

The Spatial Economics Practices Dilemma in Affordable Housing Construction Units Project

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Abstract

The prevailing challenge of housing overhang poses a considerable obstacle for developers in the present day. This issue is rooted in the spatial economic strategies applied within a nation's housing market especially affordable scheme. The primary hurdle emerges from the situation were, despite intensive advertising endeavours, a segment of the existing housing inventory lacks appeal to potential buyers, leading to the surplus of unsold properties. This study aimed to uncover issues and remedies in spatial economic practices within housing construction units. In a nation poised for economic growth, providing suitable and affordable housing is crucial. Therefore, the objectives are follows; To identify the spatial economic practice problems in the affordable housing construction units, to identify the solution for spatial economic practice problems in the affordable housing construction units and to analyse the relationship between main spatial economic practice with main solutions for spatial economic practice problems in the affordable housing construction units. The study involves housing developers company operating in the state of Johor Bahru. A quantitative approach has been employed, utilizing online survey forms and physical meetings with a sample of 113 developer in Johor Baharu. 48% response rate from 54 analysed data set has been collected out of 115 sets of questions that have been distributed. Frequency analysis, descriptive statistics, and crosstabs has been used to accomplish the study's objectives. Upon completing the study, several objectives were successfully met. The primary main problem practice identified was the "Iterative reaction of agents on the observed situation". Concerning solutions, "Spatial Clustering Analysis" emerged main as the top choice Additionally, the main practice Iterative reaction of agents on the observed situation (lead to increased housing price) with main solution "Market study and survey (insight preference of potential homebuyers) is the strongest relationship". Ultimately, this research has provided valuable insights to developers regarding the main challenges and potential solutions for addressing the problem of housing overhang in affordable housing, considering the spatial

economics of homeownership. Framework development from this study can give guideline to uncover issues and remedies in spatial economic practices within housing construction units.

1. Introduction

Due to the current state of the economy, the issue of increasing costs for products, and other factors, the construction sector is perceived to be facing a number of issues. According to Glaeser & Gyourko (2003), there are numerous categories for housing, such as high, medium and low-income housing. For some individuals, starting with affordable housing which may be classified as being inexpensive in our country is the ideal way to begin house ownership. In Malaysia, home affordability is determined by one's financial capacity. However, housing is often out of reach for those living in impoverished countries (Olanrewaju *et al.*, 2016).

1.1 Research Background

As an instance, the number of housing units needed in Johor increased from 305,904 in 2016 to 327,829 in 2017 (Olanrewaju & Idrus, 2019), which (Ebekozien, Abdul-Aziz, & Jaafar, 2019) predicted would result in Malaysia seeing an unprecedented growth rate in urbanization over the next ten years. According to Sood *et al.* (2010), the idea of housing affordability evaluates socioeconomic and development settings. Due to the rising number of developers that launched and constructed homes on every available plot of land at a high price, the housing cost is a component in this overhang situation. As a consequence, there is an overhang of cheap housing and a property mismatch between supply and demand (Adzhar *et al.*, 2021). The research seeks to identify the factors influencing the affordable housing overhang issue in Johor, Malaysia.

1.2 Problem Statement

The problem of spatial economic practice is a common issue according to the cost of housing and travel is significantly influenced by location, particularly the distance between residential areas and employment hubs. discovered a connection between the significance of location and the property market. When a part of the housing stock is offered on the market but does not actually draw the attention of end users despite aggressive advertising for its occupancy, this is referred to as housing overhang (Ishak Yakub & Achu., 2019). Rahim *et al.* (2019) described it as a stock that is unable to supply the demand for affordable housing. Unsuitable location: Some of these cheap housing developments are located in undesirable areas because they are far from services and infrastructure, have distant workplaces, and are difficult to reach through roads and other modes of transportation. By providing empirical evidence on a variety of phenomena (socioeconomic deprivation, land price volatility, electoral competition, real estate market, firm survival, and tourism economics), and by utilising data at the municipality, firm, house, and even individual level, this special issue specifically contributes to the spatial economic alternatives. According to Zainon *et al.* (2017), spatial or location is a measure of how easily one may reach places like public transportation, the job, or schools and colleges. Due to the relatively cheap cost of land compared to desirable locations, most inexpensive housing developments have been built in unappealing geographic areas. In conclusion, the mismatch between the location of new launches and consumers' income is one of the causes influencing the overhang on affordable housing construction units (Ling *et al.*, 2017). Based on previous study by Ishak *et al.* (2019), Rahim *et al.* (2010), Zainon *et al.* (2017), prove that all issues in the spatial economic dilemma regarding to overhang problems among housing projects. Therefore, this study aims to analyse problems and solutions to the spatial economics practices in affordable housing construction project.

1.3 Research Questions

This investigation should to answer the following questions:

1. What are the spatial economic practice problems in the affordable housing construction units?
2. What are the solutions for spatial economic practice problems in the affordable housing construction units?
3. What the extend of the relationship between main spatial economic practice with the main solutions for spatial economic practice problems in the overhang of affordable housing construction units?

1.4 Research Objectives

After getting research questions, then the researcher can make research objectives to get what the purpose of this research. This research has three main objectives:

1. To identify the spatial economic practice problems in the affordable housing construction units.
2. To identify the solution for spatial economic practice problems in the affordable housing construction units.
3. To analyse the relationship between main spatial economic practice with the main solutions for spatial economics practices problems in the affordable housing construction units.

1.5 Research Hypothesis

Those are the research hypothesis:

H0: There are no significant relationship between spatial economic practice problems with it's solutions for affordable housing construction units.

H1: There are significant relationship between spatial economic practice problems with it's solutions for affordable housing construction units.

1.6 Research Scope

Learning about the spatial economics of overhang construction units offers a rare chance to comprehend the social, economic, and environmental facets of urban development. It can create more sustainable and habitable cities by making significant contributions to urban planning, real estate, infrastructure, energy efficiency, and policy development (Murphy, 2012). The number of 2-3 story semi-detached residential property overhang in Johor Bahru merely decreased somewhat from 378 units in 2019 to 313 units in 2020 (Tey & Kassim, 2022). This is even though the government has announced several housing incentives. Johor is the second-most populated state in Malaysia, with a total area of 1,898.676 hectares and a population of 3,230,440 in 2010. The state, which includes the districts of Kota Tinggi, Ledang, Mersing, Segamat, Batu Pahat, Muar, Pontian, Kulai Jaya, Johor Bharu, and Kluang, is the third-largest conurbation in Malaysia.

1.7 Significances of Study

Research into project management practices aimed at mitigating the issue of overhang in affordable housing in Malaysia holds paramount importance. This study serves various key stakeholders. For top management in construction firms, it offers a means to continually enhance company performance and safeguard the company's reputation by steering clear of overhang scenarios, thereby reaping multifaceted benefits. Developers can benefit significantly by using this research to assess project feasibility against the economic backdrop, avoiding substantial losses. Additionally, for students and educators, this research provides a valuable reference for future endeavors, fostering a deeper comprehension of the correlation between economic factors and the challenge of overhang in affordable housing development. Such insights pave the way for new knowledge and understanding in this critical domain.

2. Literature Review

Spatial economics, also referred to as regional economics or geographical economics, is an economic discipline that concentrates on the spatial aspects of economic activities. It investigates how factors like geographic location, transportation expenses, agglomeration effects, and regional policies impact the distribution of economic activities, productivity levels, and overall development across diverse regions. It addresses questions concerning regional inequalities, regional growth and progress, urbanization, rural-urban migration, land utilization patterns, and the effects of regional policies on economic results (Fujita *et al.*, 1999).

2.1 Definition of Spatial Economic

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2.2 Definition of Affordable Housing

The discussion surrounding affordable housing involves concerns regarding both its affordability and physical conditions, leading to the assertion that occupants of affordable housing face higher expenses compared to those living in traditional housing. These expenses can be monetary, such as increased commuting costs, or non-financial, like the risk of exposure to crime. Essentially, the argument suggests the presence of "hidden costs" that occupants of affordable housing encounter, but these costs are not factored into our conventional methods of measuring housing affordability. If these hidden costs were taken into account, it would reveal that housing is less affordable than currently perceived, as there are additional expenses that are being overlooked (Pivo, 2013).

2.3 Spatial Economic Practise Problems in the affordable housing construction units

(a) Location Changes

In the context of affordable housing construction units, the observation regarding location choice in housing development is relevant to the spatial economic practice problem. Affordable housing developers face challenges in selecting favorable locations for their projects that not only meet the affordability criteria but also offer desirable living conditions and access to amenities. The traditional optimization approach mentioned in the paragraph suggests that businesses, including affordable housing developers, should ideally relocate from inferior to superior locations. In the context of affordable housing, this means selecting locations that provide a conducive environment for residents, such as proximity to employment opportunities, public transportation, schools, healthcare facilities, and other essential amenities. The traditional optimization approach mentioned in the paragraph suggests that businesses, including affordable housing developers, should ideally relocate from inferior to superior locations. In the context of affordable housing, this means selecting locations that provide a conducive environment for residents, such as proximity to employment opportunities, public transportation, schools, healthcare facilities, and other essential amenities (Kopczewska, Kopyt, & Ćwiakowski, 2021).

(b) Urban Agglomeration Effects

Urban agglomeration effects refer to the positive externalities and benefits that arise from the concentration of economic activities and population in urban areas. However, in the context of affordable housing, understanding the relationship between housing and urban agglomeration becomes crucial. Affordable housing developers need to consider how the location and distribution of housing units within an urban area can influence and benefit from agglomeration effects. Agglomeration forces are among the well-established drivers of location changes. The existence of agglomeration in urban economies is assumed to result from the endogenous co-evolution of industries and local formal and informal institutions, specific to certain industries and places (Kopczewska, Kopyt, & Ćwiakowski, 2021).

(c) Economic of Density

The examination of economic density variables is important for understanding how population and infrastructure densities impact economic growth. In the case of affordable housing, the spatial distribution of housing units within an area can influence economic dynamics and development. Higher population densities can create economies of scale, enhance productivity, and facilitate the provision of infrastructure and services. Developers can use gravity models to understand the spatial interaction patterns and determine optimal locations for affordable housing construction (Yegorov, 2005). Population density also plays a significant role in societies that rely on agriculture and natural resources. Excessively high population density reduces the per capita availability of natural resources but facilitates infrastructure development, thereby establishing an optimal population density for economic growth (Yegorov, 2005).

(d) Spatial Interactions

Spatial interaction, which involves the movement of people, resources, information, and commodities between regions, plays a significant role in understanding the spatial dynamics of affordable housing. Spatial interactions are influenced by the settlement network, which represents human activity, the natural landscape, which is a critical element of the natural system, and the dynamic zones of economic activities, which encompass essential attributes of both human and natural systems (Yiannakou, Eppas & Zeka, 2017).

(e) Spatial Externalities

Positive spatial externalities in affordable housing construction can include benefits such as improved neighborhood aesthetics, increased social cohesion, and enhanced property values in the surrounding area.

Housing externalities have significant implications for the investment decisions of individuals. Understanding the direction of this effect is a major challenge in comprehending these externalities, specifically in housing markets. Developers, policymakers, and community stakeholders must assess and balance the positive and negative impacts of affordable housing construction on the surrounding area (Surya *et al.*, 2021).

(f) Iterative Reaction of Agents On The Observed Situation

The affordable housing sector present of feedback loops and interdependence among agents suggests that changes in one area or segment can have ripple effects on others. For example, the entry of a new affordable housing development in a specific neighborhood may impact property values, rental prices, and housing demand in the surrounding area. By considering joint distributions and various fields describing the property and its listing status, stakeholders can gain insights into the market conditions, pricing strategies, and buyer behavior in the affordable housing sector. This data can provide valuable insights into market trends, buyer preferences, and the effectiveness of affordable housing policies and interventions (Ma, Tey & Xiao, 2019).

2.4 Solutions for spatial economic practice problems in the affordable housing construction units.

(a) Using Geographic Information System (GIS)

The solutions for addressing spatial economic practice problems in affordable housing construction is to enhance the understanding of the impact of location on property value using a Geographic Information System (GIS). The traditional comparison technique used for property valuation can be enhanced by explicitly considering geographic influences on value. This means incorporating spatial analysis techniques and tools to identify and quantify the specific impacts of location on property value. Developers can use intelligent tools and interfaces to conduct spatial analysis, compare different affordable housing units with similar physical attributes, and identify the variations in value that can be attributed to locational factors. Land use changes in peri-urban areas are complex and dynamic, involving interactions between natural and human systems. Geographical Information System (GIS) can effectively monitor and evaluate these dynamic changes, detect trends of urban expansion, and predict future growth patterns (Samat, Hasni & Elhadry, 2011).

(b) Hedonic Price Analysis

Hedonic price analysis models consider various factors that affect the price of affordable housing, including both property specific characteristics and neighborhood or spatial externalities. The contemporary hedonic models encompass a wide range of economic factors, such as income and price relations, government tax policies, and intrinsic property characteristics. This knowledge contributes to addressing spatial economic practice problems by optimizing the design and positioning of affordable housing units (Kopczewska, Kopyt, & Cwiakowski, 2021).

(c) Accessibilities Analysis

Accessibility analysis refers to the ease with which individuals can access various activities or services from a specific location, taking into account the transportation system in place. By considering accessibility in the planning and development of affordable housing units, developers can enhance the quality of life for residents and promote economic opportunities. In the context of affordable housing, accessibility analysis means ensuring that residents have convenient access to essential services, such as schools, healthcare facilities, employment centers, public transportation, and commercial areas. Typically, accessibility is measured in terms of travel distance, time, or cost. The less time and money required for travel, the greater the number of activities that can be reached within a given timeframe, resulting in higher accessibility (Liu & Zhu, 2004).

(d) Spatial Clustering Analysis

Spatial clustering analysis helps in exploring and understanding spatially referenced data, which can be valuable for identifying patterns, trends, and relationships relevant to affordable housing development. In the context of affordable housing construction, this research can help developers and policymakers identify appropriate clustering methods that effectively group housing units based on spatial attributes, such as location, amenities, accessibility, and socioeconomic factors. The dynamics of the housing market have profound effects on neighborhood regeneration, local and regional development, and the stability of national and international economic systems. The structure and functioning of the market influence housing accessibility, the distribution of wealth through property values, and are major drivers of social and spatial segregation. This can be a guide the development of software or tools that support the clustering and analysis of affordable housing data, making it easier for stakeholders to identify clusters and patterns that can inform decision-making processes (Murray, 1999).

(e) Land Use And Zoning Analysis

The spatial economic practice problems in affordable housing construction is through land use and zoning analysis. Through land use and zoning analysis, policymakers can identify suitable areas for affordable housing construction, considering factors such as infrastructure, transportation accessibility, and environmental impact. The presence of vacant and abandoned land in many cities due to industrial restructuring presents an opportunity for urban regeneration. Governments prioritize encouraging new housing development on "brownfield" sites, which are previously developed areas. Land use and zoning analysis, combined with government policies and regulations, enable the identification of suitable areas for affordable housing construction. Additionally, the focus on urban regeneration and the utilization of brownfield sites contributes to sustainable development, reduces environmental impact, and promotes efficient land use. Zoning decisions by the government can influence the supply of land available for specific uses. The resulting change in property value due to zoning is referred to as the option value, which can be positive or negative. To effectively address changes in option value, good governance requires a clear understanding of how land use zoning specifically affects the option value of properties and to what extent (Jonathan, 2004).

(f) Market Studies And Survey

The importance of understanding housing markets and their segmentation to inform decision making in the construction of affordable housing. Traditionally, housing submarkets are identified based on specific geographic areas where the price per unit of housing quantity, determined by certain housing characteristics, remains consistent. However, a different approach by defining housing markets as geographic areas where the price of housing per unit of service remains constant, and where individual housing characteristics can be purchased. This approach provides a more comprehensive understanding of housing markets and allows for a deeper analysis of housing affordability and accessibility (Goodman & Thibodeau, 1998).

2.5 Relationship Between the spatial economic practise with the solution for spatial economic practice problems in the affordable housing construction units.

The provision of affordable housing is rapidly developing, but there is a crisis due to a mismatch between demand and supply in the residential market. This has led to an increase in the number of unsold residential units. The allocation of national housing in Malaysia has undergone several changes aligned with economic development restructuring, urbanization, population growth, and migration since the era of independence.

According to Zhang *et al.*, (2022), Spatial economic practice involves understanding the spatial dynamics and interactions between various elements in an urban environment, including the distribution of affordable housing, public services, and facilities. The spatial mismatch between affordable housing neighborhoods and public services/facilities, which results in a reduced well-being for low-income residents and contributes to spatial injustice. The housing issue poses significant challenges and has social repercussions if not properly addressed. Despite the introduction of numerous affordable housing programs to increase the supply, the issue of affordable housing persists. The slow market trends have resulted in an increasing number of unsold units, including affordable housing units. It is crucial to conduct an in-depth analysis to address these problems; otherwise, the unsold units will exert pressure on prices and rentals in the market, leading to future impacts (Rahim *et al.*, 2019).

3. Research Methodology

3.1 Research Design

A research design can be developed by employing the methodologies outlined in process research. The aim of a research design is to define data based on gathered information. The initial steps in any research project involve gathering and analyzing data. In order to obtain data, it is appropriate to utilize quantitative methods, which rely on a questionnaire. This research is focus on assessing the level of project management among selected housing developers in Johor Baharu. Various question structures will be employed to administer the questionnaire, and the research questions will be addressed through the use of questionnaires. The data will be analyzed using the Statistical Package for the Social Sciences (SPSS). SPSS is a tool designed for processing and analyzing data, providing statistical analysis capabilities and a graphical environment.

3.2 Procedure of Research

3.2.1 First Phase

The first phase involves the researcher's task of identifying the problem statement associated with the research topic by examining journals, articles, theses, the Internet, and books. The problem statement reflects the current issue pertaining to the research topic. By analyzing the identified problem, the researcher establishes the research objectives for the subsequent phase. This study led to the formulation and determination of three research objectives, as well as the specification of the study's scope. The research question is developed during the early stage of the research to further reinforce the research objectives. Concurrently, the researcher engages in discussions with supervisors to gather perspectives, suggestions, and ideas for the ongoing research.

3.2.2 Second phase

The second phase of the research is known as the literature review, which involves the systematic exploration, assessment, and synthesis of scholarly material pertaining to a specific subject. Its objective is to condense, combine, and scrutinize the perspectives of others. A literature review represents a meticulous evaluation of existing research, with implications for ongoing work. Conducting a literature review is a crucial and foundational undertaking for researchers, enabling them to gain a comprehensive understanding of the current knowledge in their respective fields of study.

3.2.3 Third Phase

The third phase of this research project is centered around collecting data to fulfil the research objectives. The utilization of a questionnaire is the primary method employed to attain these goals. In order to gather the necessary data, a stratified random sampling approach was adopted, targeting 113 housing developers companies located in Johor Baharu. The questionnaire was distributed among these selected companies, facilitating the acquisition of relevant information.

3.2.3.1 Primary Data

Primary sources are fundamental in research as they provide the authentic documents or artifacts that serve as the foundation for further investigation. They enable scholars to gain a close understanding of the actual occurrences during the specific time under study. To achieve the three objectives outlined in the research, a questionnaire was deemed suitable.

3.2.3.2 Secondary Data

Secondary sources play a crucial role in research by analyzing and presenting information or discoveries initially mentioned in primary sources. These secondary sources interpret, explain, or summarize the original material, thereby influencing the reader's understanding. For instance, articles published in journals or magazines often review or analyze the findings of previous studies.

3.2.4 Fourth phase

During this stage, the researcher must analyze the data obtained from primary sources, as it is crucial for the final investigation. Various analytical approaches can be employed for data analysis. In this study, a primary quantitative method involved administering a questionnaire to 113 housing developer companies in Johor. The survey was distributed through multiple channels, including email, WhatsApp, Telegram, and face-to-face interactions. To quantitatively compute the minimum and maximum percentages, the Statistical Package for the Social Sciences (SPSS) was utilized.

3.2.5 Fifth phase

The fifth phase is the final phase. This phase will involves presenting the findings and drawing conclusions. Once the data analysis has been conducted, the researcher is tasked with interpreting the results and deriving meaningful insights. In this study, data collected from the survey participants will be subjected to analysis using statistical software like SPSS and Cross Tabulations.

3.3 Respondent

3.3.1 Population Size

A population refers to a defined entity or a collective of individuals who possess specific shared characteristics. In the field of statistics, a population serves as the target group from which a statistical sample is drawn for research purposes. Essentially, any group of individuals who exhibit common traits can be regarded as a population. In the context of this research, the focus is on housing project registered with the Ministry of Local Government

Development in Johor. According to current data from Ministry of Local Government Development (2023), the total number of developer is about 170 developers.

3.3.2 Sample size

In the field of research, the term "sample size" refers to the number of individuals included in a study. It represents the total count of participants involved in the research. Typically, this number is further divided into subgroups based on factors such as age, gender, and location. The overall sample size is generally representative of the larger population. The determination of sample size can be achieved using the method developed by Krejcie and Morgan, utilizing population (N) and sample (S) values. In the present study, the population refers to the number of housing projects constructed by developers, specifically consisting of 170 developer in Johor according to the Ministry of Local Government Development (KPKT). Therefore, following the guidelines of Krejcie and Morgan, the sample size for this study was determined to be 113 developer.

3.4 Research method

3.4.1 Questionnaire form

A questionnaire is a specific instrument or tool for collecting data. Each section of the questionnaire is denoted by letters A, B, or C. The questions included in each section will vary depending on the information provided by the respondents. The questionnaire form can be found in the Appendix for reference. The overarching research question revolves around the means of achieving the desired end goal. The sections of the questionnaire can be categorized as follows:

Section A: Respondents Background.

Section B: Spatial economic practice problem in the affordable housing construction units.

Section C: Solution for spatial economic practice problems in the affordable housing construction units. Refer to appendix for questionnaire form draft.

3.4.2 Likert Scale

The survey results are presented using Likert scales, which allow for the quantification of attitudes based on a set of statements and response options. Likert scales typically offer a range of five to seven possible answers, spanning from "Strongly Agree" to "Strongly Disagree." This comprehensive range of responses enables survey creators to gain a thorough understanding of respondents' perspectives and the level of agreement among them. Additionally, Likert scale questions include a neutral response option to accommodate those who may be undecided on the matter being assessed.

3.5 Pilot study

A pilot study refers to a small-scale investigation conducted to assess different aspects of planned approaches in preparation for larger, more rigorous, or confirmatory studies. As defined by Hassan, Schattner & Mazza (2006), a pilot study is a preliminary research activity that aims to test research protocols, data collection tools, sample recruitment strategies, and other study techniques before conducting larger-scale investigations. To ensure the relevance, practicality, and alignment with the research objectives, a questionnaire will be utilized. The sample size for the pilot study phase will consist of 10 respondents, as it is a flexible number that allows for obtaining valuable initial feedback, as suggested by Bullen (2021).

3.5.1 Reliability analysis

The reliability analysis employed Cronbach's Alpha to assess the scale's reliability. Cronbach's Alpha is a statistical measure ranging from 0.0 to 1.0, where a value closer to 1.0 indicates higher reliability in the variance of test scores. Conversely, a value of 0.0 signifies the absence of reliable variance (Connelly, 2011).

Table 1: Reliability Test

Number of Questions	Number of Respondents	Alpha Cronbach's Value
57	5	0.952

3.6 Data analysis

3.6.1 Descriptive analysis

Descriptive analysis involves three key steps: data gathering, data cleaning, and the application of analytical methods. In this study, participants were asked to complete questionnaires that included measures of central tendency. Central tendency measures, such as the mean, median, and mode, are used to assess the average value of the data. In this particular study, the researchers focused solely on the mean as a descriptive analysis measure. Descriptive statistics serve as a powerful tool for distilling and summarizing large datasets, helping to reduce the complexity of the information (Zikmund *et al.*, 2003).

3.6.2 Cross Tabulations

Employing cross-tabulations is particularly suitable for the third objective as it facilitates the examination of relationships within the data that may not be immediately apparent. Cross-tabulations serve as a valuable quantitative research technique in survey analysis, enabling researchers to explore correlations and relationships between two or more variables. By comparing and analyzing data for one or more variables using cross-tabulations, researchers can uncover insights into their interdependencies. Performing cross-tabulations requires only a minimal amount of data, allowing researchers to input either a single variable or a collection of variables as the axes. As a result, the generated table will have rows and columns corresponding to the codes assigned to each axis (Kamakura *et al.*, 1997).

4. Result and Discussion

The results and discussion section presents data and analysis of the study. A total of 118 sets of questionnaires were distributed to the respondents. In the 113, a total of 54 sets of questionnaires were returned with answers and all of the returned questionnaires were used for data analysis purposes. As a result, the study's response rate is 48%. A power analysis is a popular method for figuring out the minimum sample size needed to find a significant effect or difference of roughly 30% of respondents (Serdar *et al.*, 2021). Therefore, response rate 48% that respondent feedback from this research is valid to implement data analysis process.

(a) Section A: The Background of Respondents

The section describes the sample characteristics of the typical respondents and encloses the general pattern of the responses. Besides, the table of summary of the data analysis in Section A had shown in Table 2. the percentage of the male respondent is higher than female respondents with a total percentage of 68.5% with a total of respondents. The percentage for age for between 30 to 40 years old is the highest, with 68.5 % equal to 37 respondents. Next, the highest percentage for race is Malay with 53 respondent equal to 98.1%. Furthermore, the highest qualifications for degree are the highest, with 92.6% and 50 respondents. Next, the highest percentage for years of service in the construction industry is between 6 to 10 years with 37% and a total of 20 respondents. The percentage for job title for project manager is the highest, with 33.3% equal to 18 respondents. The highest for the type of housing project is terrace house, semi-detached & bungalow with 23 respondent equal to 42.6% and for the last, the highest number of housing price category is high and medium with 53.7% equal to 29 respondent.

Table 2 Summary of Data Analysis in Section A

No.	Respondents Background	Frequency	Percentage (%)
1.	Gender		
	Male.	37	68.5
	Female.	17	31.5

2. Age		
Between 18-29 years old.	16	29.6
Between 30-49 years old.	37	68.5
Between 50-59 years old.	1	1.9
60 years old and above.	0	0
3. Race		
Malay.	53	98.1
Chinese.	1	1.9
Indian.	0	0
Others.	0	0
4. Highest Qualification		
Primary/secondary.	0	0
Diploma.	1	1.9
Degree.	50	92.6
Masters/Ph.D.	3	5.6
5. Year of Services In The Construction Industries		
Between 1-5 years.	17	31.5
Between 6-10 years.	20	37
Between 11-20 years.	15	27.8
Between 21 years and above.	2	3.7
6. Job Title		
Project Manager.	18	33.3
Architecture.	0	0
Valuer.	11	20.4
Property Manager.	2	3.7
Town planner.	0	0
Quantity Surveyor.	8	14.8
Other.	15	27.8
7. Type Of Housing Project		
Terrace House.	1	1.9
Terrace House & Semi-Detached.	13	24.1
Terrace House, Semi-Detached & Bungalow.	23	42.6
Terrace House, Semi-Detached, Bungalow & Condominium.	2	3.7
Terrace House, Semi-Detached, Bungalow, Condominium & Apartment.	5	9.3
Terrace House, Semi-Detached, Bungalow & Apartment.	7	13
Terrace House, Semi-Detached, Bungalow & Apartment.	1	1.9
Terrace house & Bungalow.	1	1.9
Semi Detached & Bungalow. Bungalow	1	1.9
8. Housing Price Category		
High & Medium.	29	53.7
High, Medium & Low.	14	25.9
Medium.	4	7.4
Medium & Low.	7	13

(b) Section B : The Spatial Economic Practice Problems In The Housing Construction Units. (Objective 1)

Based on Table 3, the mean average score is categorized and interpreted into three levels. A mean score of 1.00 to 2.33 refers to a low mean value, a score of 2.34 to 3.66 is a mean value at a moderate level and a mean score of 3.67 to 5.00 indicates a mean value at a high level.

Table 3 Assessment Level Based on Mean Score (Ibrahim,2013)

Mean Score Range	Score	Mean Score Level
1.00-2.33	Low	(Not Agree/ Not Helpful/ Unsatisfied/ None/ Sometimes/ Not Sure)

2.34-3.66	Moderate	(Agree/ Helpful/ Satisfied)
3.67-5.00	High	(Strongly Agree/ Fully Satisfied/ Really Helpful)

Based on Table 4, the majority of respondents achieved high agreement level (refer Table 3) that the spatial economic practice problems in the housing construction units. There are five in total for problems of this summary. Mean, Agreement Level and Ranking are the types that must be concluded in summary. The highest ranking is Iterative reaction of agents on the observed situation with the highest mean of 4.0334, and a high agreement level. 2nd in ranking is Effecting In Spatial Interaction with a mean of 4.0092 and a high agreement level. Next, ranking for 3rd is Effecting In Spatial Externalities with a mean of 3.9630 and an agreement level high. 4th in ranking is Lead To Agglomeration Effects with a mean of 3.9568, and the last is 5th in ranking is Effecting In Location Changes with a mean of 3.9262.

Table 4 Mean Analysis of The Spatial Economic Practice Problems In The Housing Construction Units

The spatial economic practice problems in the housing construction units	Mean	Agreement Level	Ranking
Effecting In Location Changes	3.9262	High	5
1 Increasing housing price.	4.0930	High	1
2 Change in neighborhood character.	3.3700	Moderate	5
3 Stimulate local economic growth.	4.0930	High	1
4 Buyers affordability will decreased.	4.0190	High	4
5 Developer can't reach target market.	4.0560	High	3
Lead To Agglomeration Effects	3.9568	High	4
1 Decrease economic productivity.	3.9630	High	2
2 Decrease innovation.	3.8520	High	9
3 Decrease social interaction.	3.9260	High	7
4 Limit the knowledge spill over.	3.9630	High	2
5 Investment by investor will decrease.	3.9260	High	7
6 Decrease employment opportunities.	4.0000	High	2
7 Lead to housing affordable issues.	4.0000	High	2
8 Decrease congestion.	4.0190	High	1
9 Decrease strain public services.	3.9630	High	2
Effecting In Spatial Interaction	4.0092	High	2
1 Imbalance in housing supply.	4.0370	High	1
2 Buyer's interest will decreased.	4.0000	High	3
3 Limit access to housing facilities.	3.9630	High	4
4 Lead to increased traffic congestion.	4.0370	High	1
Effecting In Spatial Externalities	3.9630	High	3
1 Decrease the government facilities.	3.9260	High	4
2 Increase costs of housing development.	4.0000	High	1
3 Decrease the local infrastructure development.	3.9630	High	2
4 Decrease public services development.	3.9630	High	2
Iterative reaction of agents on the observed situation	4.0334	High	1
1 Lead to increase housing price.	4.0930	High	1
2 Unstable of housing market.	4.0370	High	2
3 Investor will be not confidents.	3.9810	High	5
4 Limited access to construction resources.	4.0370	High	2
5 Limited access to public amenities.	4.0190	High	4

Based on the research analysis, the issues within spatial economic operations in housing construction entities represent a repetitive response by involved parties to the most significant observed situation, scoring a highest mean value of 4.0334. Consequently, these issues within spatial economic operations in housing construction persist due to agent reactions. Conversely, the least mean value, 3.9262, pertains to problems impacting location alterations. Thus, these findings fulfil the primary aim of recognizing the core issues within spatial economic practices in housing construction units. As outlined with (Ma, Tey & Xiao, 2019), examining combined distributions and diverse property-related fields enables stakeholders to comprehend market conditions, pricing

tactics, and buyer tendencies within the housing sector. Detailed data, including property attributes, listing records, and transaction specifics like final prices and buyer representation, play a pivotal role in grasping spatial connections in the housing market. This information yields significant insights into market patterns, buyer inclinations, and the efficacy of housing policies and interventions.

(c) Section C: Solution of spatial economic practice problems in the affordable housing construction units (Objective 2)

Based on Table 5, the majority of respondents achieved high agreement level (refer Table 3) that the solutions of spatial economic practice problems in the housing construction units. There are six in total for problems of this summary. Mean, Agreement Level and Ranking are the types that must be concluded in summary. The highest ranking is **Spatial Clustering Analysis** with the highest mean of 4.1428, and a high agreement level. 2nd in ranking is **Using Geographic Information System (GIS)** with a mean of 4.1298 and a high agreement level. Next, ranking for 3rd is **Market Study and Survey** with a mean of 4.1157 and an agreement level high. 4th in ranking is **Hedonic Price Analysis** with a mean of 4.1076. The 5th in ranking is **Land Used and Zoning Analysis** with a mean of 4.1002 and 'high' agreement level and the last in the ranking in number 6th is **Accessibilities Analysis** with mean of 4.0333 and 'high' agreement level.

Table 5 Mean Analysis of Solutions Of Spatial Economic Practice Problems In The Housing Construction Units.

The Solution of spatial economic practice in the affordable housing construction units	Mean	Agreement Level	Ranking
Using Geographic Information System (GIS).	4.1298	High	2
1 Allow for efficiency analysis.	4.0930	High	4
2 Allow visualization of spatial data.	4.0740	High	5
3 Enabling better decision making.	4.1110	High	3
4 Enabling better planning process.	4.1670	High	2
5 Determine location for housing project.	4.2040	High	1
Hedonic Price Analysis.	4.1076	High	4
1 Understand factor of housing price	4.1300	High	1
2 Allow to identify housing price	4.1300	High	1
3 Allow to identify various attributes.	4.0740	High	5
4 Increase quality in neighborhood.	4.0930	High	4
5 Allow to affordable housing price.	4.1110	High	3
Accessibilities Analysis.	4.0833	High	6
1 Understand level of housing connectivity.	4.0560	High	5
2 Understand movement of housing location.	4.0370	High	6
3 Understand case of essential amenities.	4.0740	High	3
4 Identify areas with good accessibility.	4.1480	High	1
5 Identify areas with transport option.	4.1110	High	2
6 Address challenges in housing Development.	4.0740	High	3
Spatial Clustering Analysis.	4.1482	High	1
1 Identify patterns for housing development.	4.1480	High	3
2 Allow clustering of housing area.	4.1110	High	5
3 Identify areas for housing development.	4.1670	High	1
4 Identifying high-cost houses location.	4.1480	High	3
5 Identifying low-cost houses location.	4.1670	High	1
Land Used And Zoning Analysis.	4.1002	High	5
1 House aligns with the designed land.	4.0740	High	4
2 House align with zoning analysis.	4.0930	High	3
3 Increase quality for housing development.	4.0740	High	4
4 Improving zoning regulation.	4.1300	High	1
5 Changes policies in zoning regulation.	4.1300	High	1
Market Study And Survey.	4.1157	High	3
1 Show demand insight in homebuyers.	4.0740	High	4

2	Insight preference of potential homebuyers.	4.1110	High	2
3	Develop good housing market trend.	4.1110	High	3
4	Reduce gaps in housing market.	4.1670	High	1

The most effective resolution for the challenges within spatial economic practices in housing construction units is found in spatial clustering analysis, marked by the highest mean value of 4.1482. Hence, addressing spatial economic issues in housing construction units, particularly through spatial clustering analysis, appears to be the most promising solution. Conversely, the least mean value of 4.0833 corresponds to accessibility analysis. This is due to a prevailing belief among respondents that emphasizing value flow isn't the optimal approach to practicing spatial economics. Consequently, this fulfils the secondary objective of identifying the primary solutions for spatial economic practice issues within housing construction units. The accomplished goal, as highlighted in Murray (1999), involves emphasizing the constraints on developing clustering tools for exploratory analysis primarily tied to median-based methods due to computational and solvability considerations. This insight can serve as a blueprint for crafting software or tools supporting the clustering and analysis of housing data, aiding stakeholders in recognizing clusters and patterns crucial for informed decision-making processes.

(d) Section D: Strength of Relationship Between the Main Problems with Main Solutions to spatial economic practice in the affordable housing construction units (Objective 3)

Table 6 shows the approximate significance for the variable's must < 0.05 and value must < 0.5 to show there is a relationship between the variables and there is a strong or a weak relationship. The approximate significance is related to variables. There are two types of hypotheses in this study which is H0 and H1. H0: The problems of spatial economic practice in the affordable housing construction units does not effects on construction developer to complete their project successfully. H1: The problems of spatial economic practice in the affordable housing construction units has an effect on construction developer to complete their project successfully. The number of variables that should be included in a prediction model is not predetermined and frequently depends on a number of different factors. The "one in five rule" which limits the number of variables or parameters that can be estimated from a data set, is a widely used technique in traditional prediction modelling (Chowdhury *et al.*, 2020).

Table 6 Crosstab Analysis (DeFranzo, 2010)

Appr.Significant	Value	Explanation
< 0.05	< 0.5	There is a relationship between the variables and the relationship is strong (H ₁ is accepted)
> 0.05	> 0.5	There is no association between the variables and the relationship is weak (H ₀ is accepted)

Table 7 and Figure 1 shows the value and approximate significance of the relationship between problems and solutions. The main problem Iterative reaction of agents on the observed situation (lead to increased housing price) with main solution Market study and survey (Insight preference of potential homebuyers) is the strongest H1. The second problem is Effecting in spatial interaction (imbalance in housing supply) with main solution Spatial clustering analysis (Identify areas for housing development) is the stronger H1. Third problem is Leads to agglomeration effect (Decreased congestion) with main solution Spatial clustering analysis (Identify areas for housing development) is the strong H1. Otherwise, main problem Iterative reaction of agents on the observed situation (lead to increased housing price) with main solution Spatial clustering analysis (Identify low-cost houses location) is the stronger H0. This result can be concluded as the one of the main hypotheses is accepted (H0).

Table 7 Relationship Analysis for Main Problems with Main Solutions

Main Problems	Main Solutions	Approximate Significant	Value	Hypothesis	Ranking
1) Iterative reaction of agents on the	1) Spatial clustering analysis	0.0750 (NO)	0.5000(STRONG)	H0	-
	-Identify areas for housing development	0.7050 (NO)		H0	-

observed situation -lead to increased housing price	-Identify low-cost houses locations	0.6690 (NO)	0.0560 (STRONG)	H0	-
	-Identify high-cost houses location		0.1180 (STRONG)		
	2) Using Geographic Information System (GIS)				
	- Determine location for housing project.	0.2510 (NO)	0.1500 (STRONG)	H0	-
	- Enabling better planning process	0.7050 (NO)	0.0560 (STRONG)	H0	-
	- Enabling better decision making	0.6690 (NO)	0.1180 (STRONG)	H0	-
	3) Market study and survey				
	- Reduce gaps in housing market.	0.0750 (NO)	0.5000 (STRONG)	H0	-
	- Insight preference of potential homebuyers.	0.0000 (YES)	0.0000 (STRONG)	H1	1
	- Develop good housing market trend.	0.5110 (NO)	0.2000 (STRONG)	H0	-
	4) Hedonic price analysis				
	-Understanding factor of housing price	0.000 (YES)	0.000 (STRONG)	H1	2
	-Allow to identify housing price.	0.000 (YES)	0.000 (STRONG)	H1	3
	-Allow to affordable housing price.	0.000 (YES)	0.000 (STRONG)	H1	4
5) Land used and zoning analysis					
- Improving Zoning Regulation.	0.0000 (YES)	0.0000 (STRONG)	H1	5	
-Changes policies in zoning regulation.	0.5110 (NO)	0.1880 (STRONG)	H0	-	
-House align with zoning analysis.	0.0000 (YES)	0.0000 (STRONG)	H1	6	
6) Accessibilities Analysis					
- Identify areas with good accessibility	0.6540 (NO)	0.0770 (STRONG)	H0	-	
-Identify areas with transport options.	0.0000 (YES)	0.0000 (STRONG)	H1	7	
-Understand case of essential amenities.	0.4360 (NO)	0.3330 (STRONG)	H0	-	
2) Effecting in spatial interaction -imbalance in housing supply	1) Spatial clustering analysis				
	-Identify areas for housing development	0.0000 (YES)	0.0000 (STRONG)	H1	1
	-Identify low-cost houses locations	0.3130 (NO)	0.0770 (STRONG)	H0	-
	-Identify high-cost houses location	0.0000 (YES)	0.0000 (STRONG)	H1	2
	2) Using Geographic Information System (GIS)				
	- Determine location for housing project.	0.3130 (NO)	0.0670 (STRONG)	H0	-
	- Enabling better planning process	0.3130 (NO)	0.0770 (STRONG)	H0	-
	- Enabling better decision making	0.0000 (YES)	0.0770 (STRONG)	H1	3
	3) Market study and survey				
	- Reduce gaps in housing market.	0.0000 (YES)	0.0000 (STRONG)	H1	4
	- Insight preference of potential homebuyers.	0.3130 (NO)	0.1000 (STRONG)	H0	-
				H0	-

	- Develop good housing market trend.	0.3130 (NO)	0.1000 (STRONG)		
	4) Hedonic price analysis				
	-Understanding factor of housing price	0.3130 (NO)	0.0910 (STRONG)	H0	-
	-Allow to identify housing price.	0.0000 (YES)	0.0000	H1	5
	-Allow to affordable housing price.	0.3130 (NO)	0.0000 (STRONG)	H0	-
	5) Land used and zoning analysis				
	- Improving Zoning Regulation.	0.0000	0.0000 (STRONG)	H1	6
	-Changes policies in zoning regulation.	(YES)	0.0000	H1	7
	-House align with zoning analysis.	0.0000 (YES)	0.0000 (STRONG)	H1	8
	6) Accessibilities Analysis				
	- Identify areas with good accessibility	0.0000 (YES)	0.0000 (STRONG)	H1	9
	-Identify areas with transport options.	0.3130 (NO)	0.1000 (STRONG)	H1	10
	-Understand case of essential amenities.	(YES)	0.0000 (STRONG)		
3) Effecting in spatial externalities -Increase costs of housing development	1) Spatial clustering analysis				
	-Identify areas for housing development	0.3130 (NO)	0.0910 (STRONG)	H0	-
	-Identify low-cost houses locations	0.3130 (NO)	0.0910 (STRONG)	H0	-
	-Identify high-cost houses location		0.1000 (STRONG)		
	2) Using Geographic Information System (GIS)				
	- Determine location for housing project.	0.3130 (NO)	0.0770 (STRONG)	H0	-
	- Enabling better planning process	0.3130 (NO)	0.0910 (STRONG)	H0	-
	- Enabling better decision making		0.1000 (STRONG)		
	3) Market study and survey				
	- Reduce gaps in housing market.	0.3130 (NO)	0.0910 (STRONG)	H0	-
	- Insight preference of potential homebuyers.	0.3130 (NO)	0.1250 (STRONG)	H0	-
	- Develop good housing market trend.	0.3130 (NO)	0.1250 (STRONG)	H0	-
	4) Hedonic price analysis				
	-Understanding factor of housing price	0.3130 (NO)	0.1110 (STRONG)	H0	-
	-Allow to identify housing price.	0.3130 (NO)	0.1110 (STRONG)	H0	-
	-Allow to affordable housing price.	0.3130 (NO)	0.1250 (STRONG)	H0	-
	5) Land used and zoning analysis				
	- Improving Zoning Regulation.	0.3130 (NO)	0.1110 (STRONG)	H0	-
	-Changes policies in zoning regulation.	0.3130 (NO)	0.1110 (STRONG)	H0	-
	-House align with zoning analysis.	0.3130 (NO)	0.1110 (STRONG)	H0	-

			0.1430 (STRONG)		
	6) Accessibilities Analysis				
	- Identify areas with good accessibility	0.3130 (NO)	0.1000 (STRONG)	H0	-
	-Identify areas with transport options.	0.3130 (NO)	0.1250 (STRONG)	H0	-
	-Understand case of essential amenities.		0.1670 (STRONG)		
4) Lead to agglomeration effects - Decrease congestion	1) Spatial clustering analysis				
	-Identify areas for housing development	0.000 (YES)	0.000 (STRONG)	H1	1
	-Identify low-cost houses locations	0.000 (YES)	0.000 (STRONG)	H1	2
	-Identify high-cost houses location	0.000 (YES)	0.000 (STRONG)	H1	3
	2) Using Geographic Information System (GIS)				
	- Determine location for housing project.	0.0750 (NO)	0.2140 (STRONG)	H0	-
	- Enabling better planning process	0.0750 (NO)	0.2500 (STRONG)	H0	-
	- Enabling better decision making		0.2730 (STRONG)		
	3) Market study and survey				
	- Reduce gaps in housing market.	0.0000 (YES)	0.0000 (STRONG)	H1	4
	- Insight preference of potential homebuyers.	0.3130 (NO)	0.1110 (STRONG)	H0	-
	- Develop good housing market trend.	0.0000 (YES)	0.000 (STRONG)	H1	5
	4) Hedonic price analysis				
	-Understanding factor of housing price	0.0000 (YES)	0.0000 (STRONG)	H1	6
	-Allow to identify housing price.	0.0000 (YES)	0.0000 (STRONG)	H1	7
	-Allow to affordable housing price.	0.0000 (YES)	0.0000 (STRONG)	H1	8
	5) Land used and zoning analysis				
	- Improving Zoning Regulation.	0.0000 (YES)	0.0000 (STRONG)	H1	9
	-Changes policies in zoning regulation.	0.0000 (YES)	0.0000 (STRONG)	H1	10
	-House align with zoning analysis.	0.0000 (YES)	0.0000 (STRONG)	H1	11
	6) Accessibilities Analysis				
	- Identify areas with good accessibility	0.0000 (YES)	0.0000 (STRONG)	H1	12
	-Identify areas with transport options.	0.0000 (YES)	0.0000 (STRONG)	H1	13
	-Understand case of essential amenities.	0.0000 (YES)	0.0000 (STRONG)	H1	14
5) Effecting in location changes. -Increasing housing price	1) Spatial clustering analysis				
	-Identify areas for housing development	0.000 (YES)	0.000 (STRONG)	H1	1
	-Identify low-cost houses locations	0.6540 (NO)	0.0710 (STRONG)	H0	-
	-Identify high-cost houses location	0.000 (YES)	0.000 (STRONG)	H1	2

2) Using Geographic Information System (GIS)				
- Determine location for housing project.	0.1720 (NO)	0.1880	H0	-
	0.6540 (NO)	(STRONG)	H0	-
- Enabling better planning process	0.0000 (YES)	0.0710 (STRONG)	H1	3
- Enabling better decision making		0.0000 (STRONG)		
3) Market study and survey				
- Reduce gaps in housing market.	0.0000 (YES)	0.0000 (STRONG)	H1	4
- Insight preference of potential homebuyers.	0.6540 (NO)	0.0910 (STRONG)	H0	-
- Develop good housing market trend.	0.6540 (NO)	0.0910 (STRONG)	H0	-
4) Hedonic price analysis				
-Understanding factor of housing price	0.6540 (NO)	0.0830 (STRONG)	H0	-
	0.0000 (YES)	0.0000 (STRONG)	H1	5
-Allow to identify housing price.		0.0000 (STRONG)	H0	-
-Allow to affordable housing price.	0.6540 (NO)	0.0910 (STRONG)		
5) Land used and zoning analysis				
- Improving Zoning Regulation.	0.0000 (YES)	0.0000 (STRONG)	H1	-
-Changes policies in zoning regulation.	0.0000 (YES)	0.0000 (STRONG)	H1	-
-House align with zoning analysis.	0.0000 (YES)	0.0000 (STRONG)	H1	-
6) Accessibilities Analysis				
- Identify areas with good accessibility	0.6540 (NO)	0.0770 (STRONG)	H0	-
	0.0000 (YES)	0.0000 (STRONG)	H1	6
-Identify areas with transport options.	0.4360 (NO)	0.3330 (STRONG)	H0	-
-Understand case of essential amenities.		0.3330 (STRONG)		

The researchers have successfully fulfilled objective three, which involves examining the correlation between the primary issues and solutions related to spatial economic practices within affordable housing construction units, as there hasn't been any prior study addressing this relationship. As stated in Rahim *et al.* (2019) this case seeks to explore the present status of unsold housing units and pinpoint the factors influencing this problem. It's imperative to delve deeply into this analysis to tackle these issues effectively. Otherwise, the accumulation of unsold units might strain market prices and rentals, potentially causing future repercussions. Spatial economic practice also revolves around comprehending the spatial interplay among diverse elements within urban settings, encompassing housing distribution, public amenities, and facilities. The disparity in spatial proximity between residential areas and essential public services or facilities leads to decreased welfare among low-income inhabitants, contributing to spatial inequality. This spatial mismatch denotes the scenario where housing communities are distant from vital public services and amenities, posing difficulties for low-income residents in accessing them. Such mismatch detrimentally affects the well-being of financially disadvantaged households, especially those comprising elderly individuals, individuals with lower education levels, underemployed individuals, or the unemployed, so the objective of the relationship has been achieved and related. Additionally, Figure 1 illustrates the primary problems alongside their respective solutions in the context of spatial economic practices within affordable housing construction units. From this analysis, the researchers can conclude that not all primary problems exhibit a correlation.

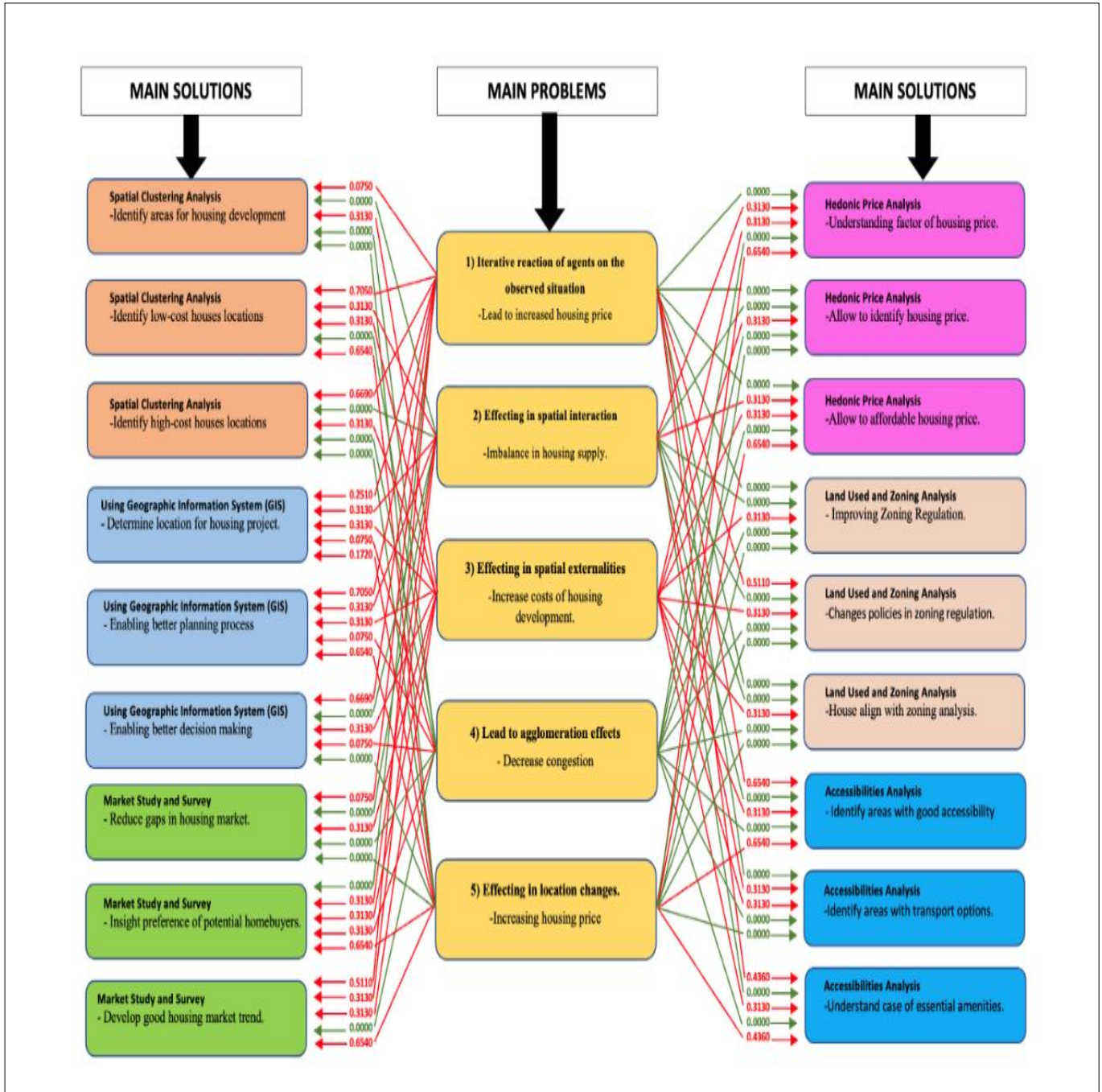


Fig. 1 Relationship analysis diagram for main problems with main solution

5. Conclusion

Expanding on this, the research's comprehensive data analysis from the completed questionnaires not only signifies a significant milestone in achieving the research objectives but also underscores the depth of understanding gained regarding the challenges in affordable housing development. The identification of the 'Iterative reaction of agents on the observed situation' as a central obstacle highlights the complex dynamics at play within the housing industry. Furthermore, the framework (refer Figure 2) of employing 'Spatial Clustering Analysis' is not just a theoretical solution but a practical strategy poised to revolutionize how affordable housing units are conceptualized, planned, and constructed. This innovative approach has the potential to optimize resource allocation, streamline decision-making processes, and ultimately contribute to the creation of

sustainable, well-designed, and accessible housing options for individuals and families in need. As stakeholders consider embracing these solutions, it is crucial to emphasize the collaborative aspect. The synergy between developers, policymakers, urban planners, and community representatives will be instrumental in actualizing these solutions. Such collective action can pave the way for a more robust and inclusive framework for affordable housing development. This collaborative effort is not just about erecting buildings; it's about fostering vibrant communities, promoting social equity, and uplifting the quality of life for those relying on affordable housing options. Therefore, the integration of these solutions into industry practices is not merely a business strategy; it is a commitment to societal progress and sustainable growth in the housing sector.

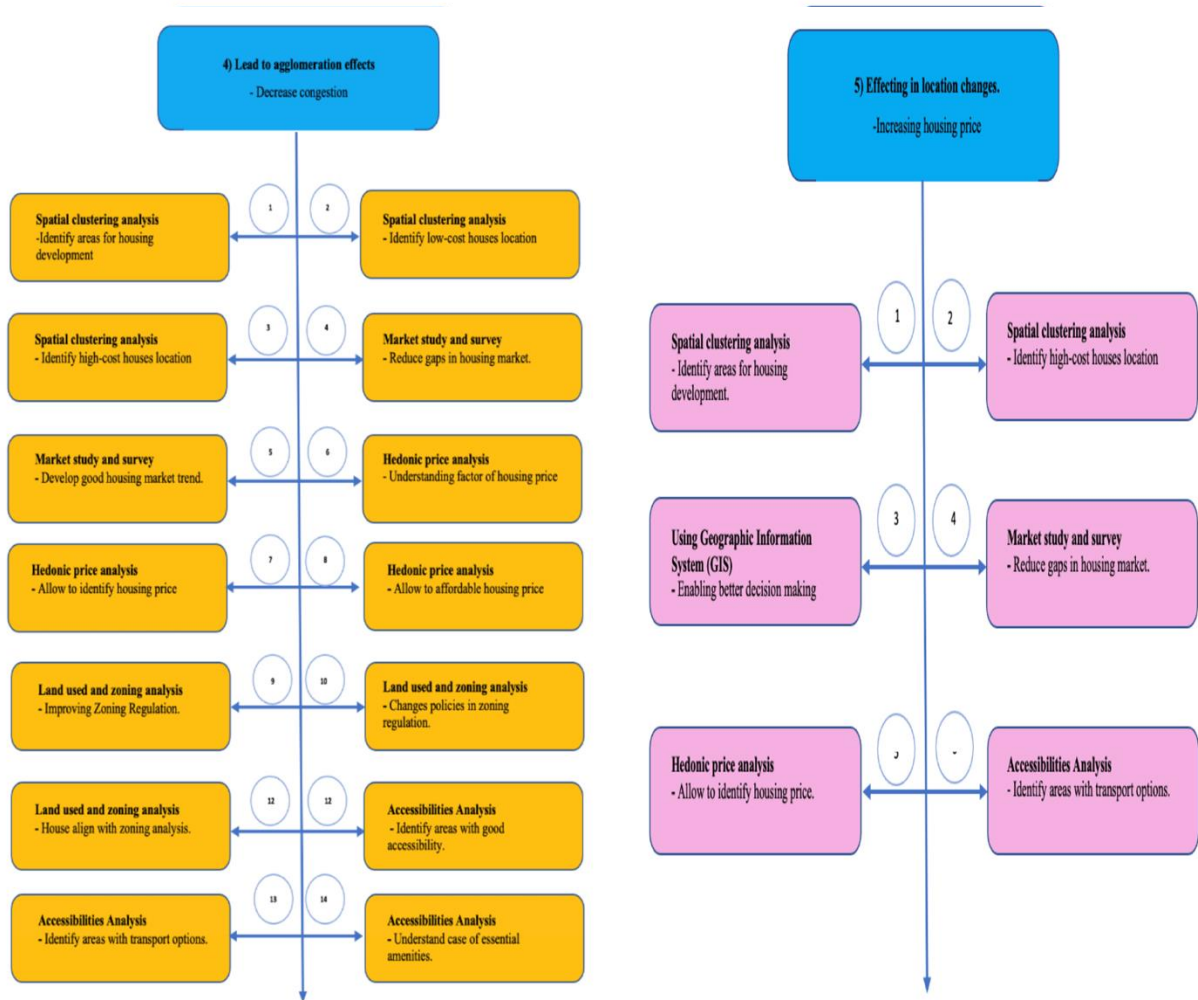


Fig. 2 Relationship Framework for Main Problems with Main Solutions to Empower LC Practices in Construction Project Management

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Mohammad Alif Mifzal Azman Shah, Rozlin Zainal; **data collection:** Mohammad Alif Mifzal Azman Shah; **analysis and interpretation of results:** Mohammad Alif Mifzal Azman Shah; **draft manuscript preparation:** Mohammad Alif Mifzal Azman Shah, Rozlin Zainal, Sharifah Meryam Shareh Musa, Mohd Hilmi Izwan Abd Rahim. All authors reviewed the results and approved the final version of the manuscript.

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