring activities, and sustainability initiatives if such support is provided. This finding indicates the existence of latent readiness, whereby business actors remain open to learning and adapting despite their current limitations. Therefore, government institutions, business associations, and academic institutions should collaborate to strengthen environmental awareness, improve fiscal literacy, and support the adoption of environmental management accounting practices among MSMEs.

For companies, the implementation of carbon taxation can create both challenges and opportunities. In the short term, businesses may face higher operational and compliance costs. However, in the long term, carbon tax policies can encourage investments in energy-efficient technologies, resource optimization, waste reduction, and cleaner production processes. These improvements can help companies reduce carbon emissions, enhance environmental sustainability, improve competitiveness, and strengthen their reputation among increasingly environmentally conscious consumers and investors. Therefore, carbon taxation should be viewed not only as a fiscal instrument but also as a strategic mechanism for supporting sustainable business transformation and long-term environmental sustainability.

Policy Perception and Government Support in the Implementation of Carbon Tax

The results of interviews with MSME actors in the food sector in Gorontalo City show that their perception of the carbon tax policy remains dominated by the view that it is an additional fiscal burden. MSMEs do not fully understand the primary purpose of the carbon tax as an emissions-control instrument, but see it only through the lens of tax obligations. This view is in line with the *tax compliance theory* framework (Devos, 2014) in (Wijaya, 2022) This emphasizes that the level of taxpayer compliance is influenced by the perception of system complexity, fairness of the tax burden, and the direct benefits felt. Among MSMEs in Gorontalo, perceptions tend to be negative because the carbon tax is seen as increasing production costs without providing tangible benefits for business continuity.

From a tax accounting perspective, this shows a limited understanding of integrating environmental fiscal policies into business recording practices. The majority of MSMEs still use simple cash-based recording and only recognize basic tax obligations, such as MSME final income tax or regional taxes (for example, restaurant taxes). The concept of an emission-based tax that requires additional recording of energy or fuel consumption is not included in the simple accounting system they use. This condition is consistent with the research of Larasati et al (2025), which states that tax accounting practices among MSMEs remain limited to transactional recording, not addressing aspects of cost management or external recording.

In the framework of regional tax accounting, the perception of MSMEs can also be associated with the principle of tax fairness. According to *the benefit principle* theory (Musgrave & Musgrave, 1989), taxpayers will be more compliant if they feel that the tax burden is proportional to the benefits they receive from the government (Budiman et al., 2024). Interviews show that MSMEs in Gorontalo find it challenging

to see the link between the carbon tax and the direct benefits it brings to their businesses. They think that carbon taxes will only add to costs without compensation in the form of fiscal incentives or government support programs. This has implications for a low perception of tax fairness, which in turn will affect their level of compliance with policies.

In addition, the interviews indicate uncertainty about the technical mechanism for imposing a carbon tax at the small-business level. For some MSMEs, the complexity of emission-based calculations raises administrative concerns. They are used to a final, straightforward tax system, such as a 0.5% MSME Income Tax, so the existence of emissions-based taxes is perceived as adding to the complexity of record-keeping. From an accounting perspective, this can be understood through the framework of *compliance cost of taxation* (Sandford, 1995), which emphasizes that the complexity of tax administration is one of the most decisive factors in taxpayer compliance, especially for small businesses that have limited resources (Urumsah & Rasyid, 2023).

On the other hand, the interviews also show that there is room to build positive perceptions through government support. Some informants expressed their willingness to adjust the recording of energy costs and the use of raw materials if there is socialization and simple guidelines. Alm (1999) explained that taxpayers are more likely to comply with tax obligations when they perceive that government services and public benefits are fairly aligned with the taxes they pay. In the context of a carbon tax, these public services can take the form of emissions recording training, fiscal incentives for environmentally friendly investments, or subsidies for energy efficiency technologies.

From a management accounting perspective, government support is also important for encouraging MSMEs to adopt environmental accounting practices. Nuha et al. (2025) found that the adoption of environmental accounting among MSMEs is significantly influenced by institutional support, technical guidance, and organizational readiness. Environmental accounting can help business owners identify and monitor costs related to energy consumption, raw material usage, and waste generation, thereby supporting more effective environmental and financial management. However, many MSMEs still face limitations in technical knowledge and internal resources, making training and capacity-building programs essential. Local governments can play an important role by providing simple accounting guidelines and technical assistance that can be integrated into existing MSME bookkeeping systems.

Obstacles, Challenges, and Adaptation Strategies for MSMEs in Facing the Carbon Tax

Interviews with MSMEs in the food sector in Gorontalo City show that they face various obstacles and challenges in responding to the carbon tax discourse. These barriers can be seen from three main dimensions: limited accounting recording capacity, financial limitations, and regulatory uncertainty. From the perspective of environmental cost accounting, the biggest challenge for MSMEs is the lack of a system capable of identifying, measuring, and reporting environmental costs relevant to the carbon tax base. The majority of MSMEs still record operational costs globally without separating the costs of energy, raw materials, or waste, which can be indicators of carbon emissions.

This has implications for the difficulty in assessing the impact of carbon taxes on their cost structure. Hansen and Mowen (2005) emphasized that cost accounting assists organizations in identifying cost drivers and improving operational efficiency through effective cost management and resource allocation. However, the results of the interviews show that MSMEs have not used an in-depth cost accounting

approach, so they are unable to calculate how much energy consumption or raw materials are likely to be subject to carbon taxes. As a result, carbon taxes are perceived as an immeasurable threat, rather than as a variable that can be managed through an accounting system.

From a financial perspective, limited capital is also a significant challenge. Many MSME actors state that their profit margins are relatively small, so the existence of a carbon tax is feared to reduce profitability directly. According to the theory of *the compliance cost of taxation* (Sandford, 1995), *the tax burden felt by taxpayers is not only the taxes paid* but also administrative and compliance costs. For MSMEs in Gorontalo, both forms of burden are heavy: they not only have to pay additional taxes, but also build a record-keeping system that they have never done before. This raises concerns that the carbon tax could reduce the competitiveness of MSMEs if it is not balanced with fiscal incentives or government support.

Another challenge that arises is regulatory uncertainty. Many informants expressed confusion about how the carbon tax would be calculated and applied at the trim business level. In the context of regional tax accounting, the ambiguity of this regulation directly affects tax compliance. Devos (2014) in (Wijaya, 2022) Emphasized that legal certainty and clarity of rules are key factors in increasing taxpayer compliance. Without clear guidelines, MSMEs will find it difficult to adjust their recording and reporting, increasing the risk of tax non-compliance.

However, the interviews also show that, despite facing many obstacles, MSMEs have begun to develop adaptation strategies, though they remain unstructured and straightforward. One of the most commonly cited strategies is energy efficiency and raw-material savings. MSMEs recognize that electricity and fuel use are among the most significant cost components of their operations. By reducing energy consumption, they not only reduce production costs but also indirectly reduce carbon emissions. From the perspective of management accounting, this strategy can be categorized as *a cost reduction strategy*, which aims to reduce production costs through resource efficiency (Horngren et al., 2012) (Kasse & Damayanti, 2016).

In addition to efficiency, some MSMEs also mentioned other adaptation steps, such as reducing the use of single-use plastics, utilizing local raw materials, or doing simple recycling. Although their primary motivation is cost savings, these measures are indirectly in line with the objectives of carbon tax policies. In the environmental accounting literature, this kind of strategy is known as a *win-win strategy*, where cost efficiency measures also produce environmental benefits (Burritt & Schaltegger, 2010) (Santoso & Setiawan, 2023).

From the perspective of regional taxation accounting, MSME adaptation strategies show an opportunity to integrate carbon tax obligations into their simple accounting practices. For example, the recording of electricity and fuel costs currently carried out globally can be presented as a separate item in the financial statements. This will make it easier for them to calculate their carbon tax liabilities and provide more accurate data for internal cost analysis. However, without technical guidance from local governments, this strategy is challenging to realize. Local governments need to provide a simple recording format that MSMEs can adopt to ensure this adaptation strategy runs effectively.

Conclusions and Suggestions

This study concludes that the level of understanding and readiness among MSMEs towards carbon tax policies remains low, with the majority of business actors not fully understanding the implications of the policy. The perception that emerges tends to be negative because carbon taxation is viewed as an additional financial burden, although a small number of MSMEs are willing to adapt if supported by

government incentives, technical assistance, and capacity-building programs. The main obstacles include limited technical knowledge, financial constraints, restricted access to environmentally friendly technology, and the complexity of regulatory requirements. Existing adaptation strategies remain limited to basic efficiency measures, indicating that the transition toward sustainable business practices is still at an early stage. Therefore, the successful implementation of carbon tax policies among MSMEs largely depends on government support through socialization programs, fiscal incentives, technical guidance, and improved access to green technologies.

This study has several limitations. First, the research was conducted only among MSMEs in the food and beverage sector in Gorontalo City, limiting the generalizability of the findings to other sectors and regions. Second, the study employed a qualitative approach with a relatively limited number of informants, which may not fully capture the diversity of perspectives among MSMEs in Indonesia. Third, the study focused primarily on perceptions and readiness toward carbon tax policies and did not measure actual carbon emissions, environmental performance, or the financial impacts of carbon taxation on businesses.

Future research is recommended to expand the scope of analysis by involving MSMEs from different sectors and geographical areas to obtain a broader understanding of carbon tax readiness. Further studies may also adopt mixed-methods or quantitative approaches to examine the relationship between environmental awareness, business performance, environmental management accounting practices, and carbon tax compliance. In addition, future researchers are encouraged to investigate the long-term effects of carbon taxation on business sustainability, carbon emission reduction, and the achievement of environmental sustainability goals in developing economies.

Confession

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References

- Alm, J. (1999). Tax compliance and administration. In W. B. Hildreth & J. A. Richardson (Eds.), *Handbook on Taxation* (pp. 741–768). New York, NY: Marcel Dekker.
- Bird, R. M., & Zolt, E. M. (2005). Redistribution via taxation: The limited role of the personal income tax in developing countries. *UCLA Law Review*, 52(6), 1627–1695.
- Budiman, A., Putri, D., & Ramadhan, F. (2024). Tax fairness and taxpayer compliance in developing countries. *Journal of Accounting and Tax Studies*, 12(2), 101–115.
- Burritt, R. L., & Schaltegger, S. (2010). Sustainability accounting and reporting: Fad or trend? *Accounting, Auditing & Accountability Journal*, 23(7), 829–846. <https://doi.org/10.1108/09513571011080144>
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (4th ed.). Sage Publications
- Devos, K. (2014). *Factors influencing individual taxpayer compliance behaviour*. Springer.
- Hansen, D. R., & Mowen, M. M. (2005). *Management accounting* (7th ed.). South-Western College Publishing.
- Harfiani, H. (2025). Implementasi pajak karbon di Indonesia: Tantangan dan implikasinya terhadap keadilan sosial. *PESHUM: Jurnal Pendidikan, Sosial dan*

- Humaniora*, 4(3), 4983–4987. <https://doi.org/10.56799/peshum.v4i3.9252>
- Hornigren, C. T., Datar, S. M., & Rajan, M. V. (2012). *Cost accounting: A managerial emphasis* (14th ed.). Pearson.
- Jasch, C. (2003). The use of environmental management accounting (EMA) for identifying environmental costs. *Journal of Cleaner Production*, 11(6), 667–676. [https://doi.org/10.1016/S0959-6526\(02\)00107-5](https://doi.org/10.1016/S0959-6526(02)00107-5)
- Kasse, R., & Damayanti, N. (2016). Cost reduction strategy through resource efficiency in small business management. *Jurnal Akuntansi dan Bisnis*, 16(2), 85–97.
- Kristanto, A. B., & Noreen, C. A. (2021). Kepatuhan di tengah kompleksitas pajak: Apakah literasi memiliki peran? *Jurnal Riset Akuntansi dan Perpajakan*, 8(2), 233–248. <https://doi.org/10.35838/jrap.2021.008.02.14>
- Larasasti, S., Manao, M., Ramadhani, S., Sari, P., & Franita, R. (2025). Implementation of simple accounting based on SAK EMKM on MSME Kripik Pak Dhe. *Jurnal Akuntansi, Manajemen, dan Perencanaan Kebijakan*, 2(4), 1–11. <https://doi.org/10.47134/jampk.v2i4.692>
- Musgrave, R. A., & Musgrave, P. B. (1989). *Public finance in theory and practice* (5th ed.). McGraw-Hill.
- Nuha, S. U., Meilan, R., & Bahodirovich, K. B. (2025). Understanding Institutional Influences on MSMEs' Environmental Accounting Adoption. *Journal of Accounting Science*, 9(2), 313–323. <https://doi.org/10.21070/jas.v9i2.1921>
- Rahman, F., Sayogo, E., Husnah, F., & Maharani, G. S. (2024). Optimalisasi pendapatan negara: Strategi dekarbonisasi melalui kebijakan pajak karbon untuk keberlangsungan industri manufaktur Indonesia. *Prosiding Seminar Nasional Ekonomi dan Perpajakan*, 4(1). Fakultas Ekonomi dan Bisnis, Universitas Negeri Malang. <https://conference.um.ac.id/index.php/taxcenter/article/view/9929>.
- Rasyid, A. (2022). Tax compliance costs and MSME tax behavior in Indonesia. *Jurnal Perpajakan Indonesia*, 6(2), 87–101.
- Romadon, F., & Diamastuti, E. (2020). Kepatuhan pajak: Sebuah analisis teoritis berdasarkan perspektif teori atribusi. *Jurnal Ilmiah ESAI*, 14(1), 17–35. <https://doi.org/10.25181/esai.v14i1.2382>
- Sandford, C. (1995). *Tax compliance costs: Measurement and policy*. Fiscal Publications.
- Santoso, B., & Setiawan, H. (2023). Environmental accounting and business sustainability in MSMEs. *Journal of Environmental Economics and Accounting*, 5(2), 77–91.
- Sulistiyo, U. (2023). *Metode penelitian kualitatif*. PT Salim Media Indonesia.
- Susanto, A., & Meiryani, M. (2019). Antecedents of Environmental Management Accounting and Environmental Performance: Evidence from Indonesian Small and Medium Enterprises. *International Journal of Energy Economics and Policy*, 9(6), 401–407. <https://doi.org/10.32479/ijeep.8366>
- Undang-Undang Republik Indonesia Nomor 7 Tahun 2021 tentang Harmonisasi Peraturan Perpajakan.
- Urumsah, D., & Rasyid, A. (2023). Administrative complexity and taxpayer compliance among MSMEs. *Journal of Tax Policy and Administration*, 11(3), 145–159.
- Widayati, D. T. S. E. M. S. (2025). *Keberlanjutan UMKM di Indonesia: Strategi dan implementasi*. Penerbit KBM Indonesia.
- Wijaya, R. (2022). Tax compliance behaviour and environmental taxation policy. *Jurnal Akuntansi dan Kebijakan Publik*, 10(2), 112–126.