

The Mediating Effects Of Attitude On The Relationship Between Housing Characteristics And Housing Satisfaction: A Case Study On Penang Development Corporation (PDC)

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Abstract

This study attempts to improve understanding of the determinants of housing satisfaction among the residents of Penang Development Corporation (PDC)'s development projects. The population being studied involves residents of 21,123 housing units sold by PDC. Two types of measures have been combined in this study: the objective measures representing the housing characteristics and the cognitive measures of attitude such as perceptions on housing and neighbourhood environment. The mediating effects of attitude have been examined based on the Baron and Kenny (1986) model. The results of this study revealed that neighbourhood safety and neighbourhood social interaction fully mediate the relationship between project type and housing satisfaction. Furthermore, neighbourhood social interaction also fully mediated the relationship between length of residency and housing satisfaction.

Keywords: Housing characteristics, housing satisfaction and neighbourhood attitude.

Introduction

PDC is a semi-government body, established by the State Government of Penang on November 17, 1969 to initiate, plan, implement and promote socio-economic development projects for the benefit of the people. Its main activities include property development, development of industry, commerce, trade and tourism, development of industrial parks and undertaking the land reclamation work.

With evidence of strategic links between satisfaction and the overall firm performance (Anderson, Fornell & Lehmann, 1992; cited in Fournier & Glen Mick, 1999), it is now common to find mission statements designed around the satisfaction notion and incentive programs that target satisfaction as a goal. Hence, with its mission “to be a premier corporation in property development, investment, consultancy and tourism towards

satisfying customer needs”, PDC is no exception. Residential unit buyers represent the main bulk of the PDC customers and this group will be the focus in this research study. The concept of housing satisfaction has been used as an ad hoc evaluative measure for judging the success of housing developments constructed by the public sector and private sector. According to Shapiro (1973), the overall success of a non-profit organisation can be measured only in terms of the attainment of goals related to client satisfaction.

The overall objective is focused on assessing the mediating effect of housing & neighbourhood attitude (namely, perception on housing physical structure, neighbourhood safety and social interaction) on the relationship between the independent variables (that is, housing characteristics) and the dependent variable (housing satisfaction).

Thus, the following hypothesis have been formulated to test the relationship.

(i) Project Type:

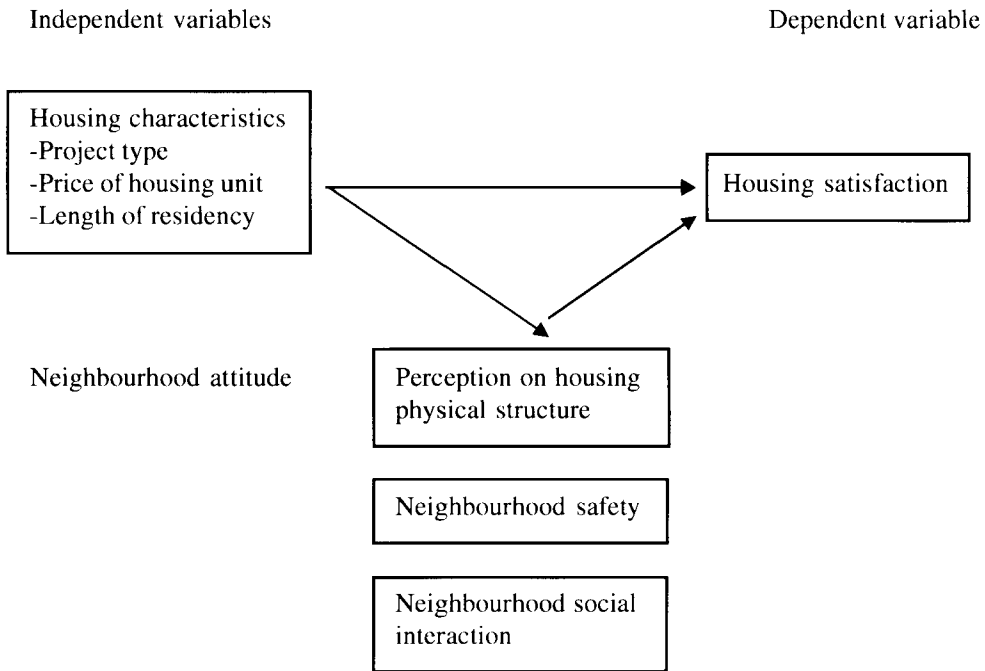
- H1a** *There is a positive relationship between Project Type and Perception of Housing Physical Structure.*
- H1b** *There is a positive relationship between Project Type and Confidence With Neighbourhood Safety*
- H1c** *There is a positive relationship between Project Type and Neighbourhood Social Interaction/Network*

(ii) Price Of House:

- H2a** *There is a positive relationship between House Price and Perception of Housing Physical Structure.*
- H2b** *There is a positive relationship between House Price and Confidence With Neighbourhood Safety*
- H2c** *There is a positive relationship between House Price and Neighbourhood Social Interaction/Network*

(iii) Length of Residency:

- H3a** *There is a positive relationship between Length of Residency and Perception of Housing Physical Structure.*
- H3b** *There is a positive relationship between Length of Residency and Confidence With Neighbourhood Safety*
- H3c** *There is a positive relationship between Length of Residency and Neighbourhood Social Interaction/Network*



LITERATURE REVIEW

Housing satisfaction is defined by Galster (1987, p.93; cited in Varady & Preiser, 1998) as the “perceived gap between a respondent’s needs and aspiration and the reality of the current residential context”. McCray and Day (1977) refers housing satisfaction to the degree of contentment experienced by an individual or a family member with regard to the current housing situation. Housing satisfaction is a complex attitude (Satsangi & Kearns, 1992). It encompasses satisfaction with the dwelling unit and satisfaction with the neighbourhood and the area (Onibokun, 1974). According to Ogu (2002) the concept of housing or residential satisfaction is often employed to evaluate residents’ perceptions of and feelings for their housing units and the environment.

There is considerable evidence in the literature that shows that housing satisfaction is influenced by a broad array of objective and subjectively perceived conditions (Theodori, 2001). Habitability of a house, according to

Onibokun (1974), is influenced not only by the engineering elements, but also by social, behavioural, cultural, and other elements in the entire societal-environmental system. The house is only one link in a chain of factors that determine people’s relative satisfaction with their accommodation.

It is in the nature of housing...that the immediate physical environment and the society about the household qualifies the kind of enjoyment which the household can expect from its dwelling. The appearance of neighbouring houses, the activities of neighbours, and the reputation of the neighbourhood...may add to or detract from the ultimate housing satisfactions...(Smith, 1970; p.26).

According to Francescato, *et al*, (1987), two aspects of variables considered by a study of residential satisfaction should be examined: First; the relative importance of predictor variables in accounting for the variation in overall satisfaction and second; the degree to

which the same predictor variables, taken together, explain the variation in overall satisfaction. Housing satisfaction in this sense becomes a criterion variable, and all components, aspects, factors, dimensions, or variables of a study should be examined for their ability to predict variation in the criterion.

Overall, the concept of housing does not lie on the individual's dwelling. It is a composite of the overall physical and social components that makeup the housing system (Francescato, *et al.*, 1987). Further, housing satisfaction is influenced by the numerous components in the system and the background characteristics of the occupants. Factors that have been found related to housing satisfaction include: length of residency (Brown, 1993; Marans & Rogers, 1975; cited in Theodori, 2001; Varady & Preiser, 1998), housing physical characteristics (Kaya & Feyzan, 2001; Yeh, 1972), satisfaction with housing physical condition and management services (Varady & Carrozza, 2000), social participation and interaction (Mohd Zulfa, 2000; Varady & Preiser, 1998) and past living conditions as well as residential mobility and future intention to move (Morshidi, *et al.*, 1999; Yeh, 1972). Those studies have combined both the objective measures such as demographics and physical characteristics of housing developments and the cognitive measures (such as perceptions and beliefs of residents about the physical environment).

RESEARCH METHODOLOGY

The Unit of Analysis and Population

The unit of analysis in this study is the residents of PDC's housing projects. They include PDC's housing buyers (owners) and tenants (renters). The population being studied involves the residents in 21,123 housing units sold by PDC in various locations in Penang.

Development of the scale item

Housing Characteristics

Prior research has shown that it is important to contextualise information on housing satisfaction by examining expected differences by development type, such as high-rise and landed (Popkin and Olson, 1995). PDC's housing development projects come in various characteristics such as in terms of type, size and price. These characteristics will be individually examined and analysed in relation to their contributions towards housing satisfaction.

Project Type

We expect the residents in landed property to be more satisfied with their house than those in high-rise because they generally have more space and privacy as compared to those in high-rise. Aspects of privacy have been used in Yeh (1972) and Ogu (2002) in their measures of housing satisfaction. For the purpose of our study, cluster type will be combined with landed type because of its structure, which is the same as landed.

Price of Housing Unit

PDC's housing development is categorised into five different classes according to the unit price as stipulated in Table 1. We expect that residents of a higher cost project will be more satisfied with their home than those of the lower costs. Residents of the higher cost projects are presumed to get a better housing environment, both in terms of physical structure and social environment. According to Andrews and Whitney (1976; cited in Ogu, 2002), residents' perception of their environment defines the quality of their lives. Housing satisfaction in turn is a predictor of an individual's perceptions of general quality of life (Campbell *et al.*, 1976; cited in Djebarni and Al-Abed, 2000). Thus, for the purpose of our study, we will differentiate the low and low-medium cost projects from the other classes of development (medium and high costs).

Table 1: Project Class and Price Range

Class	Price Range
Low Cost	RM25,000 and below
Low-Medium Cost	Between RM25,001 and RM50,000
Medium Cost	Between RM50,001 and RM100,000
Medium-high costs	Between RM100,001 and RM150,000
High cost	More than RM150,000

Length of Residency

Tenure or length of residency could affect satisfaction with a dwelling unit (Ogu, 2001). According to Varady and Preiser (1998), long-term residents (that is, those who lived at their locations for six years or more) will have stronger social ties to their area and this will make them more satisfied with their homes. Therefore, based on the guideline of Varady and Preiser (1998), we will group our residents into those who have lived in their dwelling for six years or more from those who have stayed for less than six years. With these criteria, we will examine their relationships with housing satisfaction.

Neighbourhood attitude

Intervening variables in this study, representing attitudes towards housing and neighbourhood are also the independent variables for housing satisfaction. The variables were selected from past studies including Djebarni and Al-Abed (2000), Mohd. Isa *et al.*, (1999), Mohd. Zulfa (2000), Tan and Hamzah (1979), Varady and Carrozza (2000), Varady and Preiser (1998), Varady, Walker and Wang (2001) and Yeh (1972).

Perception on Housing Physical Structure

Prior researchers (see for example: Mohd. Isa, *et al.*, 1990; Mohd. Zulfa, 2000; Ogu, 2002; Tan & Hamzah, 1979; Yeh, 1972) have included housing physical structure as one of their measures of housing satisfaction. Factors such as housing design, built-up area and

position of bedroom, kitchen, bathroom and toilet, ventilation, sunlight, corridor and housing compound and building material have been included to make up the physical/structure of a house that affect the householders' satisfaction towards their houses. As for the perception on housing structure, that the objective standard, largely physical structure of the dwelling forms one of the major components to define satisfaction (Smith, 1970). These structure attributes could be regarded as "shelter" as proposed by Orville (1943; cited in Mohd. Isa *et al.*, 1990). To measure the variable on objective standard or physical structure of housing, a straightforward Yes/No scale has been used to identify whether the items representing housing structure meet or does not meet the requirement of the householders.

Confidence with Neighbourhood Safety

Another condition that is expected to influence housing satisfaction is the neighbourhood safety. This variable will measure residents' safety in their home during night and safety on the streets near their home during the day (Mohd Isa *et al.*, 1999; Mohd Zulfa, 2000; Varady & Carrozza, 2000) as well as safety of the residents from vehicles taking into account the surrounding streets, parking lots and pedestrian walkways (Djebarni & Al-Abed, 2000).

To measure safety, we will adopt the classification of index crimes that are being

used by the Chicago Police Department, the Singapore Police Force and the Malaysia Police Department (Polis Diraja Malaysia). In general, the police departments classify the index crimes into violent crimes and property crimes. Violent index crimes are those committed directly against a person, such as robbery and aggravated assault/battery. Whereas property index crimes are those in which there is no direct threat or harm to a person, such as theft and burglary (Chicago Police Department). We assume that the more serious the incidents of crimes in the neighbourhood perceived by the residents, the less confident would they feel with their safety and the less satisfied would they be with their houses. On the other hand, the more confidence the residents feel about their safety in the neighbourhood, the more satisfied would they be with their houses. Confidence on safety includes safety in the house during the day and at night as well as safety from vehicles (which was measured by incidents of "reckless driving"). The 7 point-Likert scale used from very serious to not serious at all.

Perception on Neighbourhood Social Interactions

Vale (1997) has pointed out that, one reason that public housing residents tend to be satisfied with their homes is that they have strong social networks. Residents are able to turn to neighbours during times of need. Yeh (1972) has described this as neighbourliness. Filkins, Allen and Cordes (2000), in studying community satisfaction felt among rural Nebraskans have found that respondents express more satisfaction with communities that they regard as being friendly, trusting and supportive. Their findings have also revealed that the social aspects of a community (social ties) and satisfaction with social/spiritual factors seem to be important determinants of community satisfaction. Other researchers in Malaysia, for example Mohd. Isa *et al*, (1999) and Mohd Zulfa (2000) have also included the extent of social network in their studies to determine levels of housing satisfaction.

Thus, we expect that residents who has developed and relied upon a strong network would be more satisfied with their homes than those who are not. In our study, to measure social interaction, we will adopt the measures of the psychological sense of community developed by Nasar and Julian (1995). The same scale, a 7-point numerical scale anchored with "strongly disagree"(1) to "strongly agree"(7) was used to measure social interaction.

Housing Satisfaction

This study adopted the measures of housing satisfaction from Djebarni and Al-Abed (2000), Mohd Zulfa (2000) and Ogu (2002), a likert scale that ranges from 1 ("Very Dissatisfied") to 5 ("Very Satisfied").

ANALYSIS

Response Rate

Of the 550 questionnaires administered 223 were collected back. 9 questionnaires were found incomplete warranting their exclusion from the study. Hence only 214 usable questionnaires, representing a return rate of 38.9%.

Regression Analysis

Multiple regression analysis was conducted to predict the relationships between the independent variables and the dependent variable and the relationships between the independent variables and the intervening variable. Simple regression analysis was performed to ascertain the relationship between each of the intervening variable representing attitudes towards housing and neighbourhood and independent variable. The results of both regression analysis were also used to ascertain whether intervening variables exert mediating effects in the model using the procedures and conditions stipulated by Baron and Kenny (1986).

Relationships Between Independent Variables and Dependent Variable

Table 2 shows the relationships between Length of Residency, Project Type, Price of House and the independent variable, Housing

Satisfaction. The F-value of 7.17 is significant at <0.01 . R^2 value of .093 indicates that only about 9.3% of the variations in the dependent variable can be explained by the independent variables jointly.

Table 2: Relationship between independent variables and dependent variable

Independent Variables	Beta Coefficients (β)
Project Type	0.186**
Price of House	0.175**
Length of Residency	0.145*

Relationship Between the Intervening Variables and Dependent Variable

To further examine the types of relationship that they have with the dependent variable, another regression analysis is conducted to

examine variables representing attitudes towards housing and neighbourhood that have a significant relationship with housing satisfaction. The results of the regression have been summarised in Table 3.

Table 3: Results of Regression Analysis on Relationship Between the Intervening Variables and Dependent Variable

Perception	R2	Beta Coefficients
Housing Physical Structure	0.399	0.239**
Confidence With Neighbourhood Safety		0.234**
Neighbourhood Social Interaction/Network		0.490**

** Significant at $p < .01$

Relationship between the Independent Variables and the Intervening Variables

A set of regression analysis used to determine the relationships between the three independent variables and the three intervening variables (namely: perception on housing physical structure, neighbourhood safety and social network).

Table 4 shows that Project Type and House price are found to have a significant relationship with Perception on Housing Physical Structure at $p < 0.01$ and $p < 0.05$ respectively. Both Project Type and House price also have a significant relationship with neighbourhood safety at $p < 0.01$ level. Besides that, length of residency and project type are found to have a significant relationship with neighbourhood social interaction at $p < 0.01$.

Table 4: Relationship between Independent Variable and Intervening Variables

<i>Independent variables</i>	<i>Intervening variables</i>		
	<i>Perception on housing physical structure(β)</i>	<i>Neighbourhood safety(β)</i>	<i>Neighbourhood social interaction (β)</i>
Project Type	-0.319**	0.287**	0.201**
Price of House	0.145*	0.218**	0.033
Length of residency	0.071	0.044	0.239**

** Significant at $p < .01$ * Significant at $p < .05$

Each of the intervening variables that have a significant relationship with one or more of the independent variables will now be examined to ascertain whether there are any

mediator effects of the particular intervening variable on the relationship between independent variables and the dependent variable. The results are shown as in Table 5.

Table 5: Summary of hierarchical regression between independent variables and dependent variables on housing and neighbourhood attitude.

	Perception on housing physical structure(β)		Neighbourhood safety(β)		Neighbourhood social interaction (β)	
	Before	After	Before	After	Before	After
Project Type	-0.319**	0.255**	0.287**	0.069	0.201**	0.063
Price of House	0.145*	0.134*	0.218**	0.088	0.033	0.143
Length of residency	0.071	0.138*	0.044	0.147*	0.239**	0.034
Perception on housing physical structure		0.241**				
Neighbourhood safety				0.363**		
Neighbourhood social interaction						0.505**

** Significant at $p < .01$ * Significant at $p < 0.05$

Table 5 summarises the results of the hierarchical regression of the independent variables, perception on Housing Physical Structure, neighbourhood safety and neighbourhood social interaction and

Housing Satisfaction. As presented in the table, the R^2 value for both models 1 and 2 with Housing Satisfaction as dependent variable is 12.5% and 14.5.0% respectively, with F values which are statistically significant

($p < .01$). The results indicate that Perception on Housing Physical Structure partially mediate the relationship.

With reference to Table 5, the Project Type's and House Price's beta coefficient for model 2 is significantly reduced, while it's still significant indicating a partial mediator effect of Perception on Housing Physical Structure on the relationship between House Price and Housing Satisfaction. Our hypothesis **H1a** and **H2a** is therefore partially supported.

As for neighbourhood Safety and Housing Satisfaction, the R^2 value for both models 1 and 2 with Housing Satisfaction as dependent variable is 13.2% and 20.8% respectively, with F values which are statistically significant ($p < .01$). The R^2 change is 7.6% and a calculated F change value of 13.59 is also statistically significant ($p < .001$). The results indicate that Confidence with Neighbourhood Safety does provide additional explanatory power to the variation in the dependent variable, Housing Satisfaction. With reference to Table 5, both Project Type and House Price's regression coefficient for model 2 are not significant ($h = 0$), indicating a full mediator effect of Confidence With Neighbourhood Safety on the relationship between the independent variables and Housing Satisfaction. There is therefore validity for our hypotheses **H1b** and **H2b**, confirming the indirect positive relationship (through Confidence With Neighbourhood Safety) between Project Type and House Price, and Housing Satisfaction.

For Perception on Neighbourhood Social Interaction, the R^2 value for both models 1 and 2 with Housing Satisfaction as dependent variable is 11.6% and 31.4% respectively, with F values which are statistically significant ($p < .01$). The R^2 change is 19.8%. The results indicate that Perception on Neighbourhood Social Interaction does provide additional explanatory power to the variation in housing satisfaction. The beta coefficients for Project Type and Length of Residency in model 2 are

not significant ($h = 0$), indicating a full mediator effect of Perception on Neighbourhood Social Interaction on the relationship between the variables and Housing Satisfaction. There is therefore validity for our hypotheses **H1c** and **H3c** confirming the indirect positive relationship (via Perception on Neighbourhood Social Interaction) between Project Type and Length of Residency and Housing Satisfaction.

Summary

Upon examining the mediating effects of the intervening variables on the relationship between independent variables and dependent variable, the results indicate that, apart from providing additional explanatory power to the variation in the dependent variable, these intervening variables have also exerted a mediating effect on the relationship of independent and dependent variables.

DISCUSSION AND CONCLUSION

Project Type and Housing Satisfaction

The multiple regression analysis indicates that type of project was a significant predictor of housing satisfaction, supporting our hypothesis that landed residents are more satisfied with their house than those of high-rise. However, Project Type alone does not explain the customers' housing satisfaction. This is evidenced by our findings on the full mediating effects of the residents' attitudes towards their Neighbourhood Safety. However, the relationship between type of project and housing satisfaction was partially mediated by residents' perception on housing physical structure.

It is also useful to note that the relationship between Project Type and Perception on Housing Physical Structure was negative (Table 4), indicating that landed residents perceived the physical structure (which was measured by house design, ventilation, size and position of bathroom, bedroom and so on) of their houses as less meeting their

requirements than that of high-rise residents. Based on these results, we can conclude that even though high-rise residents perceived their housing units to have a better physical structure in terms of design, positions of bedroom and so on, landed residents are more satisfied with their housing (than that of high-rise) through their better perceptions on the neighbourhood environment. First, landed residents perceived their neighbourhood physical and social environment to be better than did high-rise residents. Second, landed residents feel more secured in terms of their safety in the neighbourhood; third, they perceived that they have better amenities in their neighbourhood and lastly, landed residents perceived that they have a stronger neighbourhood social ties or network as compared to that of high-rise. On the other hand, high-rise residents were less confident with their neighbourhood physical and social environment and safety (which had been measure by factors such as graffiti, litter/trash, noise from neighbours, housebreaking, theft and so on). In addition, they also perceived that their social network is not as strong as those in landed and that they have fewer amenities (facilities such as place of worships, transportation and so on) than that of landed.

Our findings above have been inline with previous studies of high-rise public housing whereby the main dissatisfactions (even though in general the respondents were satisfied with their housing) reported by the residents under study, were those matters pertaining to social and safety conditions as well as neighbourhood amenities. For example, in Tan and Hamzah (1979) - a study that included satisfaction of residents in Riffle Range flats, Kampung Melayu flats and a few other low cost flats in Penang, the residents had reported the following dissatisfactions with their flats:

- Noise level due to closeness of the blocks (45 feet apart, as the case of Riffle Range, whereby the minimum distance should be about 60 feet);

- Cleanliness of the area;
- Personal Safety;
- Non-availability of trishaw, which was a popular, individualised, cheap mode of transport in Penang (at that time – even though it is slower than bus);
- Distance between the flats and the city and to work
- Distance between the flats and medical facilities

House Price (Class of Project) and Housing Satisfaction

Residents of the higher cost projects were presumed to get a better housing, both in terms of physical and social environment. As noted by Smith (1970), "...the physical appearance of the neighbourhood – trees and grass belonging to prospective neighbours, the view obtained from the house in question...are also part of the housing 'package'..."(p8).

Based on our results of multiple regression analysis, we found that price of the housing unit was a significant predictor of housing satisfaction, supporting our hypothesis that residents of a higher cost which, in this study includes the medium and high cost classes are more satisfied with their houses than those of a low and low-medium cost projects. However, the influence of House Price has been mediated by the residents' perception on the housing physical structure, which was a partial mediator (in the relationship) and the neighbourhood safety, that have fully mediated the relationship (between House Price and housing satisfaction). These findings indicate that the high satisfaction of high cost residents has been partly influenced by their perceptions on housing physical structure. Whereas, the full mediator effects suggested that the high satisfaction of the high cost residents were fully influenced by the neighbourhood physical/social condition and safety. The high cost residents, as compared to that of the low cost perceived that their housing physical structure is better

and that they have had a better neighbourhood environment in terms of physical, social and safety condition and this made them more satisfied with their housing.

Length of Residency and Housing Satisfaction

Our findings revealed that housing satisfaction is also influenced by the duration or the number of years the residents has stayed in the housing location. Six years has been the cut-off duration in this study, based on Varady and Preiser (1998) that proposed that long-term residents, those who lived at their locations for six years or more will have stronger social ties to their areas and this will make them more satisfied with their homes. That findings was supported by Ogu (2001).

Our findings have also been inline with that of Varady and Preiser(1998) as well as Ogu (2001), whereby, Length of Residency was found to be fully mediated by Neighbourhood Social Interaction. In Varady, Walker and Wang (2001), - a study of relocation of public housing's voucher recipients, it was found that many of the respondents or voucher recipients have chosen to stay in the same area of the public housing neighbourhood. These findings, according to Varady, Walker and Wang (2001), reflected that voucher recipients sought to remain in or close to their original neighbourhood to be near to friends and relatives and familiar bus lines. This was reflected in our study whereby, those residents who stayed in their locations for six years or more perceived that they have a good neighbourhood amenities (which were measured by transportation, clinics, schools and so on) and this has made them more satisfied with their housing than those who had stayed for less than six years.

IMPLICATIONS AND RECOMMENDATION

With regards to the general satisfaction of PDC's housing customers, although the overall

level of satisfaction was found to be above average, there are still rooms for improvements. For example, in terms of housing physical structure of landed property, it would be worthwhile to look into those items which received high percentages of unfavourable response, such as housing designs, size of kitchen and bathroom and etc. Same goes to high-rise type of projects that recorded high proportion of unfavourable responses in terms of availability and size of drying area. Further, with regards to residents' perception on neighbourhood, factors such as neighbourhood social interaction exerted the highest influence on housing satisfaction. Greatest implication would be on the part of planning especially for future development projects that would be undertaken by PDC. Factors such as access roads, transportation and so on would be a very important factor that requires close attention.

Another important finding that would require close attention in the part of not only PDC but also of other local authorities is on level of satisfaction attained by those residents of the low and low medium cost as opposed to those of the medium and higher cost projects. Our results indicated that the medium and high cost residents were more satisfied with their housing as compared to those of the low and low medium costs because (partly) they perceived that they have a better housing physical structure and neighbourhood environment in terms of the physical and social conditions and safety. Henceforth, in line with the PDC's fundamental objective in housing policy of providing for the housing needs of the Penang State's population particularly among the low and medium income groups, these findings would suggests that PDC, together with the relevant authorities look into these matters particularly on the socio-economics of the low cost residents.

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