GOVERNANCE AND LEGAL CONTEXT OF REGIONAL DEVELOPMENT COOPERATION BETWEEN THE PUBLIC AND PRIVATE SECTORS

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Abstract

This study investigated the factors influencing area development through public and private sector cooperation in Thailand's Central Northeast region, specifically in Kalasin, Khon Kaen, Maha Sarakham, and Roi Et provinces. Using confirmatory factor analysis (CFA) and structural equation modeling (SEM), the authors examined the impacts of an area development cooperation model (ADCM), characteristics of the area (CAR), and cooperation between agencies (CBA) on public-private participation (PPP) and the results of area development (RAD). The findings from 400 participants revealed that CAR and CBA significantly influence PPP (Miyake, 2023), with CBA showing the strongest direct effect. PPP, in turn, has a significant impact on RAD. Interestingly, ADCM had minimal direct influence on PPP, suggesting a more complex or indirect role. The study emphasizes the importance of area characteristics and inter-agency cooperation in fostering sector participation (Rado et al., 2021). The strong relationship between RAD and CBA (0.68) suggests that improving agency collaboration can significantly influence developmental outcomes. This research highlights the pivotal role of PPPs in achieving area development and provides valuable insights for policymakers aiming to enhance regional development through collaborative efforts.

Keywords: Agency Cooperation, Area Development, Public and Private Sector Participation, Regional Characteristics, Thailand

Authors' individual contribution: Conceptualization — P.S., W.S., and R.S.; Methodology — P.S. and R.S.; Software — P.S. and S.B.; Validation — S.S. and A.P.; Formal Analysis — P.S. and R.S.; Investigation — P.S. and S.S.; Resources — P.S. and W.S.; Data Curation — P.S.; Writing — Original Draft — P.S. and R.S.; Writing — Review & Editing — P.S., R.S., W.S., and S.S.; Visualization — P.S. and S.S.; Supervision — R.S. and S.B.; Project Administration — P.S. and R.S.

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1. INTRODUCTION

Collaborative governance involving multiple sectors is a model where various public agencies and private entities work together to achieve public service goals through innovative methods (van Gestel & Grotenbreg, 2021). This approach goes beyond the traditional top-down government operations, fostering partnerships among government organizations, businesses, and civil society to address complex social, economic, and political challenges (Rado et al., 2021; Vogel et al., 2022). The dynamic and interconnected nature of contemporary issues necessitates a cooperative effort across different sectors to achieve effective public administration (Djaja, 2018; Haefner, 2024; Hossain et al., 2020).

Central Thailand's Northeast region, specifically the provinces of Khon Kaen, Roi Et, Maha Sarakham, and Kalasin, faces unique regional challenges and needs (Puntub, 2021). According to various studies, factors affecting residents' happiness include household economic conditions, debt levels, money savings, self-esteem, and family and neighbor relationships (Ando et al., 2023; Hong-ngam et al., 2021). Despite these challenges, overall happiness levels are high, with 77.6% of residents reporting a high degree of satisfaction (Senasu, 2020).

Other studies have also emphasized the importance of multi-sectoral cooperation for effective area development (Miyake, 2023; Rado et al., 2021), with Klein (2020) stressing the need for shared goals and mutual trust in cross-sector collaborations in addressing public issues. Gash (2022) reviewed the conditions necessary for successful collaborative governance, including the importance of starting conditions, institutional design, and facilitative leadership. Thanapaet et al. (2023) added that effective public services need good governance, community stakeholder involvement, and cross-organizational collective leadership, while simultaneously enhancing social, economic, and political development values.

Grimsey and Lewis (2017) examined how public-private partnerships (PPPs) could be useful in infrastructure development and public transportation policy, emphasizing the benefits of shared responsibilities and resources. Siemiatycki (2009) discussed the importance of strategic planning and stakeholder engagement in real estate development, drawing on recent case studies from urban areas. This study underscores the significance of feasibility studies and strategic engagement in ensuring successful development projects.

Specific case studies further illustrate the effectiveness of these collaborative approaches. In Thailand, Srichamroen (2020) examined policies for promoting elderly health and highlighted the crucial role of Local Administrative Organizations (LAOs) as decentralized government entities. These organizations serve as the central hubs for networks within each sub-district across the country and function as essential mechanisms in implementing health promotion policies for the elderly, ensuring that these policies reach the smallest units of the community: individual older adults.

Given these insights, this research aims to investigate cooperative models for area development between the public and private sectors in Thailand's Central Northeast Region. The goal is to address development issues equitably, reduce social disparities, and enhance citizen engagement and private-sector participation. This study provides a framework for effective and inclusive development, ensuring all sectors contribute to the region's growth and stability.

Despite the documented successes of collaborative governance, there remain significant gaps in the literature regarding the specific mechanisms and outcomes of such approaches in regional contexts, particularly in Thailand's Central Northeast Region. Existing studies have not adequately addressed the unique socio-economic and infrastructural challenges faced by this region, nor have they provided a comprehensive framework for effective public-private cooperation tailored to local needs.

The theoretical framework for this study is rooted in collaborative governance theory, which emphasizes the importance of multi-sectoral cooperation, shared goals, and mutual trust among stakeholders. This framework is particularly relevant for addressing the complex and interconnected challenges faced by the Central Northeast Region, where traditional top-down approaches have proven insufficient.

The significance of this study lies in its potential to offer practical solutions for regional development, drawing on the strengths of both public and private sectors. By developing a comprehensive framework for collaborative governance, this research aims to provide actionable insights for policymakers, local governments, and private enterprises, thereby fostering sustainable and inclusive development practices.

The study aims to address the following research questions:

RQ1: How does the area development cooperation model (ADCM) influence public-private participation (PPP)?

RQ2: What is the impact of the characteristics of the area (CAR) on public-private participation (PPP)?

RQ3: How does the cooperation between agencies (CBA) affect public-private participation (PPP)?

RQ4: What is the relationship between public-private participation (PPP) and the results of area development (RAD)?

The research objectives are:

1) to evaluate the effect of the area development cooperation model (ADCM) on public-private participation (PPP).

2) to assess the impact of the characteristics of the area (CAR) on public-private participation (PPP).

3) to examine how the cooperation between agencies (CBA) influences public-private participation (PPP).

4) to determine the influence of public-private participation (PPP) on the results of area development (RAD).

This study employs a mixed-methods approach, combining qualitative and quantitative data collection and analysis. Key methodologies include:

Surveys and interviews: To gather detailed insights from stakeholders across various sectors,

including government officials, private sector representatives, and community leaders.

Case studies: To analyze successful examples of public-private cooperation within the region and identify best practices.

Data analysis: Using statistical methods to assess the impact of cooperative initiatives on development outcomes and to validate the proposed framework.

Preliminary findings suggest that successful public-private cooperation in the Central Northeast Region requires robust governance structures, active stakeholder engagement, and effective resource-sharing mechanisms. This study contributes to the broader discourse on regional development by providing a comprehensive framework that integrates these elements, offering a model for other regions facing similar challenges.

The rest of the paper is structured as follows. Section 2 reviews the relevant literature on collaborative governance, multi-sector cooperation, and public-private partnerships (PPPs). Section 3 analyzes the methodology used to conduct empirical research, including surveys, interviews, and case studies examining public-private cooperation in the Central Northeast Region. Section 4 presents the key findings of the research, highlighting the importance of stakeholder engagement and governance structures in achieving successful development outcomes. Section 5 presents a discussion of the findings, while Section 6 concludes with the study's contributions to the field and offers recommendations for policymakers and practitioners seeking to foster sustainable regional development.

2. LITERATURE REVIEW

2.1. Collaborative governance and multi-sectoral cooperation

Collaborative governance, where multiple sectors work together to achieve public service goals through innovative methods, is increasingly seen as essential for addressing contemporary challenges (Lopes & Farias, 2022). This approach transcends traditional top-down government operations, fostering partnerships among government organizations, businesses, and civil society to tackle complex social, economic, and political issues (van Gestel & Grotenbreg, 2021). Rado et al. (2021) and Vogel et al. (2022) emphasize the importance of these partnerships in creating more dynamic and responsive governance structures.

The necessity for collaborative efforts is driven by the interconnected nature of modern problems, which require cooperation across various sectors for effective public administration (Haefner, 2024). Nabatchi and Emerson (2021) examined the dynamics of collaborative governance, highlighting the significance of trust-building, power-sharing, and managing inter-organizational collaboration. Jaya et al. (2021) delve into the solutions to make interconnectedness viable through information transparency, data analysis, and information provision, which helps individuals quickly make informed decisions. These elements are crucial for the success of collaborative governance initiatives and have profound implications for policy and practice.

Multi-sectoral cooperation (MSC) has also been identified as a key factor for effective area development (Bryson et al., 2015; Lillefjell & Maass, 2021; Miyake, 2023; Rado et al., 2021). Calancie et al. (2021) reported on the critical importance of MSC in healthcare initiatives, while Klein (2020) indicated that increased collaboration across boundaries was needed to solve complex societal problems.

Therefore, the authors propose the following hypothesis for the study's model:

H1: The area development cooperation model (ADCM) directly influences public-private participation (PPP).

2.2. Regional challenges and development in Northeast Thailand

Central Thailand's Northeast region faces unique challenges that necessitate targeted development efforts (Prakongsri & Santiboon, 2021). Research indicates that residents' happiness in the Isaan Region is influenced by household economic conditions, debt levels, savings, self-esteem, and relationships with family and neighbors (Bureekhampun & Maneepun, 2021; Chaiyamart, 2020; Economic and Social Commission for Asia and the Pacific [ESCAP] & Asian and Pacific Training Centre for ICT for Development [APCICT], 2020; Hong-ngam et al., 2021).

In a 15-year study of Thailand's regional development, Lang et al. (2021) concluded that regional coordination was paramount in accomplishing sustainable urbanization. This is consistent with reporting from Hong Kong in which Lam and Yang (2020) noted that only 16% of urban area finance projects are able to go it alone without the assistance of private enterprise. Similarly, Cheng et al. (2021) stated that PPPs have become an innovative model that is becoming increasingly more important on a global scale.

In Southeast Asia, Tipayalai (2020) examined regional economic growth through the lens of international labor migration and concluded that due to the critical importance of highly skilled immigrants on regional growth, more attention should be paid to development policies. In Thailand's Khon Kaen City municipality, Laochankham et al. (2024) examined how business–government interactions determined the quantity and quality of public services and the ability of citizens to hold policymakers accountable for their performance. They concluded the study by saying that the true picture obscures the reality that Khon Kaen's business elite stand to capture a large share of the economic benefits from any PPP projects.

Therefore, the authors propose the following hypothesis for the study's model:

H2: Characteristics of the area (CAR) directly influence public-private participation (PPP).

2.3. Public-private partnerships and infrastructure development

PPPs have become a crucial mechanism for addressing infrastructure development needs in Thailand and Southeast Asia (Endo, 2024), especially in light of the region's rapid urbanization and economic growth. PPPs offer a collaborative model where both public and private sectors share responsibilities, risks, and benefits in delivering

essential infrastructure projects. These partnerships are widely used to develop large-scale projects, such as transportation (He, 2024), energy (Hossin et al., 2024), water supply, and telecommunication systems. Tools needed for PPPs now include artificial intelligence (AI), the Internet of Things (IoT), and Big Data Analytics (Nguyen et al., 2024; Prasad et al., 2024).

Geva and Siemiatycki (2024) underscored the importance of strategic planning and stakeholder engagement in real estate development, emphasizing the need for feasibility studies and strategic engagement to ensure successful projects. In Thailand. Moolngearn and Kraiwanit (2024) evaluated smart city development and suggested that technology adoption was necessary for improving services and enhancing life quality. The authors therefore suggest the use of AI, IoT, and Big Data Analytics are key elements.

Therefore, the authors propose the following hypothesis for the study's model:

H3: Cooperation between agencies (CBA) directly influences public-private participation (PPP).

2.4. Collaborative approaches in local governance

The role of collaborative approaches in local governance has gained increasing attention as a means to address complex and multifaceted challenges at the local level. Collaborative governance involves multiple stakeholders, including government agencies, private sector entities, and civil society organizations, working together to achieve common goals.

Healey (2020) explored collaborative planning in urban development, using case studies from European cities to illustrate how collaborative processes can lead to more inclusive and sustainable urban environments. The book highlights the importance of stakeholder engagement and the co-production of knowledge in achieving successful urban governance outcomes.

In the context of environmental management, Koontz and Thomas (2006) examined collaborative watershed partnerships in the United States. Their research shows that these partnerships often lead to improved environmental outcomes due to the pooling of resources, shared expertise, and the ability to address cross-jurisdictional issues more effectively but cautioned the need for change for change's sake.

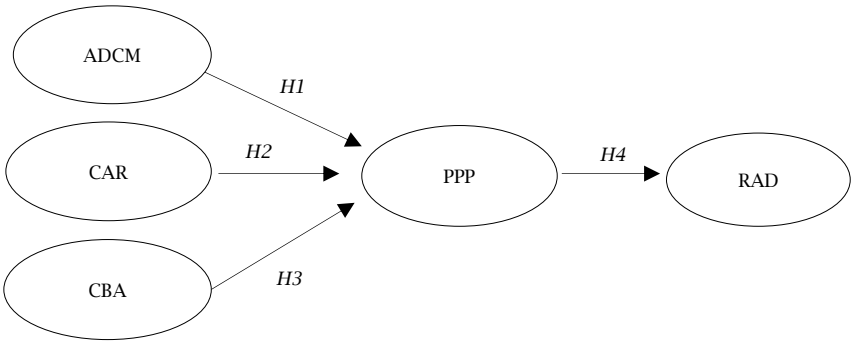
Research by Emerson et al. (2012) identified several critical factors that influence the success of collaborative governance initiatives. These include the presence of a skilled facilitator, the establishment of clear goals and roles, and the development of trust among participants. Their study emphasizes the need for adaptive management practices that can respond to changing conditions and emerging challenges. However, despite the potential benefits, collaborative governance is not without its challenges (Koontz & Thomas, 2006).

Other recent studies suggest innovative approaches to enhance collaborative governance. For example, Fung (2015) advocated for the use of participatory budgeting as a tool to engage citizens in local governance processes. This approach has been successfully implemented in various municipalities worldwide, leading to more transparent and accountable governance. In another example, Sørensen and Torfing (2016) explored the concept of "meta governance", where higher-level authorities provide frameworks and support for local collaborative efforts. This approach aims to balance the need for local autonomy with the benefits of coordinated governance.

Therefore, the authors propose the following hypothesis for the study's model:

H4: Public-private participation (PPP) directly influences the results of area development (RAD).

Figure 1. Conceptual model



Source: Authors' elaboration.

3. RESEARCH METHODOLOGY

3.1. Population and sample

The study's sample was obtained from the population of individuals aged 18 and above who were eligible to vote in fiscal year 2022 and resided in Thailand's Central Northeast Region. Table 1 shows the population and the corresponding sample size for each province in the Central Northeast region, ensuring a representative sample for the study.

Table 1. Population and sample distribution by provinces

Central Northeastern provinces	*Population*	*Sample size*
Roi Et	1,061,204	104
Khon Kaen	1,449,107	142
Maha Sarakham	790,346	77
Kalasin	792,054	77
Totals	4,092,711	400

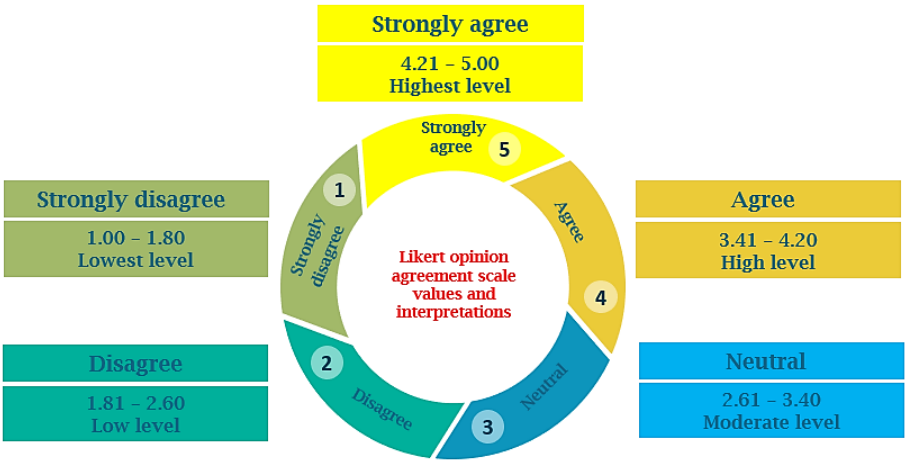
To determine the appropriate sample size, the authors followed the guidelines of Whittaker and Schumacker (2022) and Hair et al. (2020), which

suggest that the sample size should be 10–20 times the number of observed variables. Given that the study involved 22 observed variables, an appropriate sample size was determined to be between 220 and 440 participants. Therefore, the authors selected a sample size of 400 participants, ensuring it fell within this recommended range. Multistage random sampling was used to select the sample proportionally from each province and district, based on the population register of the Central Northeast Region.

3.2. Research tools

The research utilized a questionnaire to gather data on public service delivery by government agencies in Roi Et, Thailand. The questionnaire was divided into six sections with Sections 2–6 using a five-level Likert-type opinion scale (Sukkamart et al., 2023) (Figure 2).

Figure 2. Five-level Likert-type opinion scale



Source: Authors' elaboration.

Section 1 collected respondent characteristics: gender, education level, age, occupation, and residence. Section 2 gathered opinions on PPP in planning, decision-making, implementation, and evaluation. Section 3 focused on the RAD, covering social, political, economic, legal, environmental, information technology (IT), agriculture, utilities, communications, and transport aspects.

Section 4 explored opinions on the ADCM, including joint policy-making, resource sharing, and benefit sharing. Section 5 collected views on the CAR, focusing on population cooperation, area cooperation, and cooperation in lifestyle and culture. Finally, Section 6 examined CBA, involving cooperation among government, private, and social sectors.

Questionnaire reliability was established through a pilot test with 30 participants, whose responses were not included in the final survey (Pimdee, 2020). Cronbach's alpha values for sections 2–6 were 0.72, 0.73, 0.77, 0.77, and 0.89, respectively.

3.3. Data collection

The data was collected using the questionnaire targeting individuals aged 18 and above, eligible to vote in the 2022 fiscal year. The study focused on the cooperation in area development between public and private sectors in four provinces in Northeast Thailand. A team of research assistants conducted multistage random sampling across provinces and districts. Data collection took place from October to December 2022, achieving the desired sample size.

3.4. Data analysis

The study analyzed the accuracy of the structural equation modeling (SEM) and the impact between variables in the model using path analysis with latent variables. LISREL 9.10 software was employed to assess model fit based on established goodness-of-fit (GoF) criteria.

3.5. Alternative research methods

In addition to the multistage random sampling and questionnaire method used in this study, several alternative methodologies could be considered to achieve similar research objectives. The included qualitative interviews with key stakeholders, such as local government officials, community leaders, and residents, which could potentially provide in-depth insights into public service delivery and cooperation between public and private sectors. These interviews could be semi-structured to allow for flexibility while ensuring that all relevant topics are covered.

Focus groups could be conducted to gather diverse perspectives on public service delivery. By facilitating group discussions among different demographic groups, researchers could uncover nuanced views and collective opinions that may not emerge in individual interviews or surveys. Additionally, mixed-methods approaches combine quantitative surveys with qualitative methods, such as interviews or focus groups. This would allow for a comprehensive analysis, where quantitative data provides broad patterns and qualitative data offers detailed contextual understanding.

Secondary data analysis analyzes existing data from government reports, previous surveys, and academic studies, serving as an alternative or complement to primary data collection. This method could provide a broader context and validate findings from primary research. Case studies of specific provinces or districts within the Central Northeast Region could be conducted to provide detailed examinations of public service delivery and cooperation mechanisms. This method allows for an in-depth exploration of complex issues within a real-life context. An experimental design, such as a randomized controlled trial (RCT), could be employed to assess the impact of specific interventions on public service delivery. This method involves randomly assigning participants to treatment and control groups to evaluate causal effects.

4. RESULTS

4.1. Respondent demographics

The demographic characteristics of the survey respondents offer a detailed overview of the individuals participating in this study (Table 2). The survey respondents are almost evenly divided between genders, with males comprising 52.25% and females making up 47.75%. The age distribution of the respondents reveals a concentration in the 31–40 age group, which constitutes 32.50% of the sample. This is followed by the 41–50 age group at 24.50%, indicating that a significant portion of the respondents are in their prime working years. Younger respondents aged 18–30 account for 23.25% of the sample, while those aged 51 and above represent 19.75%. Educational attainment among the respondents showed that the largest group 41.50% had completed secondary education or an equivalent level. Primary education represented 24.25% of the respondents, while 23.25% possessed a bachelor's degree. A smaller segment, 11.00%, had attained a master's degree or higher.

The occupational data revealed that entrepreneurs and business owners formed the largest group, accounting for 28.75% of the sample, followed closely by government employees and state enterprise workers at 26.00%. Farmers made up 17.50% of the respondents, reflecting the agricultural nature of the region. Students constitute 14.25%, while laborers comprise 13.50% of the sample. The respondents' provincial distribution is varied, with the majority residing in Khon Kaen Province (35.50%). Roi Et Province followed with 26.00%, with both Maha Sarakham and Kalasin Provinces having equal representation, each contributing 19.25% of the sample.

Table 2. Survey participants' personal characteristics

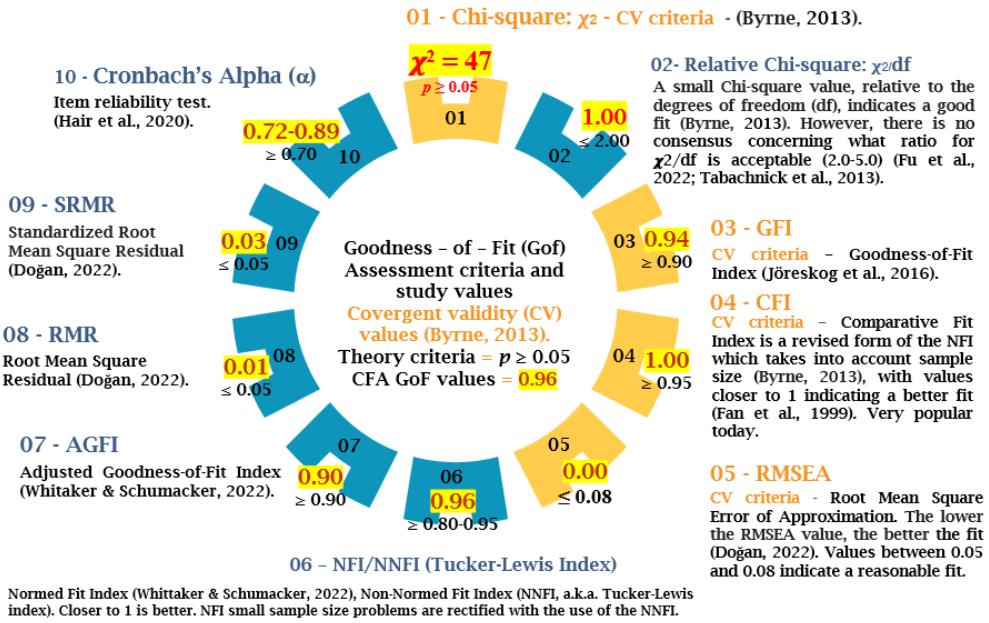
Survey item	*Respondents*	*%*
Gender		
Male	209	52.25
Female	191	47.75
Total	400	100.0
Respondent age		
18–30 years of age	93	23.25
31–40 years of age	130	32.50
41–50 years of age	98	24.50
51 years of age or older	79	19.75
Total	400	100.0
Education level		
Primary or equivalent	97	24.25
Secondary or equivalent	166	41.50
Bachelor's degree	93	23.25
Master's degree or higher	44	11.00
Total	400	100.0
Occupation		
Government or state enterprise employee	104.00	26.00
Entrepreneur/business owner	115.00	28.75
Laborer	54.00	13.50
Farmer	70.00	17.50
Student	57.00	14.25
Total	400	100.0
Province of residence		
Khon Kaen Province	142	35.50
Roi Et Province	104	26.00
Maha Sarakham Province	77	19.25
Kalasin Province	77	19.25
Total	400	100.0

4.2. Confirmatory factor analysis results

Figure 3 details the criteria, theory, and results from the LISREL 9.1 CFA (Petcharit et al., 2020).

It shows the values obtained from the LISREL 9.1 goodness-of-fit (GoF) analysis in yellow highlight. Beneath these study values, there are the values that are commonly suggested as acceptable from theory.

Figure 3. CFA GoF assessment wheel



Note: Values in yellow and red indicate the study's CFA results.
Source: Byrne (2013), Doğan (2022), Fan et al. (1999), Fu et al. (2022), Hair et al. (2020), Jöreskog et al. (2016), Tabachnick et al. (2013), Whittaker and Schumacker (2022).

4.3. Component analysis results

Table 3 details the results of the study's CFA including the latent and observed variable metrics. The seven columns detail the following:

1) Latent variables represent the main constructs or factors being analyzed.

2) Cronbach's alpha (α) is a measure of the reliability or internal consistency of the variable (Hair et al., 2020).

3) The average variance extracted (AVE) expresses the average amount of variance that a latent variable explains in its observed variables, indicating convergent validity.

4) Composite reliability (CR) measures the overall reliability of the latent variables, similar to Cronbach's alpha but more comprehensive.

5) Observed variables are the specific items or indicators measured to assess each latent variable.

6) Loading shows the factor loading which is the correlation between the latent and observed variables.

7) R^2, the coefficient of determination, represents the extent to which the variance in the observed variable is accounted for by the latent variable (Pimdee, 2021).

Key observations in Table 3 highlight the high validity and reliability of the variables:

ADCM: Demonstrates high reliability (α = 0.72) and validity (AVE = 0.74, CR = 0.89). The observed variable for shared resource utilization (x2) has a particularly strong loading of 0.95, indicating a strong correlation with ADCM.

CAR: Also shows high reliability (α = 0.77) and validity (AVE = 0.72, CR = 0.89). The observed variable for area cooperation (x5) has a loading of 0.95, reflecting a strong correlation with CAR.

CBA: Exhibits good reliability (α = 0.73) and validity (AVE = 0.72, CR = 0.88). The observed variable for private sector cooperation (x8) has a high loading of 0.93, indicating a strong correlation with CBA.

PPP: Shows good reliability (α = 0.78) and validity (AVE = 0.68, CR = 0.89). The observed variable for participation in implementation (y3) has a loading of 0.91, indicating a strong correlation with PPP.

RAD: Demonstrates high reliability (α = 0.89) and validity (CR = 0.91, though AVE = 0.52 is slightly lower but still acceptable). The highest loading is for utilities (y12) at 1.00, indicating a perfect correlation with RAD.

In summary, these findings affirm the strong reliability and validity of the measured variables, with specific observed variables showing particularly strong correlations with their respective latent constructs.

Table 3. Results of the CFA

Latent variables	*α*	*AVE*	*CR*	*Observed variables*	*Loading*	R^2
Area development cooperation model (*ADCM*)	0.72	0.74	0.89	Cooperation in joint policy-making (x1)	0.80	0.63
				Cooperation in shared resource utilization (x2)	0.95	0.91
				Cooperation in shared benefits (x3)	0.82	0.67
Characteristics of the area (*CAR*)	0.77	0.72	0.89	Population cooperation (x4)	0.77	0.59
				Area cooperation (x5)	0.95	0.90
				Cooperation on lifestyle and culture (x6)	0.82	0.67
Cooperation between agencies (*CBA*)	0.73	0.72	0.88	Government sector cooperation (x7)	0.79	0.63
				Private sector cooperation (x8)	0.93	0.87
				Social sector cooperation (x9)	0.81	0.65
Public-private participation (*PPP*)	0.78	0.68	0.89	Participation in thinking and planning (y1)	0.73	0.54
				Participation in decision-making (y2)	0.77	0.59
				Participation in implementation (y3)	0.91	0.83
				Participation in monitoring and evaluation (y4)	0.87	0.75
Results of area development (*RAD*)	0.89	0.52	0.91	Social aspect (y5)	0.65	0.43
				Political and governance aspect (y6)	0.71	0.51
				Economic aspect (y7)	0.66	0.44
				Legal aspect (y8)	0.67	0.44
				Natural resources and environment (y9)	0.69	0.48
				Information technology (y10)	0.57	0.32
				Agriculture (y11)	0.71	0.51
				Utilities (y12)	1.00	1.00
				Communications and transportation (y13)	0.75	0.57

4.4. Correlation coefficients between latent variables

Table 4 reports the correlation coefficients between various latent variables involved in the study. These coefficients are presented below the diagonal line, indicating the strength and direction of the relationships between the latent variables. The table also provides the mean, standard deviation (SD), skewness, and kurtosis for each variable. The "**" symbol indicates that these correlations are statistically significant at the 0.01 level, meaning there is a less than 1% probability that these correlations are due to chance.

Table 4. Latent variable correlation coefficients

Latent variables	*PPP*	*RAD*	*ADCM*	*CAR*	*CBA*
PPP	1.00				
RAD	0.69**	1.00			
ADCM	0.13**	0.14**	1.00		
CAR	0.47**	0.50**	0.13**	1.00	
CBA	0.58**	0.68**	0.14**	0.56**	1.00
Mean	4.10	4.11	4.20	4.12	4.10
SD	0.27	0.27	0.26	0.28	0.28
Skewness	0.05	-0.09	-0.47	-0.14	0.06
Kurtosis	0.23	-0.02	0.68	0.01	-0.32

*Note: ** Sig. ≤ 0.01.*

4.5. Descriptive statistics

The mean is the average score of responses for each latent variable, while the SD measures the dispersion of scores from the mean. The skewness indicates the asymmetry of the distribution of scores, with the kurtosis measuring the flatness or "peakedness" of the distribution of scores.

Therefore, understanding the correlation coefficients between latent variables is crucial for several reasons:

1) Relationship strength helps in understanding how strongly different aspects of the study are related to each other. For example, the high correlation between *PPP* and *RAD* (0.69) suggests a strong relationship between public and private sector participation and the results of area development.

2) Significance is the statistically significant correlations that indicate reliable relationships that are unlikely to be due to random chance, thus providing confidence in the study's findings.

3) Model validation uses high correlations, especially those that are statistically significant, to support the study's conceptual model validity.

4) Strategic Insights is done by identifying which variables are strongly correlated, so stakeholders can focus on the most impactful areas. For example, the strong correlation between *RAD* and *CBA* (0.68) suggests that improving cooperation between agencies can significantly influence the results of area development.

The means between 4.10 to 4.20 suggest generally high levels of agreement or positive responses across the latent variables.

Standard deviations (0.26 to 0.28) indicate relatively low variability in responses.

Skewness and kurtosis values close to zero suggest that the data distribution for each latent variable is approximately normal, which is beneficial for conducting further statistical analyses.

4.6. Analysis of standardized coefficients

Table 5 provides an analysis of the direct (DE), indirect (IE), and total effects (TE) of the latent variables on *PPP* and *RAD*. The table also includes key model fit indices to assess the SEM's adequacy.

The DE of the *ADCM* on *PPP* is 0.05, indicating a positive but modest influence. This implies that while the cooperation model for area development slightly enhances public and private sector participation, its impact is not substantial. There are no IEs or TEs reported for *ADCM* on *RAD*, suggesting that its influence is limited to PPP only.

The *CAR* was also shown to have a significant DE on *PPP*, with a coefficient of 0.27, demonstrating a strong positive impact. This suggests that favorable area characteristics significantly boost public and private sector participation. Additionally,

CAR has an IE on *RAD* through *PPP*, with an IE of 0.26, resulting in a TE of 0.26 on *RAD*. This indicates that *CAR* not only directly influences *PPP* but also indirectly contributes to the results of area development by enhancing PPP.

The *CBA* shows the highest DE on *PPP*, with a coefficient of 0.62, indicating a very strong positive impact. This highlights the critical role of inter-agency cooperation in fostering public and private sector participation. *CBA* also has a significant IE on *RAD* through *PPP*, with an IE of 0.61, leading to a TE of 0.61 on *RAD*. This underscores the importance of strong cooperation between agencies in achieving positive area development outcomes through its influence on PPP.

The DE of *PPP* on *RAD* is 0.99, indicating an almost perfect positive impact. This suggests that high levels of public and private sector participation are nearly synonymous with successful area development results. The total effect of *PPP* on *RAD* is also 0.99, as there is no IE reported, reinforcing the direct relationship between these variables.

The model fit indices shown previously in Figure 3 indicate an excellent fit of the SEM, providing confidence in the validity of the reported relationships and their respective DEs. The model fit indices further validate the SEM, with three of the four proposed hypotheses determined to be supported (Table 6 and Figure 4).

Table 5. Standardized coefficients of influence

Causal variables	*PPP*			*RAD*		
	DE	***IE***	***TE***	***DE***	***IE***	***TE***
ADCM	0.05	-	0.05	-	-	-
CAR	0.27**	-	0.27**	-	0.26*	0.26*
CBA	0.62**	-	0.62**	-	0.61**	0.61**
PPP	-	-	-	0.99**	-	0.99**
R^2		0.72			0.98	

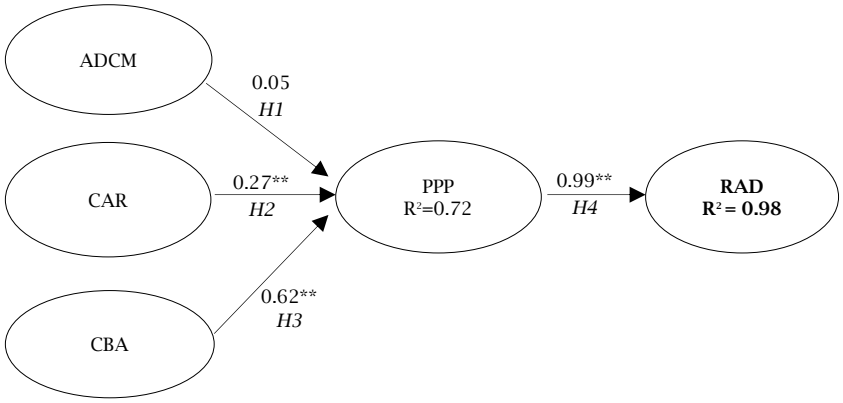
Note: χ^2 = 199.66, df = 199, RMR = 0.07, CFI = 1.00, GFI = 0.96, AGFI = 0.94, NFI = 0.96, RMSEA = 0.00.
** Sig. ≤ 0.05, ** Sig. ≤ 0.01.*

Table 6. Research hypothesis testing results

Hypotheses	***Coefficient***	***t-test***	***Results***
H1: The area development cooperation model (ADCM) directly influences public and private sector participation (PPP).	0.05	0.87	Inconsistent
H2: Characteristics of the area (CAR) directly influence public and private sector participation (PPP).	0.27	2.39*	Consistent
H3: Cooperation between agencies (CBA) directly influences public-private participation (PPP).	0.62	5.16**	Consistent
H4: Public-private participation (PPP) directly influences the results of area development (RAD).	0.99	7.71**	Consistent

*Note: * Sig. ≤ 0.05, ** Sig. ≤ 0.01.*

Figure 4. Final model



Note: χ^2 = 199.66, df = 199, p = 0.47, SRMR = 0.03, CFI = 1.00, GFI = 0.96, AGFI = 0.94, NFI = 0.96, RMSEA = 0.00.
Source: Authors' elaboration.

Table 7 shows the latent and observed variables analysis results, focusing on their means, SD, skewness, and kurtosis values. Understanding these metrics is essential as they provide insights into the distribution and central tendencies of the data, which in turn helps in interpreting the reliability and variability of the responses.

Table 7. Descriptive statistics analysis results

Latent/Observed variables	*Mean*	*SD*	*Skewness*	*Kurtosis*
Area development cooperation model (ADCM)	4.21	0.23	-0.672	0.999
Cooperation in joint policy-making (x1)	4.24	0.30	0.071	0.317
Cooperation in shared resource utilization (x2)	4.21	0.37	-0.721	0.649
Cooperation in shared benefits (x3)	4.18	0.31	-0.275	-0.102
Characteristics of the area (CAR)	4.12	0.27	-0.104	-0.051
Population cooperation (x4)	4.13	0.40	-0.343	0.070
Area cooperation (x5)	4.12	0.36	-0.110	-0.508
Cooperation on lifestyle and culture (x6)	4.10	0.36	-0.531	0.300
Cooperation between agencies (*CBA*)	4.12	0.26	0.036	-0.495
Government sector cooperation (x7)	4.16	0.34	-0.453	0.242
Private sector cooperation (x8)	4.13	0.33	-0.113	-0.278
Social sector cooperation (x9)	4.08	0.37	-0.021	-0.679
Public-private participation (PPP)	4.13	0.25	0.051	0.026
Participation in thinking and planning (y1)	4.14	0.39	-0.096	-0.097
Participation in decision-making (y2)	4.10	0.38	-0.047	0.182
Participation in implementation (y3)	4.16	0.31	-0.104	0.721
Participation in monitoring and evaluation (y4)	4.10	0.34	-0.175	0.001
Results of area development (RAD)	4.13	0.22	0.075	-0.101
Social aspect (y5)	4.10	0.33	-0.114	0.066
Political and governance aspect (y6)	4.14	0.34	-0.103	0.108
Economic aspect (y7)	4.18	0.36	-0.314	0.135
Legal aspect (y8)	4.11	0.33	-0.319	0.386
Natural resources and environment (y9)	4.15	0.30	-0.205	-0.112
Information technology (y10)	4.11	0.34	-0.059	-0.354
Agriculture (y11)	4.06	0.38	0.031	-0.277
Utilities (y12)	4.13	0.44	-0.135	0.685
Communications and transportation (y13)	4.17	0.31	-0.250	-0.100

Note: All responses were in strong agreement ('4' = 3.50 - 4.49) with the item.

5. DISCUSSION

5.1. Area development cooperation model

The high mean value of 4.21 indicates strong agreement among respondents regarding ADCM. The low SD of 0.23 suggests that responses are closely clustered around the mean, indicating high consistency. The negative skewness (-0.672) shows a slight skew towards higher agreement, while the positive kurtosis (0.999) indicates a distribution that is slightly more peaked than a normal distribution.

These results are consistent with Bryson et al. (2015) who provided updated case studies on the effectiveness of collaborative approaches in public administration and noted the complexities and challenges in their implementation. Similarly, Jutaviriya et al. (2022) noted the quickening pace of cross-border health support networks across the Mekong River between Laos and Thailand and their importance in socio-economic development.

5.2. Characteristics of the area

The mean of 4.12 shows strong agreement on CAR. The low SD of 0.27 indicates high consistency in responses. Near-zero skewness (-0.104) and kurtosis (-0.051) suggest a normal distribution.

5.3. Cooperation between agencies

The mean of 4.12 indicates strong agreement on CBA. The low SD of 0.26 suggests high consistency in responses. Skewness (0.036) and kurtosis (-0.495) are close to zero, indicating a fairly normal distribution.

5.4. Public-private participation

The mean value of 4.13 shows strong agreement on PPP. The low SD of 0.25 indicates high consistency in responses. Skewness (0.051) and kurtosis (0.026) values close to zero suggest a normal distribution.

These results are also in agreement with Ansell and Torfing (2021) who examined the role of cooperation between public, private, and civil society sectors in addressing regional security and development issues. Their results highlighted recent examples of collective action and resource pooling, demonstrating the effectiveness of multi-sectoral collaboration.

5.5. Results of area development

The mean value of 4.13 indicates strong agreement on RAD, while SD = 0.22 shows low variability. Additionally, skewness (0.075) and kurtosis (-0.101) values suggest a normal distribution.

Nguyen et al. (2021) highlighted the crucial role of effective governance and public administration in driving national economic growth and reducing poverty in Vietnam. Interestingly, their study found that at the provincial level, these practices had the most significant positive impact on the poorest populations.

6. CONCLUSION

The study provides a comprehensive understanding of the dynamics of cooperation in area development within Thailand's Central Northeast Region. The SEM results reveal that cooperation between agencies (CBA) and the characteristics of the area (CAR) significantly influence public-private participation (PPP), with standardized coefficients of 0.62 and 0.27, respectively. These relationships align with hypotheses *H2* and *H3*, supported by t-test values of 2.39 and 5.16, respectively. Notably, the direct influence of PPP on the results of area development (RAD) was exceptionally strong.

Conversely, the area development cooperation model (ADCM) had a negligible DE on PPP, with a coefficient of 0.05 and a non-significant t-test

value of 0.87, indicating inconsistency with hypothesis *H1*. This suggests that while structured cooperation models are essential, their direct impact may be less significant compared to the practical and contextual CAR and CBA.

The CFA results further support the strength of the latent variables, with high CR and AVE values across all constructs. For instance, the CR values for ADCM, CAR, CBA, PPP, and RAD were all above 0.88, indicating strong internal consistency and construct validity.

These findings have important implications for policymakers and development practitioners. By emphasizing the critical role of inter-agency cooperation and the specific characteristics of the area, stakeholders can tailor their strategies to foster more effective public-private participation. This approach not only enhances the efficiency of developmental initiatives but also ensures that the unique needs and potentials of different regions are adequately addressed.

The literature on collaborative approaches in local governance underscores the potential for these models to address complex local challenges effectively. By leveraging the strengths of diverse stakeholders, collaborative governance can lead to more sustainable, inclusive, and responsive outcomes. However, the success of these initiatives depends on various factors, including effective leadership, trust-building, and the ability to navigate the inherent challenges of collaboration. Future research should continue to explore innovative practices and the conditions under which collaborative governance can be most effective.

In summary, this study underscores the necessity of collaborative efforts and contextual understanding in achieving successful area development. The empirical evidence provided offers a solid foundation for developing policies and interventions that leverage cooperation between various sectors to drive regional growth and development. Further exploration into the nuanced interactions among these variables will enhance the applicability and impact of collaborative governance models in diverse settings.

This study, while insightful, is geographically limited to Thailand's Central Northeast region, potentially limiting generalizability. The reliance on survey data introduces biases and restricts the assessment of temporal changes. Constructs like the ADCM may not fully encapsulate the phenomena studied, and causal relationships remain challenging to establish definitively due to the cross-sectional design.

Future research should consider comparative studies across different regions and longitudinal analyses to examine the evolution of cooperation models over time. A mixed methods approach, integrating qualitative data, can provide a better understanding of cooperation dynamics. Additionally, exploring the influence of cultural factors, evaluating policy implementations, and investigating the role of technology in facilitating cooperation is crucial. Emphasizing broader stakeholder inclusion, particularly marginalized groups, will ensure that future models of collaborative governance and area development are more inclusive, equitable, and effective.

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