MICRO-LEVEL CARBON CREDIT TRADING BUSINESS FOR GREENHOUSE GAS REDUCTION AMONG THE PUBLIC IN BANGKOK

Pinyaluck Ekwaraleartwong
PhD student, Doctor of Philosophy Program, Innovation Management,
Suan Sunandha Rajabhat University
Email; s66584945007@ssru.ac.th
Tanapol Kortana
Department of Management Innovation, Suan Sunandha Rajabhat University
Email; tanapol.ko@ssru.ac.th
Bundit Pungnirand
Department of Management Innovation, Suan Sunandha Rajabhat University
Email; Email: bundit.pu@ssru.ac.th

Abstract

The research on micro-level carbon credit trading for greenhouse gas reduction among Bangkok residents aims to study knowledge and guidelines for expanding the carbon credit market, as well as factors influencing trading decisions. Utilizing qualitative methods, the study highlights the importance of carbon credits—rights to emit one metric ton of CO2—as key incentives for emissions reduction. Regulatory frameworks like the Kyoto Protocol and the Paris Agreement underpin these markets, which are classified into compliance and voluntary types. Effective trading mechanisms, such as cap-and-trade systems and rigorous auditing processes, are vital for maintaining the integrity of carbon credits. Nevertheless, challenges like market volatility and equity concerns persist. The study identifies influencing factors using the marketing mix (4Ps): providing diverse carbon credit products, establishing competitive pricing, ensuring accessible trading platforms, and promoting educational campaigns. These strategies are designed to enhance participation, support environmental sustainability, and advance Bangkok's climate goals.

Keywords: Carbon credits, carbon market, greenhouse gas reduction

Introduction

Climate change poses a formidable threat to global ecosystems and urban environments, with projections indicating a troubling increase in global temperatures. The World Meteorological Organization anticipates a rise of 66% in average temperatures between 2023 and 2027, potentially exceeding pre-industrial levels by more than 1.5 degrees Celsius. There is a 98% likelihood that at least one of the next five years will set new historical temperature records, further intensified by severe "El Niño" phenomena (Petteri Taalas cited in WMO, 2023). This trend highlights that global warming, driven primarily by human activities, is not a natural occurrence but a direct consequence of greenhouse gas emissions from sectors such as transportation, electricity generation, agriculture, and industry (Wikanda Wanwiset, 2015; EPA, 2022).

To combat climate change effectively, it is crucial to reduce greenhouse gas emissions and replace these emissions through mechanisms like carbon credits—tradable permits that allow entities to offset their emissions by supporting carbon-reducing projects. The concept of carbon credits originated with the Kyoto Protocol under the United Nations Framework Convention on Climate Change (UNFCCC), which established binding targets for developed countries to reduce emissions (Kanjana Saenglimsuwan, 2011). This framework not only mandates emission reduc

tions but also encourages collaboration between developed and developing nations to foster sustainable development.

Micro-scale carbon credit trading presents a viable strategy for reducing greenhouse gas emissions in urban areas like Bangkok, which faces significant air pollution and rising temperatures. This system enables individuals and small businesses to engage in climate change mitigation by buying and selling emission permits (Ellerman et al., 2010).

Community involvement in carbon markets can bolster national policies and raise public awareness about climate issues (Kollmuss et al., 2010). In a densely populated and industrial city like Bangkok, innovative solutions such as micro-scale trading can democratize access to carbon markets, allowing grassroots participation while generating economic benefits (Gonzalez & Matus, 2020). Local engagement is crucial, as community initiatives can drive behavioral change and foster environmental responsibility (Thøgersen & Ölander, 2003). However, challenges such as lack of awareness, regulatory uncertainty, and perceived complexity may hinder participation (Wara, 2007). Addressing these barriers through educational campaigns and simplified trading mechanisms is essential for success (Popp et al., 2010).

This study applies the Marketing Mix Factors (4Ps) – Product, Price, Place, Promotion – to influence micro-level carbon credit trading decisions in Bangkok, aiming to reduce greenhouse gas emissions while promoting community engagement. This approach could serve as a model for other Southeast Asian cities.

Research Objectives

1. To study the knowledge and guidelines for expanding the carbon credit market in the future.

2. To study the factors that influence the decision to trade carbon credits at the micro level among Bangkok residents to reduce greenhouse gases.

Scope of the Research

This research is document research which has research scope as follows

1. The population scope

The population scope of this research encompasses four key groups in Bangkok, each contributing unique insights into the micro-level carbon credit trading business for greenhouse gas reduction. These groups include:

1.1 Local Residents: Individuals living in Bangkok who have the potential to participate in carbon credit trading by adopting sustainable practices, such as recycling, energy conservation, and reduced carbon emissions.

1.2 Small Business Owners: Entrepreneurs operating small businesses in Bangkok that may engage in or benefit from carbon credit trading, especially those implementing sustainable practices in their operations.

1.3 Environmental NGOs: Representatives from non-governmental organizations focused on environmental conservation, climate change advocacy, and sustainability, who can provide perspectives on carbon credit initiatives and community engagement.

1.4 Government Agencies: Officials from relevant government bodies involved in environmental policy, regulation, and carbon credit trading schemes, offering insights into the framework, challenges, and support for such initiatives.

2. Variable scope:

2.1 Knowledge and practices for expanding the carbon credit market in the future

2.2 Marketing Mix Factors (4Ps) – Product, Price, Place, Promotion that influence the decision to trade carbon credits at the micro level to reduce greenhouse gases as follows:

3. Time Scope: May - October 2024

Research Methodology

1. Research Methodology

This study employs a qualitative research approach to explore the micro-level carbon credit trading business for greenhouse gas reduction among the public in Bangkok. The research aims to gather in-depth insights from key informants, including local residents, small business owners, environmental NGOs, and government agencies, to understand their perspectives and experiences regarding carbon credit trading.

2. Research Steps

2.1 Literature Review: Conduct a comprehensive review of existing literature on carbon credit trading, sustainable practices, and greenhouse gas reduction to establish a theoretical framework for the study.

2.2 Define Key Informants: Identify and select 20 key informants representing the target groups: local residents, small business owners, environmental NGOs, and government agencies.

2.3 Develop Interview Guide: Create a semi-structured interview guide that includes open-ended questions to facilitate in-depth discussions on carbon credit trading experiences, perceptions, and barriers.

2.4 Conduct Interviews: Schedule and conduct in-depth interviews with the selected key informants, ensuring a comfortable environment for open dialogue.

2.5 Transcribe Interviews: Transcribe the recorded interviews for thorough analysis.

3. Data Collection

Data will be collected through:

3.1 Document Analysis: Review relevant documents, policies, and reports related to carbon credit trading and greenhouse gas reduction initiatives in Bangkok.

3.2 In-Depth Interviews: Conduct 20 interviews with key informants using a semi-structured format to allow flexibility in responses while ensuring coverage of essential topics.

4. Data Analysis

4.1 Thematic Analysis: Analyze the transcribed interviews using thematic analysis to identify recurring themes, patterns, and insights related to carbon credit trading and its impact on greenhouse gas reduction.

4.2 Coding: Develop a coding scheme to categorize responses based on key themes and concepts that emerge from the data.

4.3 Synthesis: Synthesize findings to draw conclusions regarding the feasibility and challenges of micro-level carbon credit trading in Bangkok, highlighting insights from various stakeholder perspectives.

Research Results

1. Knowledge and practices for expanding the carbon credit market in the future

The carbon credit market is an important mechanism for reducing greenhouse gas emissions and addressing climate change. There are knowledge and practices for expanding the carbon credit market in the future as follows:

1.1 Overview of Carbon Credits

A carbon credit is a certificate that permits the holder to emit one metric ton of carbon dioxide or its equivalent in other greenhouse gases, generated through projects focused on emission reductions, such as renewable energy, energy efficiency, and reforestation. The main purpose of the carbon credit market is to provide financial incentives for organizations to

lower their carbon footprints by enabling the trading of these credits based on their emission levels.

1.2 Regulatory Frameworks

The Kyoto Protocol, established in 1997, was a groundbreaking treaty that imposed legally binding commitments on developed countries to reduce greenhouse gas emissions, introducing mechanisms such as emissions trading and the Clean Development Mechanism. Building on this foundation, the Paris Agreement, adopted in 2015, aims to foster a global response to climate change by encouraging countries to set their own emissions reduction targets, with carbon markets playing a crucial role in achieving these goals.

1.3 Types of Carbon Markets

Compliance markets are regulated systems where companies must adhere to government-imposed emission limits, requiring those that exceed their limits to purchase carbon credits from entities that have successfully reduced their emissions. In contrast, voluntary markets operate outside of these regulations, allowing companies and individuals to buy carbon credits on a voluntary basis to offset their emissions for ethical or reputational purposes.

1.4 Trading Mechanisms

Cap-and-trade systems involve governments setting a cap on total emissions and allocating allowances to companies, enabling those that successfully reduce emissions to sell their excess allowances. Carbon exchanges, such as the European Union Emissions Trading System (EU ETS), provide platforms for trading these carbon credits, which enhance market liquidity and facilitate price discovery.

1.5 Verification and Certification

Projects generating carbon credits must adhere to strict standards for measurement and verification, with organizations like Verra and the Gold Standard providing certification to ensure the credibility of carbon offset initiatives. A crucial aspect of this process is "additionality," which ensures that the emissions reductions would not have happened without the incentive of carbon credits, thereby maintaining the integrity of the market.

1.6 Challenges and Criticisms

Market volatility in carbon credit pricing can significantly affect investment decisions and the overall effectiveness of emissions reduction efforts. Additionally, there are concerns that carbon markets may disproportionately benefit wealthier entities, enabling them to avoid making genuine emissions reductions, which could undermine social equity and fairness within the market.

1.7 Future Directions

Ongoing research into innovative practices, such as carbon capture and storage (CCS), holds the potential to generate additional carbon credits and broaden market opportunities. Furthermore, integrating various carbon markets globally could enhance liquidity and establish a more effective framework for reducing emissions.

2. Factors that influence the decision to trade carbon credits at the micro level among Bangkok residents to reduce greenhouse gases.

To effectively influence micro-level carbon credit trading decisions among Bangkok residents, the Marketing Mix Factors (4Ps) — Product, Price, Place, and Promotion — can be strategically applied:

2.1 Product

To effectively expand the carbon credit market, it is essential to offer a diverse range of carbon credit products tailored to various user segments, including individuals, small businesses, and community projects, encompassing credits from renewable energy, reforestation, and energy efficiency initiatives. Ensuring that these credits are certified by

reputable organizations will guarantee their authenticity and additionality, fostering trust among traders. Additionally, developing user-friendly online trading platforms will make the buying and selling of carbon credits more accessible and navigable for residents.

2.2 Price

To enhance participation in the carbon credit market, it is crucial to establish competitive pricing strategies that reflect the true value of carbon credits while maintaining market competitiveness, as transparency in pricing can attract more participants. Additionally, offering incentives such as discounts for first-time buyers and reduced fees for community groups and small businesses can further encourage engagement. Providing flexible payment options, including installment plans for larger purchases, will accommodate varying financial capacities and promote wider participation.

2.3 Place

To enhance participation in carbon trading, it is essential to ensure that trading platforms are easily accessible both online and through local community centers or events, as physical presence in local markets can boost visibility. Collaborating with local NGOs, community organizations, and government agencies will help promote carbon trading initiatives, reaching underserved communities and building trust. Additionally, establishing local trading hubs will allow residents to learn about and engage in carbon credit trading, fostering a sense of community ownership and involvement.

2.4 Promotion

To promote engagement in carbon trading, it is important to launch targeted educational campaigns that inform residents about the benefits, mechanics, and environmental impacts of carbon trading, supplemented by workshops and seminars for deeper understanding. Utilizing social media platforms to raise awareness, share success stories, and encourage community involvement can further spark interest. Additionally, organizing community events like “carbon trading fairs” or sustainability expos will provide engaging opportunities for residents to learn about carbon credits, interact with traders, and explore trading options.

Conclusion: By strategically leveraging the 4Ps of marketing—Product, Price, Place, and Promotion—stakeholders can effectively influence micro-level carbon credit trading decisions among Bangkok residents. This approach can enhance participation, promote environmental sustainability, and contribute to the city’s climate goals.

Discussion

1. A critical finding in the research is the significant influence of regulatory frameworks on the carbon credit market. The Kyoto Protocol and the Paris Agreement serve as pivotal structures that established the groundwork for emissions trading while encouraging broader participation in carbon markets. The Kyoto Protocol, which introduced legally binding commitments for developed nations, laid the foundation for mechanisms such as the Clean Development Mechanism (CDM) (Barker et al., 2007). This established a model for how emissions trading could be utilized to achieve international climate goals. According to a report by the United Nations Framework Convention on Climate Change (UNFCCC), the CDM has enabled over 8,000 projects in developing countries, demonstrating its efficacy in facilitating emissions reductions (UNFCCC, 2019).

Following this, the Paris Agreement's flexibility in allowing countries to set their own emissions reduction targets has been instrumental in fostering a global response to climate change. Research by Friedlingstein et al. (2019) shows that this approach has encouraged a wider array of nations to commit to climate action, resulting in significant anticipated reductions in global greenhouse gas emissions. The integration of compliance markets, where companies must adhere to regulatory limits, with voluntary markets, which enable

organizations to purchase credits for ethical reasons, demonstrates how diverse market structures can coexist and enhance overall effectiveness (Bumpus & Liverman, 2008). Data indicates that regions with robust regulatory frameworks experience more significant emissions reductions compared to those without stringent policies (Carbone et al., 2013), highlighting the importance of governance in the carbon credit market.

Moreover, the role of verification and certification bodies like Verra and the Gold Standard cannot be understated. These organizations ensure the integrity of carbon credits through strict adherence to standards, particularly the concept of "additionality," which guarantees that emissions reductions are genuinely attributable to the incentives provided by carbon credits (Peters-Stanley & Gonzalez, 2014). Regulatory rigor not only fosters market confidence but also enhances the credibility of the entire carbon trading ecosystem, as noted by Cames et al. (2016), who emphasize that robust certification practices can prevent fraud and improve market stability.

2. Another critical finding is the impact of market volatility on investment decisions within the carbon credit market. The research highlights that fluctuations in carbon credit prices can deter both businesses and individuals from investing in emissions-reducing projects. Zhang and Wang (2018) emphasize that price instability not only undermines confidence in the market but also complicates long-term planning for companies looking to invest in sustainable technologies.

Market volatility can be particularly pronounced in compliance markets, where regulatory changes can significantly affect credit prices. For example, when the European Union adjusted its cap on emissions, it resulted in dramatic swings in carbon prices, which affected investment levels in renewable energy projects (Tietenberg, 2006). This volatility raises concerns about the overall effectiveness of the carbon credit market as a tool for reducing emissions, as inconsistent pricing can lead to uncertainty in long-term investments. Addressing these issues through mechanisms such as price floors or ceilings could stabilize the market, making it a more reliable option for businesses seeking to invest in carbon reduction strategies (Roberts & Parks, 2007). Ensuring a more predictable pricing structure may encourage greater participation and commitment to sustainability initiatives, ultimately enhancing the market's effectiveness in combating climate change.

Recommendations

1. Recommendations for the application of research results

1.1 Develop initiatives that actively involve local communities in carbon credit trading, such as local forums or workshops. These programs should focus on educating residents about the benefits and processes of trading carbon credits.

1.2 Create incentive schemes for first-time participants, such as discounts on initial purchases or rewards for community group involvement. This can encourage wider participation and engagement in the carbon credit market.

1.3 Collaborate with NGOs and community organizations to enhance outreach efforts. These partnerships can help promote carbon trading initiatives and build trust within communities, especially among underserved populations.

2. Recommendations for Future Research

2.1 Market Behavior Studies: Conduct research to understand the behavioral factors that influence residents' decisions to participate in carbon trading. This could include surveys or interviews to identify motivations and perceived barriers.

2.2 Longitudinal Impact Analysis: Investigate the long-term environmental and economic impacts of local carbon credit projects. This research could assess how participation in carbon trading affects community sustainability and local economies over time.

2.3 Technology and Innovation Research: Explore the potential of emerging technologies, such as blockchain or AI, in improving the efficiency, transparency, and verification of carbon credit transactions. This research could identify innovative solutions to enhance market credibility and participation.

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