CHAPTER 4

PHASE 1: DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents the results of data analysis and findings of the study made based on the primary data collected using a specially constructed questionnaire. The main objectives of the questionnaire are to measure the extent of acceptance and establish issues on the concept of self build houses, to ascertain knowledge and skills in construction and routine maintenance of the house and to establish factors that influence housing demands. In this study, low-income household are referring to the total income of all members in the family which is below RM1,500 per month. The questionnaires were administered on a total of 501 rural low-incomers from two different districts in Kedah, i.e. Baling and Padang Terap.

The chapter also reviews the results in the framework of the analysed theories and case studies in Chapter 2. The findings discussed comprise the whole of those statistically significant results using the quantitative investigation. **The core issues involved here are the awareness of public in the rural area to own a house through self build approach and willingness to participate in self build housing program.**

Generally, this chapter consists of several sections. The chapter begins with briefly describing the series of interviews with selected related organisations followed by profile of rural low-income earners who took part in this study and their relationship towards existing house condition and awareness of self build house concept as an

alternative to own a house. Then, the next section focuses on identifying the need to renovate their houses and problems that are associated with it. Subsequent to that, the next set of questions investigates level of acceptance towards self build house concept in view of their willingness to be involved in such schemes. The final section discusses on exploring the level of knowledge and skills in construction among rural low-income earners. All statistical analyses were carried out using the Statistical Package for Social Science (SPSS) version 13.0.

4.2 Interviews With Selected Organisations Involved In Housing Provision

The following sections are a summary of interviews that were conducted for selected organisations that are related to low cost housing at national as well as state level. Three main organisations were found to contribute either direct or indirectly into this issue of self build housing.

4.2.1 Housing Loan Scheme Division (Bahagian Skim Pinjaman Perumahan - SPP)

A formal structured face-to face interview was conducted between the researcher and the Director of SPP. He was helpful to provide some confidential data on the applicants background and because of that, the researcher was able to accurately identify the states and districts in which have the highest applications for the loan.

The Housing Loan Scheme Division (SPP) is established under the Ministry of Housing and Local Government to administer Housing Loan Trust Account For The Low-income Group (Akaun Amanah Pinjaman Perumahan Untuk Golongan Berpendapatan Rendah). The Parliament approved the setting up of this trust on 17th December 1975 under the Financial Matter Act 1957 (Pin, 1972) and has been put into operation since 1976.

In addition, the program is given the responsibility to manage the Federal Government Special Fund Program (Program Dana Khas Kerajaan Persekutuan) through Terengganu State Public Housing Loan Scheme Trust Fund (Tabung Kumpulan Wang Amanah Skim Pinjaman Perumahan Rakyat Negeri Terengganu). By year 2002, SPP Division has taken over to oversee Public-owned Housing Program Trust Fund.

Housing Loan Scheme For The Low-income Group is a scheme which facilitates the need for the low-income families that has a household income of RM500 – RM1200 a month. The loan is funded by the Federal Government to assist in either buying a low-cost house with a maximum limit of RM20,000 or to assist in building their own houses not exceeding RM25,000. For every house that needs to be built, the applicant must have a minimum funding to start off the basic infrastructure works.

It is the objective of SPP Division to ensure that the low-income families in Malaysia that have no other sources to obtain financial aid, will be able to receive it from this department in order to build their own house or buy a low-cost house. This purpose is in accordance with the National Housing Policy.

A. The activities involved in this division are:

1. To administer Housing Loan Trust Account For The Low-income Group
2. To process loan applications
3. To collect and update data on borrowers
4. To ensure the repayment matter is well-managed
5. To promote the alternative scheme for housing loan
6. To monitor construction stages for payment verification

7. To ascertain non performing loans and enforcement of Default Charge Notice and Auction Notice
8. To administer Public-owned Housing Program Trust Fund

B. The loan facility will be given only to those who have met the SPP division's requirements. Its requirements are:

1. A Malaysian citizen
2. Age between 18 – 48 years old
3. Never owned a house
4. Total income of household is RM500- RM1200
5. Maximum loan is RM25,000 (service fee of 4% is charged on the second RM10,000)
6. Property under the applicant's name in order to mortgage it against the loan
7. Willing to use applicant's own house plans or the ministry's
8. The price of the completed house should not exceed RM25,000
9. Require to take Life and Fire Protection Insurance, which will be included in the loan
10. Require to name the next of kin to proceed with repayment if applicant is unable to do so.
11. Period of repayment is 5 – 20 years.

C. The following are the requirements for two separate approaches of owning a house under SPP scheme:

Based on the approach by SPP, there are still procedures and requirements of which self build participants needed to meet. Such list of requirements can be difficult for

some to fulfill hence many resort to buying construction materials when and how much they can afford.

Table 4.1: Comparison of Requirements for Self Build Houses and Buying Existing Houses

CONSTRUCTING SELF BUILD HOUSES	BUYING READY MADE HOUSES
A Malaysian citizen	A Malaysian citizen
Age between 18 – 48 years old	Age between 18 – 48 years old
Never owned a house	Never owned a house
Total income of household is RM500-RM1200	Total income of household is RM500-RM1200
Maximum loan is RM25,000 (service fee of 4% is charged on the second RM10,000)	Maximum loan is RM20,000 (service fee of 4% is charged on the second RM10,000)
Property under the applicant's name in order to mortgage it against the loan	The house intended to buy possess title
Willing to use applicant's own house plans or the ministry's	Mortgage of property as collateral to the loan
The price of the completed house should not exceed RM25,000	Price of house is base on low-cost houses according to location and area
Require to take Life and Fire Protection Insurance, which will be included in the loan	If the vendor still has debt, the applicant has to appoint a lawyer as stakeholder and all lawyer's fees are to be borne by applicant
Require to name the next of kin to proceed with repayment if applicant is unable to do so.	Require to take Life and Fire Protection Insurance, which will be included in the loan
Period of repayment is 5 – 20 years.	Require to name the next of kin to proceed with repayment if applicant is unable to do so.
	Period of repayment is 5 – 20 years.

D. The payment of loan given to build his/her house follows a certain schedule:

Table 4.2: Schedule of Payment Based on Progress

PHASE	WORKS	PERCENTAGE
1st Phase	Upon completion of foundation works	35%
2nd Phase	Upon completion of columns and roof trusses	25%
3rd Phase	Upon completion of wall, installation of doors and windows	30%

Table 4.2: continued

PHASE	WORKS	PERCENTAGE
4th Phase	Upon connection of water and electricity supply and verified by an architect from National Housing Department or local authority	10%

E. Loan repayment

Total amount of loan inclusive of service fees 4% chargeable for the second RM10,000 with insurance premium needs to be paid after the borrower has received repayment schedule according to the fixed rate as agreed in earlier offer letter. The monthly installment can be made by paying cash but the borrower needs to come to SPP Division in Kuala Lumpur or during collection visits by their officers. Payment could also be done through postal order or cheques. It could also be made through salary cut of borrower or next of kin. In order to do so, information and forms need to be submitted to the current employer of the borrower.

Borrowers that have delays in repayment can be charged under the stated law, which includes taking over the mortgaged property. Furthermore, the borrower would have to bear the cost of court hearing and auction process. In a case of permanent disabilities or death, which occurs before the payment is settled, the insurance would fund the repayment.

F. The process

Based on an interview with the Director of SPP Division, it is necessary for the applicant to own a piece of land before applying the loan. Prior to that, the applicants should possess some minimal financial reserve to at least be able to initiate foundation works for self build houses. Payment will be done according to the stages that were listed in Table 4.2. The application takes 2 weeks to be approved subjected to

applicant's requirements or criteria. It usually requires a field officer to do inspection before approving payment of the 1st stage in the case of constructing self build houses.

4.2.2 Kedah Region Development Board (KEDA)

KEDA was established on May 28th, 1981 under the Act 249, Regional Development Board Act 1981 to assist the growth of social-economic development under KEDA's jurisdiction. The area consists of 8.279 km^2 which is equivalent to 89% of the total Kedah State. As a federal government agency under the Rural and Regional Development Ministry, KEDA is responsible to develop in various aspects such as poverty eradication, infrastructure and social amenity development, development of traditional villages and provision of Hardcore Poor Housing Program (PPRT), development of cottage industry and entrepreneurship as well as skill development and human capital.

A structured face-to face interview was conducted between the researcher and the officer in charge. Mrs. Norliza binti Ahmad was not only providing explanation on KEDA's role but also providing some data on housing schemes that were implemented. There were a few other officers that joined the interview as they were from various departments that were also involved in the policy making and design sections. As part of the policies, KEDA aims to encourage social-economic growth in the rural area especially for the targeted groups listed under KEDA. This is done through development human resources, skills training and improvement on the quality of life. At the same time, KEDA intends to encourage the targeted group to participate in economic activities through people empowerment. In addition to this, KEDA plans to maintain equilibrium growth between urban and rural areas.

The keyword in the policy stated above is people empowerment, which strongly relates to the approach of self build in housing (Turner, 1976; Habraken, 1972; Pugh, 2001). It is again emphasised by Idris (2009) on Policies and Strategies after the NEP, whereby one of the strategies to improve planning and development in rural area is through community empowerment.

A scheme under KEDA referred to as Skim Pembangunan Kesejahteraan Rakyat (SPKR) or People's Welfare Development Scheme, targets the hardcore poor of average monthly household income figure of RM416.00. The scheme is responsible in executing Program Perumahan Rakyat Termiskin (PPRT) or Housing for the Hardcore Poor Program, obtaining funding for economic project such as agriculture and farming at the same time conduct training and guidance.

Another program in SPKR is offering financial and management support for the low-income households to acquire a decent and comfortable house through Program Bantuan Rumah (PBR) or Home Aid Program, and eventually would lead to improvement in quality of life. Most of the houses are either newly built or upgraded from existing ones. Figure 4.1 refers to the number of houses built according to districts (1997-2005).

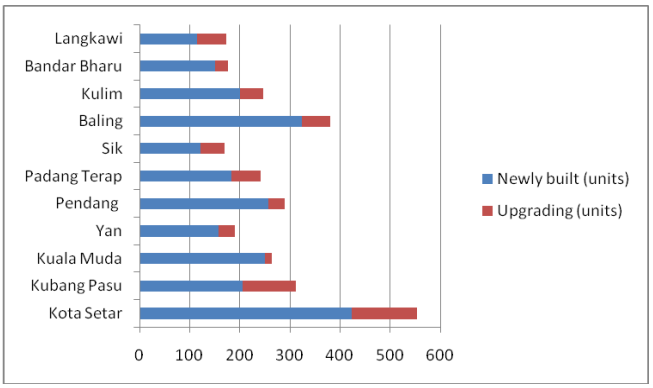

Figure 4.1: Number of Houses Newly Built and Upgraded

An additional program to assist in increasing monthly income for the hardcore poor is Program Peningkatan Pendapatan (PPP) or Income Improvement Program through micro-lending or banking for setting up small businesses, services, agriculture and farming.

However, even though the practice of constructing a house using available skills and resources of the users is far from unusual in many parts of the area of Kedah, particularly where traditional or vernacular survive coupled with government policies that relate to empowerment, the idea of self build housing as an alternative sector is not further exploited. In order to ensure an efficient working state government, each of the district office has their own standard organisation and personnel headed by a District Officer under which the townships are identified and Jawatan Kuasa Kecil Kampung (JKKK) or Village Committee are elected by their respective villages. Refer to Figure 4.2.

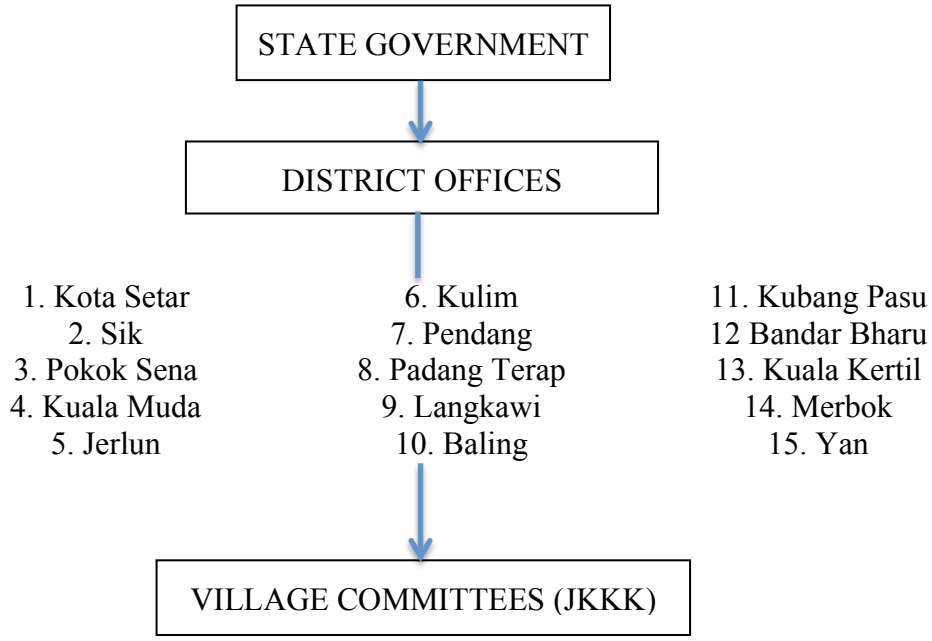

Figure 4.2: Summary of Structure Organisation Indicating the Relation of Village Committees in the State Government

1. Baling District Office

Baling District Office was set-up in 1852 when the state government of Kedah assigned a penghulu or Head of Village to administer the Baling District. Only in 1908 a district officer was elected and changes in administration were made.

Through an interview with the district officer, it is clear that the administration intends to reduce the poverty gap in the population of Baling through the Hardcore Poor Development Program or Program Pembangunan Rakyat Termiskin (PPRT) along with organising projects and activities for safety of neighbourhoods, social benefits and harmony.

The population in Baling is concentrated in townships that are growing due to locations and economic magnets provided in and around the towns such as the township of Kupang (5,154), Pulai (4,815) and Tawar (4,046). Refer Figure 4.3. In these townships, low cost housing projects such as single story terrace and detached houses are seen to be taking over the housing supply, hence making the need for the third sector in housing industry becoming more unpopular. Despite the fact that there are still a considerable number of low income households that could not afford these types of houses, the state government together with private developers insist on such projects to proceed.

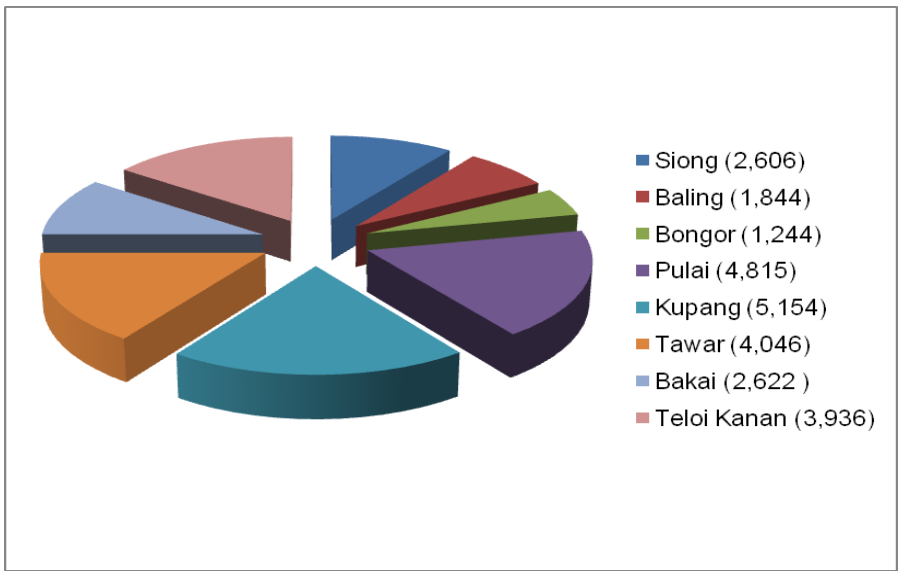

Figure 4.3: Number of household distribution in Baling District

The district office explained that the funding and housing projects for the hardcore poor households are decided mostly through the village committee (JKKK) representatives. Hence, only limited low-income households can be assisted through state housing programs.

2. Padang Terap District Office

Padang Terap District Office was established much earlier as compared to Baling. It was officiated in the 1920s in which it shared its building with land office, religious, voluntary and agriculture office. It was earlier based in Kampung Padang Nyuir but later in 1960s it was moved to Pekan Kuala Nerang. This is to ensure ease of accessibility from the public when needed to do business at the government agency centre. The district office is being administered by a district officer and his staff together with 12 penghulus or heads of the village, 103 village committee together with 118 kampungs. The same approach applies in this district office whereby decision to put forward families that needed houses is based on what the JKKK's relationship with the rest of the members of the village.

4.2.3 Construction Industry Development Board (CIDB)

Another interview which was also conducted in the office of one of the IBS Modular Coordination expert on the subject of IBS as part of the construction industry and policy in Malaysia. Information on CIDB's role as well as the history on its establishment in Malaysia Construction Industry is paramount to some of the housing issues imposed to private and public sectors.

CIDB of Malaysia was established in 1994 under the Ministry of Works or Jabatan Kerja Raya (JKR). Its function is to promote and stimulate the development, improvement and expansion of the construction industry; not to mention to advise and make recommendations to the Federal Government and the State Governments on matters affecting or connected with the construction industry; which includes promoting and undertaking research in any matter related to construction industry. Among many other functions that CIDB was set to achieve, one particular is to encourage the standardisation and improvement of construction techniques and materials. This is further described through 2 approaches in CIDB – Industrialised Building Construction (IBS) and Modular Coordination (MC).

CIDB's main objective in developing the capacity and capability of the construction industry through the enhancement of quality and productivity has been committed by structuring great emphasis on their strategic thrusts (CIDB, 2007). One of the strategic thrusts that CIDB has stated is to innovate through research and development and adopt new construction methods. The research priority areas were listed so that institutions, universities or organisations are aware of the need to develop and innovate new construction techniques, materials, management etc. to allow for improvements. Refer to Figure 4.3.

Table 4.3: Research Priority Areas by CIDB[1]

Research Area	Details
Construction Materials	Development of indigenous e.g. 1. Timber, wood-based, bio-composites 2. Steel products based on local materials 3. Cement and concrete products 4. Rubber based products 5. Advanced material and technologies including nanotechnology 6. Value added local materials 7. Material performance and analysis
Construction machinery and equipment	1. Construction machinery 2. Test and measurement apparatus
Construction productivity and quality	1. Construction management 2. Construction policy research 3. Buildability 4. Zero defects 5. Standards and quality development
Industrialisation of construction	i) Prefabrication and offsite production ii) Modular coordination iii) Standardisation iv) Mechanisation v) Construction system and performance vi) Process improvements
IT in construction/ knowledge-based construction	1. Development towards integrated environment 2. Real-time data management 3. Computer Aided Design (CAD) e.g. design software 4. Man-machine interfacing 5. Artificial intelligence and expert systems 6. Virtual reality 7. Global Information System (GIS)
Environment and sustainability	1. Environmental engineering 2. Sustainable construction 3. Life cycle analysis 4. Recyclables, reusability of building and construction materials 5. Energy efficiency 6. Manipulation and properties through genetic engineering
Construction health and safety	1. Research towards enhancement on health and safety at site 2. Occupational ergonomics 3. Public health

[1] Source: CIMP 2006-2015 (2007), pp.195. (Technology Foresight Report, CIDB)

Table 4.3: continued

Architecture and habitat	1. Research towards living comfort 2. Human friendliness 3. Urban environment 4. Heritage and conservation 5. Development of open systems
Engineering aspects of construction	Research in the technological aspects of construction in the areas of: 1. Building 2. Roads, railway, harbour, canals 3. Drainage and irrigation 4. Electrical and mechanical, oil and gas, telecommunication works 5. Bridges, dam, tunnel, earthwork, waterworks and reclamations

IBS is a construction process that utilises techniques, products, components, or building systems which involve prefabricated components and on-site installation. In Malaysia it is classified into 5 main groups – 1) **pre-cast concrete framing, panel and box systems; 2) steel formwork systems; 3) steel framing systems; 4) prefabricated timber framing systems; and 5) block work systems.**

The decision of promoting timber IBS was announced in 2005 by the former Minister of Works, Dato' Seri S. Samy Vellu. Only recently many researchers in Malaysia are now looking into possibility of prefabrication in timber for affordable housing. A group of researchers at UPM, under CIDB's research grant, created a double framing timber construction using timber IBS technology as an innovation. A hybrid house referred to as SOHO (small office home office) using timber and steel was constructed in CIDB centre. SOHO introduces a lightweight timber IBS construction technology that uses prefabricated timber structural components, which are manufactured off site later transported to site and assemble to form a building. There are also researchers that look into prefabricated timber structural element such as engineered glue laminated beam or columns for longer spans, which are conducted in other higher institutions. Regrettably, these structures are deem expensive to be used in

the low-cost housing and it is still in the testing period, therefore manufacturing is not possible yet.

Whenever IBS is mentioned, the term Modular Coordination (MC)[2] is used as well. The introduction of MC in the industry not only provides dimensional basis for the coordination of dimensions and of those buildings incorporating them, but also it acts as a tool towards rationalization and industrialization of the building industry. Regrettably, most manufacturers of construction materials are unable to comply due to higher initial cost in changing the machineries. The step taken by these manufacturers is just to use dimensions in metrics instead of imperial.

4.3 Description of Households and House Status in Baling and Padang Terap

A total of 501 respondents completed the questionnaire. Table 4.5 summarizes the characteristics of the profile of rural low-income earners such as in term of the variables location, type of existing house, race, and head of family's gender, age, level of education, monthly household income and status of existing house.

The total sample is divided into two different districts. 250 respondents randomly selected are from Baling and another 251 respondent are from Padang Terap. It is useful to observe if there any differences in perception towards self build concept among the two different districts.

During the data collection, the researcher discovered that majority (98 percent) of the respondents lived in rural areas are Malays. This means that any differences in perceptions of low-income earners towards self build house among different ethnic

[2] Malaysian Standard MS 10064: Part I -10: 2001

group cannot be determined. In terms of age distribution, 60 percent of the rural low-income earners aged between 40 to 59 years old. Only a small percentage of rural low-income earners are young (less than 30 years old).

Majority of rural low-income earners are not highly educated. Nearly half (49.4 percent) of the rural low-income earners only completed their primary school. In addition, 42.7 percent of them completed secondary school. It may reflect on their monthly household income where majority of them received not more than RM1, 000 per month. It is known that 87.2 percent of low-income earners worked as rubber tappers and farmers, which is considered to be in the informal sectors. The survey establishes an average earning per household is RM618 a month. This amount is categorise as below poverty level as defined by the Ministry of Women, Family and Community Development (KPWKM – Kementerian Pembangunan Wanita, Keluarga dan Masyarakat). Refer to Table 4.4 for further breakdown on the various levels of poverty and districts.

Table 4.4: Definition of Level of Poverty

Districts:	Area	Poor		Hardcore Poor	
		Household Income (RM)	Per Capita (RM)	Household Income (RM)	Per Capita (RM)
Peninsular Malaysia	Urban	740	185	440	100
	Rural	700	160	420	100

Majority of the rural low-income earners, which is 77.7 percent, lives in village houses that are owned by them. This is followed by 15.5 percent, which inherited their house from generations. Only a small percentage acquired their homes, either through government subsidy schemes or was able to buy from them. Renting of houses among the local people here are near to nil. This can be concluded that all staying in the rural

area own their own houses and would eventually make an effort to build one. Refer Table 4.5.

As the interview were done at random, where either the researcher approached the head of the village to be introduced to a few potential respondents or proceeded directly to respondents' individual homes, it is found that majority 88.8 percent of head of the household are male. While the females, who are mostly single mothers age between early 40s and 60s, voiced out their concerned on the rationalities of participating in self build construction.

Table 4.5: Demographic characteristics of rural low income earners

	Frequency (n)	Percent (%)
District		
Baling	250	49.9
Padang Terap	251	50.1
Race		
Malay	498	100.0
Age group		
Less than 30	32	6.4
30-39	60	12.1
40-49	145	29.2
50-59	161	32.4
Above 60	99	19.9
Education level		
Primary school	245	49.4
Secondary school	212	42.7
Tertiary	8	1.6
No schooling	31	6.3
Monthly household income		
<RM500	244	49.0
RM500-RM1,000	220	44.2
RM1,001-RM1,500	34	6.8
Type of existing house		
Village house	492	98.2
Single story terrace house	7	1.4
Government quarters	2	0.4

Table 4.5: continued

	Frequency (n)	Percent (%)
Status of existing house		
Self-owned	380	77.7
Rented	22	4.5
Inherited	76	15.5
Others	11	2.2
Head of family's gender		
Male	444	88.8
Female	56	11.2

4.4 Characteristics of Rural Low-Income Profile and The Need of House

These investigations is set out to examine whether there is any demographic differences for those who need a house and do not need a house. Chi-squared test is used to determine whether there is any significant difference in the need of a house among rural low income earners. Table 4.6 shows the results of the demographic characteristics and chi-squared test.

The result in Table 4.6 shows that there is a significant difference in the need of a house among ‘district’, ‘monthly household income’ and ‘status of existing house’. However, other demographic characteristics do not seem to show any differences in the need of house.

Both Baling and Padang Terap residents need a house. However, the need of a house is more noticeable for Padang Terap residents where 71.3 percents of them require owning a house. As these people grow older, the need for a house decreases. People in younger age group tend to need a house more than older age group. The need of a house for those who completed their primary and secondary school are almost at the same percentage (67 percent). This study reveals that the need of a house is not critical for those who complete tertiary education. In terms of household income, the need of a

house is critical for those who earns below RM500 per month. It can be concluded that those with tertiary education comes from a stable family with a secured monthly income. Thus the need to pursue for another house does not seem to be an urgent matter. Unlike those who earned less than RM500 per month, had to ensure that security of having a shelter over their family's head is critical. Even the type of houses that are mostly owned by these respondents are village houses (60.1%) as compared to 57.1% staying in terrace houses. This implied that traditional village houses are still at large and being constructed among the local people. The proximity of work area, school facilities, neighbourliness and land area are among the reasons given when asked why they still stay in the current house although the state of it is sub-standard.

Table 4.6: Characteristics of rural low-income profile and the need of a house

DATA	Need a house				Total
	No		Yes		
	n	%	n	%	
District					
Baling	98	39.2	152	60.8	250
Padang Terap	72	28.7	179	71.3	251
Chi-square statistics = 6.177					
p-value = 0.013*					
Age group					
Less than 30	8	25.0	24	75.0	32
30-39	14	23.3	46	76.7	60
40-49	44	30.3	101	69.7	145
50-59	60	37.3	101	62.7	161
Above 60	40	40.4	59	59.6	99
Chi-square statistics = 7.622					
p-value = 0.106					
Education level					
Primary school	81	33.1	164	66.9	245
Secondary school	69	32.5	143	67.5	212
Tertiary	5	62.5	37.5	0.9	8
No formal schooling	14	45.2	17	54.8	31
Chi-square statistics = 4.906					
p-value = 0.179					

Table 4.6: continued

DATA	Need a house				Total
	No		Yes		
	n	%	n	%	
Monthly household income					
<RM500	67	27.5	177	72.5	244
RM500-RM1,000	90	40.9	130	59.1	220
RM1,001-RM1,500	13	38.2	21	61.8	34
Chi-square statistics = 9.581					
p-value = 0.008*					
Type of house					
Village house	167	33.9	325	60.1	492
Single storey terrace house	3	42.9	4	57.1	7
Government quarters	0	0.0	2	100.0	2
Chi-square statistics = 1.276					
p-value = 0.528					
Status of existing house					
Self-own	147	38.7	233	61.3	380
Rented	1	4.5	21	95.5	22
Inherited	20	26.3	56	73.6	76
Others	0	0.0	11	100.0	11
Chi-square statistics = 19.761					
p-value = 0.000*					
Head of family gender					
Male	155	34.9	289	65.1	444
Female	15	26.8	41	73.2	56
Chi-square statistics = 1.463					
p-value = 0.227					

*significant at 5% level

4.5 Investigating the Relationship Between Level of Satisfaction Towards Existing House Condition and Their Profile

These investigations were conducted to determine whether there exist the relationship between levels of satisfaction towards present house and their profile. To conduct these tests, Chi-square test of association was used and the null and alternative hypotheses were outlined:

Ho: There is no significant relationship between level of satisfaction and district

$H_{1:}$ There is a significant relationship between level of satisfaction and district

Ho: There is no significant relationship between level of satisfaction and type of house

$H_{1:}$ There is a significant relationship between level of satisfaction and type of house

Ho: There is no significant relationship between level of satisfaction and house ownership

$H_{1:}$There is a significant relationship between level of satisfaction and house ownership

The results of the tests are tabulated in Table 4.7, which shows that 'district' and 'type of house' has a significant relationship with level of satisfaction towards existing house. However, 'house ownership' do not seem to show any relationship with their level of satisfaction. In other word, house status does not affect respondent's level of satisfaction towards their current house condition.

Table 4.7: Summary Result of Chi-Square Test of Association

Profile	Chi-square statistics	p-value
District	6.441	0.011*
Type of house	17.226	0.001*
House status	4.932	0.085

*significant at 5% level

Table 4.8 shows the cross-tabulation of the relationship between level of satisfaction towards existing house condition and district. Baling's residents are more satisfied with their existing house condition as compared to Padang Terap. Table 4.9 shows the cross-tabulation of the relationship between degrees of satisfaction towards their type of houses. For those who live in single-storey terrace house, they seem to be more satisfied

with existing environment of their houses as compared to those who live in village houses.

Table 4.8: Cross-Tabulation of Level of Satisfaction and District

		District		Total
		Baling	Padang Terap	
Level of satisfaction	NO	82	110	192
		(32.8%)	(43.8%)	(38.32%)
	YES	168	141	309
		(67.2%)	(56.2%)	(61.7%)
Total		250	251	501
		(100%)	(100%)	(100%)

Table 4.9: Cross-Tabulation of Level of Satisfaction and Type of House

		Type of house			Total
		Village house	Terrace house	Gov. Quarters	
Level of satisfaction	No	189	1	2	192
		(38.4%)	(14.3%)	(100.0%)	(38.3%)
	Yes	303	6	0	309
		(61.6%)	(85.7%)	(0.0%)	(61.7%)
Total		492	7	2	501
		(100%)	(100%)	(100%)	(100%)

There is a significant gap between the level of satisfaction with their current village houses. 38.4 percent expressed their discontentment on the deteriorating of their inherited houses since they are not able to obtain loan easily to repair such works. There are also displeasures on the modern development that are taking place in their area, which causes environmental impact. The other 61.6 percent that are satisfied is due to the fact that mostly are just accepting their condition as fate and with whatever that they own is sufficient. Refer to Figure 4.4 for reasons given for being satisfied with present house.

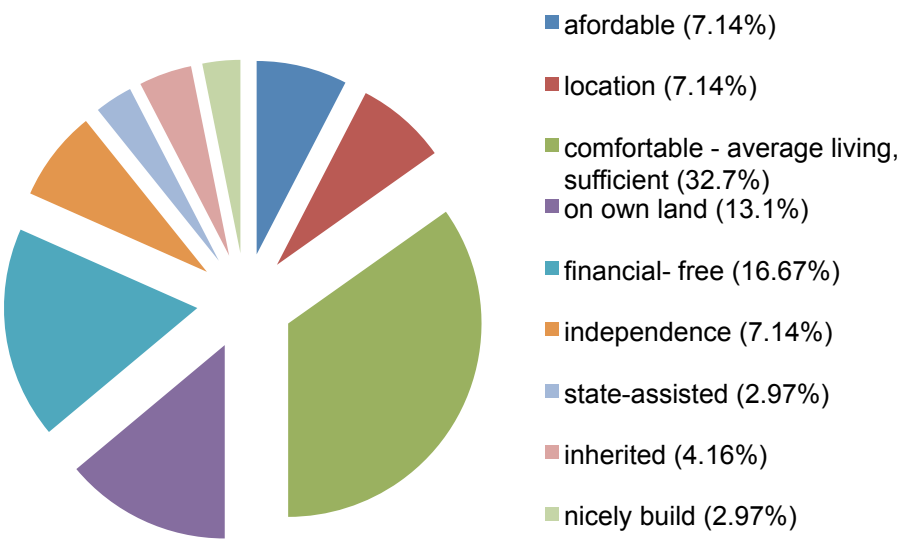

Figure 4.4: Reasons of Satisfaction on Current House

4.6 Investigating Relationship Between Self Build House Concept Awareness and Their Profile

These investigations were conducted to determine whether there exist the relationships between self build house concept awareness and their profile. Chi-square test of association was used with the null and alternative hypotheses to perform this test were:

Ho: There is no significant relationship between self build house concept awareness and district

$H_{1:}$ There is a significant relationship between self build house concept awareness and district

Ho: There is no significant relationship between self build house concept awareness and type of house

$H_{1:}$ There is a significant relationship between self build house concept awareness and type of house

Ho: There is no significant relationship between self build house concept awareness and education level

$H_{1:}$ There is a significant relationship between self build house concept awareness and education level

The results of the tests are tabulated in Table 4.10, which shows that 'district' and 'education level' has a significant relationship with awareness towards self build house concept. However 'age group' and 'type of house' do not seem to show any relationship with their level of awareness. In other words, 'age group' and 'type of house' does not affect the level of awareness of rural low-income household towards self build house concept.

Table 4.10 Summary Result of Chi-Square Test of Association

Profile	Chi-square statistics	p-value
District	17.189	0.000*
Education level	15.321	0.002*
Age group	9.208	0.056
Type of house	2.852	0.240

*significant at 5% level

Table 4.11 shows the cross-tabulation of the relationship between level of awareness towards self build house concept and district. Baling's residents are more alert with the concept of self build housing as compared to Padang Terap' residents. Table 4.12 shows the cross-tabulation of the relationship between level of awareness towards self build house concept and their education level.

It is observed that those with primary education consist of majority of the respondent which is 49.4 pecent (245 respondents), of which more than half (55.9 pecent) are aware of the concept of self build. Second highest number of respondents has secondary level of education background (42.7 percent) which boasts 66 percent that are aware of self build concept as one of the housing approach.

Table 4.11: Cross-Tabulation of Level of Awareness and District

		District		Total
		Baling	Padang Terap	
Level of awareness	No	79	125	204
		(31.6%)	(49.8%)	(40.7%)
	Yes	171	126	297
		(68.4%)	(50.2%)	(59.3%)
Total		250	251	501
		(100%)	(100%)	(100%)

Table 4.12: Cross-Tabulation of Level of Awareness and Education

		Level of Education				Total
		Primary school	Secondary school	Tertiary	No formal schooling	
Level of awareness	No	108	72	2	21	203
		(44.1%)	(34.0%)	(25.0%)	(67.7%)	(40.9%)
	Yes	137	140	6	10	293
		(55.9%)	(66.0%)	(75.0%)	(32.3%)	(59.1%)
		(100%)	(100%)	(100%)	(100%)	(100%)
Total		245 (49.4%)	212 (42.7%)	8 (1.6%)	31 (6.2%)	496 (100%)

4.7 Identify Rural Low-Income Affordable Range of Property

In this study, low-income household are referring to the total income of all members in the family which is below RM1,500 per month. Therefore, it is important to see the range of price that can be categorised as affordable for this group. Figure 4.5 identifies the range of property that is affordable to rural low income households. Almost half (48.3 percent) of the rural low-income earners in Malaysia could only afford to pay between RM10,000 to RM30,000 for a completed low-cost house. A quarter (25.7 percent) of them are willing to spend between RM30,000 to RM50,000. While only a small percentage (5.5 percent) could afford to spend more than RM50,000.

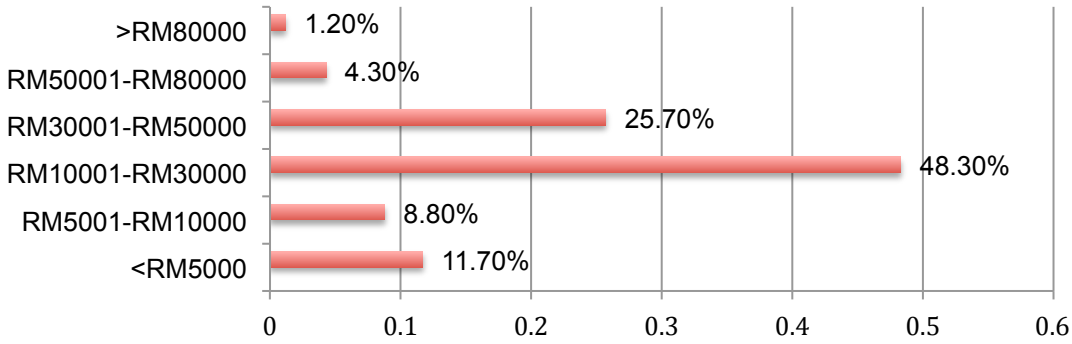

Figure 4.5: Range of Price Affordable to the Low-Income Household

4.8 Investigating Relationship Between Ease of Renovation and the Need for Additional Space

These investigations were conducted to determine whether there exist the relationship between ease of renovation and the need for additional space. This investigation requires Chi-square test of association to be used and the null and alternative hypotheses were:

Ho: There is no significant relationship between ease of renovation and the need for additional space

$H_{1:}$ There is a significant relationship between ease of renovation and the need for additional space

The results of the tests are tabulated in Table 4.13, which shows that 'ease of renovation' and 'the need for additional space' has significant relationship. Table 4.14 shows the cross-tabulation of the relationship between 'ease of renovation' and 'the need for additional space'. This study reveals that the need for additional space comes from the ease of the house to renovate.

Table 4.13: Summary Result of Chi-Square Test of Association

	Chi-square statistics	p-value
Easy to renovate * Need addition space	27.454	0.000*

*significant at 5% level

Table 4.14: Cross Tabulation of Ease to Renovate and the Need for Additional Spaces

		I need addition space in my existing house		Total
		No	Yes	
Technically, my existing house is easy to renovate	No	47	50	97
		(34.6%)	(13.7%)	(19.4%)
	Yes	89	314	403
		(65.4%)	(86.3%)	(80.6%)
Total		136	364	500
		(100%)	(100%)	(100)

It is concluded here that majority of respondents (72.8%) wished to renovate their current homes but 13.7% experience difficulty to extend or renovate it due to several factors.

4.9 Identify Problems (Other Than Technical) to Renovate Existing House

Figure 4.6 demonstrates the percentage that the respondents encountered before begin to renovate their houses. Apart from technical and construction problems, majority of the low-income earners are also facing other problems as well. Therefore, it is critical to identify which problem could be a threat to the idea of self build concept. The result can be seen in Table 4.15. The problem was earlier identified in most of the literature reviews. They consistently mentioned about financial assistance, construction materials, labour, freedom of space planning and infrastructure connectivity (Sulaiman & Yahaya, 1987; Yeboah, 2005; Martinez, 2001; Stallen et. al., 1994; Murdoch & Abrams, 1998; Diaz-Puente et. al., 2009; Madsen & Adriansen, 2004; Peattie, 1982; Ebrahim, 2009; Jaafar, 2001; Breyer, 2005). Due to its frequencies on the problems

arises in low-cost housing, the study has narrowed down by identifying some of the repeatedly mentioned.

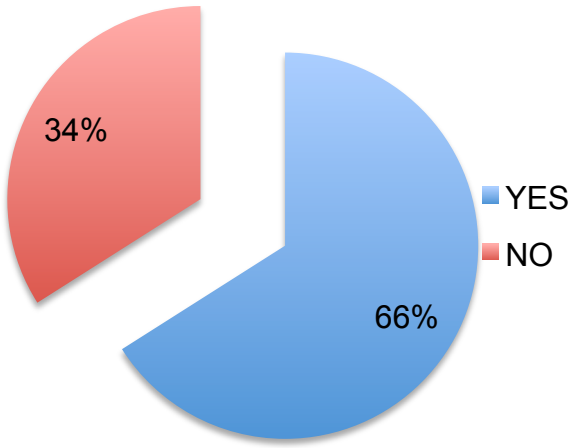

Figure 4.6: Percentage of Respondents that Encounter Problems to Renovate

Table 4.15: Ranking of Renovation Problem

Rank	Problem	Total score
1	Financial	406
2	Expensive construction materials	845
3	Manpower	1060
4	Limited space	1162
5	Infrastructure (road, electricity, water & sewerage)	1524

Financial capacity is the top most problem faced by the low-income earners when they want to renovate their homes. This is clearly understood due to the fact that majority of them earns below RM1,000 a month. Second highest problem that the respondents have to deal with is the fluctuation of the cost of the building materials. During the period of this interview, the price of steel, cement and sand have increased ranging from 5 to 10 fold due to the high demand from other construction-driven countries, resulting in local millers averting supply to export markets. Hence, this has created an artificial shortage at national level (Master Builders Association Malaysia, 2007). The next problem is followed by 'manpower', 'limited land area' and finally 'infrastructure'. Manpower refers to participation from relatives and neighbours,

whereby the need to start their daily work is greater than participating in self build construction, unless monetary consolation are involved. In rural area, most of the land is owned by these individuals. They usually have more than one household building a house on it due to family relations or renting out partial of their land. Therefore, increasing the physical size of the house creates a predicament for the either the owner of the land or the tenant. With the current development in Kedah, most area in rural districts have sufficient infrastructure provided for them by the government. Except in some cases, tarred roads are not 100 percent made available for their accessibility. As a result, some respondents depend on motorcycles to carry construction materials into their sites.

4.10 Identify Renovation Choices

It is imperative to know which of the spaces in their homes they would prioritise to build first as compared to other spaces. This is to understand and develop a flexible system that could accommodate their needs. Using ranking of total score, rural low-income earners consider kitchen area as the most important part of the house to renovate first when they could afford it. They need a bigger space where they can prepare daily meals for the family as well as having gatherings among neighbours for special occasions. The second choice of renovation is living hall. This is the place where they convene with families during recreational and resting hours. Both spaces are classified as public spaces where activities and communication within families are happening. Other spaces such as bedroom, washroom, dining hall and family hall are considered to be less significant. Refer to Table 4.16 for the total score according to choice of ranking. During the interview, it is observed that the respondents do not respond dining and family hall as a needed space since the living hall is sufficient to meet their needs.

Table 4.16: Ranking Of Choices Of Spaces To Be Renovated

Rank	Renovation choices	Total score
1	Kitchen	1271
2	Living hall	1325
3	Bedroom	1604
4	Wash room	1721
5	Dining hall	2136
6	Family hall	2440

4.11 Investigating Relationship Between Involvement and Willingness to Join Mutual Help

The survey conducted to determine whether there exist any relationship between involvement and willingness to join mutual help. Chi-square test of association is again applied to conduct these tests with the null and alternative hypotheses are:

Ho: There is no significant relationship between experience of involvement and willingness to join mutual help.

$H_{1:}$ There is a significant relationship between experience of involvement and willingness to join mutual help.

The results of the tests are tabulated in Table 4.17, which shows that between 'experiences of involvement in mutual help', and 'willingness to join mutual help' has a significant relationship. Table 4.18 shows the cross-tabulation of the relationship between 'involvement in mutual help' and 'willingness to join mutual help'. This study reveals that those who are willing to join mutual help are those who have had experience in these programs.

Table 4.17: Summary Result of Chi-Square Test of Association

	Chi-square statistics	p-value
Experience of involvement* Willingness to join	22.513	0.000*

*significant at 5% level

Table 4.18: Cross Tabulation of Involvement and Willingness to Join Mutual Help

		Willingness to join mutual help		Total
		No	Yes	
Experience of Involvement in mutual help	No	67	143	210
		(62.0%)	(36.6%)	(42.1%)
	Yes	41	248	289
		(38.0%)	(63.4%)	(57.9%)
Total		108	391	499
		(100%)	(100%)	(100%)

4.12 Identify Reasons for Willingness to Join Mutual Help

Generally, mutual help is conducted in the voluntary basis. Therefore, it is useful to understand the reasons for their willingness to join mutual help. The result can be seen in Table 4.19. The main reason for their willingness is to 'Strengthen the relationship among communities'. Besides that, they are also willing to participate because it is 'cheap and cut the cost of house ownership'. It followed by 'able to plan the space/room according to their family need' and 'able to get more space for their house'.

Table 4.19: Reason for Willingness to Join Mutual Help

Rank	Reason	Total score
1	Strengthen the relationship among communities	555
2	Cheaper and cost efficient in owning a house	796
3	Able to plan spaces to suit family needs	1198
4	Able to obtain more built up area	1351

4.13 Identify Rural Low-Income Owning a House

If they were given the option of owning a house, the rural low-income earners would prefer to upgrade the existing house instead. The fact that they have limited financial resources, a few did express their satisfaction of being able to even have a house at all. This is related to what Turner (1976) recommended, namely that people should be given land and opportunity to build houses of their own choice. The choice is followed by *building their own house with families and neighbours*. As this option rationalise a cheaper method to own a house.

This confirms the argument of Maasdorp and Haarhoff (1983) that security of tenure is the most important measure of household satisfaction and that it stimulates personal investment in housing which would otherwise not be possible. The third option they will take is to hire contractors to build their houses. They will opt to buy a completed unit as their last choice. This discloses that the rural low-income earners will go for the cheapest scheme available to fit their financial status. Refer to Table 4.20.

Table 4.20: Option of Owning House

Rank	Option owning house	Total score
1	Upgrade the existing house	927
2	Built own house with family and neighbor	1269
3	Hire contractors to build house	1317
4	Buy complete build house	1497

4.14 Identify Level of Acceptance Towards Self Build House

Factor analysis was carried out to determine the level of acceptance towards the self build house concept. A principal component analysis for extraction and varimax rotation methods were used for factor analysis. Before conducting factor analysis, two

statistical measurements should be checked; the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlet's test of sphericity. A high value of KMO (close to 1.0) and the significant p-value (p-value < 0.05) of the Bartlett's test indicate that factor analysis is useful to be carried out.

4.14.1 Results of Factor Analysis

Figure 4.7 shows the result of the two statistical measurements. KMO statistic was high (0.803) and the Bartlett's test was significant (p-value < 0.05) suggested that factor analysis was useful to be carried out.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.803
Bartlett's Test of Sphericity	Approx. Chi-Square	1522.540
	df	153
	Sig.	.000

Figure 4.7: KMO and Bartlett's Test Result

Table 4.21 shows the rotated matrix component for the five factors extracted with their respective factor loadings.

Table 4.21: Factor Loading

Factors	Factor loadings				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Self build housing gives me the freedom to design my own house.	0.736				
Programs for self build housing give advantages to participants.	0.620				
Self build housing program strengthens community ties.	0.618				
Self build housing is an approach to own houses the easier way.	0.612				

Table 4.21: continued

Factors	Factor loadings				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
I feel satisfied if i could build my own house compared to contractor-built low-cost houses.	0.607				
I believe that self build housing is an effort that benefits all parties.	0.480				
My family and i will lend a hand to those who wants to build their own house.		0.754			
I am willing to spare my time to help my neighbours to build their houses.		0.695			
The community in my village will assist anyone who wants to build their own houses.		0.674			
The community in my village helps each other.		0.537			
If the local government coordinates a self build housing program, i would participate in the exercise.			0.726		
I agree to take up housing loans to build my own house.			0.617		
I am willing to participate in the self build housing program.			0.557		
I am interested to know more about the concept of self build housing.			0.464		
I prefer to hire a contractor or a carpenter compared to building my house.				0.749	
I have no spare time to build my own house.				0.723	
Self build housing delays house ownership.					0.754
I am able to construct my own house with the help from my neighbours.					0.595

As shown, Factor 1 comprised five items with factor loadings ranged in size from 0.480 to 0.736. This factor was named benefits of self build house concepts. Factor 2

was made up of three items with factor loadings ranged from 0.537 to 0.754 and could be labelled as willingness to participate in self build housing. Three items with factor loadings ranged from 0.617 to 0.749 loaded on the third factor and was named self-interest and government support. Factor 4 was labelled time restriction and Factor 5 contained two items with factor loading of 0.754 and 0.595. Factor 5 was labelled involvement of other parties. The five factors extracted explained 50 percent of the total variance.

4.15 Identify Characteristics of Choice of Property

There are some characteristics that influence the choice of property. Although it is subjected to the individual, there are some characteristics that become major concern. The result is shown in Table 4.22. Location is the top most priority for rural low-income earners to consider in their choices of property. Since they require their homes to be nearby to where they work. It is followed by the design of the house along with construction materials used and floor space offered. Type of the house is the last considered choice among rural low-income earners.

Table 4.22: Characteristics of Property

Rank	Influence in choice of properties	Total score
1	Good location	1165
2	Interesting design	1417
3	Construction materials used	1572
4	Total build-up area	1635
5	Type of house offered	1696

4.16 Investigating Relationship Between Skills and Experience in Constructions

The investigations conducted were to determine whether there exist the relationships between skills and experience in constructions. This is on the assumption that skills develop through the experience of doing things. To conduct these tests, Chi-square test of association was used and the null and alternative hypotheses were:

Ho: There is no significant relationship between skills and experience in constructions.
$H_{1:}$ There is a significant relationship between skills and experience in constructions

The results of the tests are tabulated in Table 4.23, which shows that skills and experience in constructions has significant relationship. 95 percent of those who have skills in constructions are the one who have experience. This finding matches the assumption that skills are developed through experiences. Refer Table 4.23.

Table 4.23: Summary Result of Chi-Square Test of Association

	Chi-square statistics	p-value
Skills*Experience	321.339	0.000*

*significant at 5% level

Table 4.24: Cross Tabulation of Skills and Experience in Constructions

		I have the skills on self build house		Total
		No	Yes	
I have experience on self build house	No	199	12	211
		84.0%	4.6%	42.3%
	Yes	38	250	288
		16.0%	95.4%	57.7%
Total		237	262	499
		100%	100%	100%

4.17 Identify the Types of Training Needed

In order to establish the self build group a success, it is crucial to identify types of training needed for low-income earners. Leadership and supervision from third parties are needed due to their low level of income and education. Table 4.25 summarises the result of the type of training the respondents believe that they would need.

Financial training is the most training needed. It involves financial management and also the financial advice on loan. In addition on financial training, the low-incomers need training on the planning to start the program.

Table 4.25: Type of Training Needed

Training	Percent
Financial management	79%
Planning to start group self build house program	76%
Financial advice on loan	72%
House building method	65%
Making construction items	58%

4.18 Identify the Ability to Read House Plan

Almost 60 percent of the rural low-income households have the ability to read house plan. It shows that they are able to identify the basic spaces and components such as doors and windows that need to be constructed. 41 percent of the rural low-income earners do not have this skill. However, this aptitude can be learnt through training. Refer to Figure 4.8.

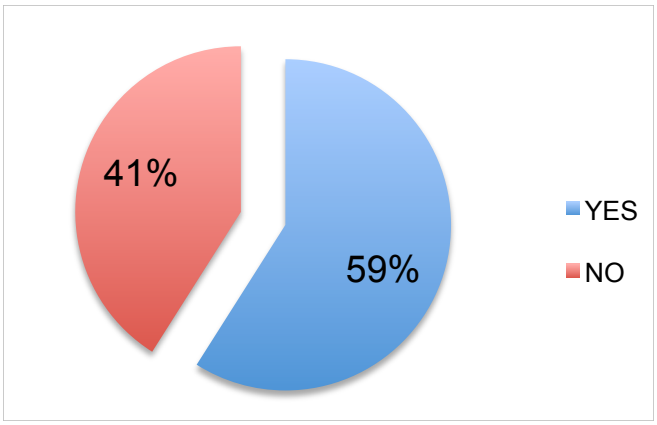

Figure 4.8: Ability to Read House Plan

4.19 Identify Construction Materials That are Easy to Work With and Affordable

Rural low-income earners consider brick as the easiest construction material to work with and among the most affordable material to purchase. Even timber is considered to be second material that is straightforward to work with but apparently it is not perceive as an affordable material as compared to concrete. The most expensive construction material perceived by the respondents is glass. Meanwhile, bamboo is considered to be as the most complex construction materials to work with considering the process from acquiring the material up to preparing it for usage in housing construction. Refer Table 4.26.

Table 4.26: Type of Construction Items

Easy to work with		Construction materials	Affordable to buy	
Total score	Rank		Rank	Total score
842	1	Bricks	1	869
1295	2	Timber	3	1879
1371	3	Concrete	2	1273
1769	4	Steel	4	2009
2580	5	Glass	6	2061
2638	6	Bamboo	5	2385

4.20 Identify Factors That Determine the Demand of House

Factor analysis was carried out to determine the factors that affect the demand of a house. A principal component analysis for extraction and varimax rotation methods were used for factor analysis. Before conducting factor analysis, two statistical measurements should be checked; the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlet's test of sphericity. A high value of KMO (close to 1.0) and the significant p-value (p-value < 0.05) of the Bartlett's test indicate that factor analysis is useful to be carried out.

4.20.1 Results Of Factor Analysis

Figure 4.9 shows the result of the two statistical measurements. KMO statistic was high (0.803) and the Bartlett's test was significant (p-value < 0.05) suggested that factor analysis was useful to be carried out.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.672
Bartlett's Test of Sphericity	Approx. Chi-Square	989.307
	df	120
	Sig.	.000

Figure 4.9: KMO and Bartlett's test result

Table 4.27 shows the rotated matrix component for the five factors extracted with their respective factor loadings.

Table 4.27: Factor loading

	Estimated rotated factor loadings					
	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**	**Factor 6**
I am willing to exploit new building materials in the market to build my own house.	0.752					
I am willing to try out new building techniques to build a house.	0.723					
I am willing to share the building materials together with my neighbour.	0.587					
I am able to seek my own building materials.	0.460					
I am willing to make my own building materials.	0.411					
The affordable housing provided by the government has acceptable qualities.		0.803				
I am satisfied with the design of the public low cost houses.		0.731				
The affordable housing provided by the government is affordable.		0.654				
Total built up area is my main criteria of owning a house.			0.668			
I will be satisfied if i can control the construction quality of my house.			0.645			
I definitely would improve the low-cost house i purchased.			0.522			
The selection system to buy a low-cost house is a taxing for me.				0.830		
I agree that the size of low cost housing is insufficient.				0.747		

Table 4.27: continued

	Estimated rotated factor loadings					
	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**	**Factor 6**
I think timber houses are for poor people only.					0.784	
I believe living in a concrete/masonry house shows the household status.					0.735	
I believe the construction materials used in low-cost housing is the reason that made them expensive.						0.841

From Table 4.27, the six factors collectively account for 58 percent of the total variance in 16 variables. Factor 1 comprised five items with factor loadings ranged in size from 0.411 to 0.752. This factor was named package of the house. Factor 2 was made up of three items with factor loadings ranged from 0.654 to 0.803 and could be labelled as comfort ability. Four items with factor loadings ranged from 0.552 to 0.668 loaded on the third factor and was named willingness to try new approach. Factor 4 was labelled selection and design. Factor 5 contained two items with factor loading of 0.734 and 0.784. Factor 5 was labelled social status and Factor 6 was labelled quality of items. Table 4.28 show the custom factor name given to summarize the variables.

Table 4.28: Custom Name of the Factor

Custom criteria	Corresponding variables
Perception of public low cost housing	The affordable housing provided by the government has acceptable qualities.
	I am satisfied with the design of the public low cost houses.
	The affordable housing provided by the government is affordable
Comfort ability	I will be satisfied if i can control the construction quality of my house.
	Total built up area is my main criteria of owning a house.
	I definitely would improve the low-cost house i purchased.

Table 4.28: continued

Custom criteria	Corresponding variables
Willingness to try new approach	I am willing to try out new building techniques to build a house.
	I am willing to exploit new building materials in the market to build my own house.
Selection and design	The selection system to buy a low-cost house is a taxing for me.
	I agree that the size of low cost housing is insufficient.
Social status perception	I think timber houses are for poor people only.
	I believe living in a concrete/masonry house shows the household status.
Quality of construction	I believe the construction materials used in low-cost housing is the reason that made them expensive.

The reliability of the scale coefficients were summarized in Table 4.29. The alpha's coefficients for perception of public low cost housing, comfort ability, willingness to try new approach, selection and design and social status perception were moderate (above 0.50) and hence reliable. However, the alpha's coefficient for quality of construction could not be computed as it had only one item and thus not reliable. It was excluded for further analysis. The mean scores were computed for each factor. Then, the scores were recoded to the original scale of 1 to 5 and used for further analysis.

Table 4.29 Summary of Reliability Coefficients

Factor	Number of items	Alpha's coefficient
Willingness to try new approach	5	0.562
Perception of public low cost housing	3	0.603
Comfort ability	3	0.555
Selection and design	2	0.53
Social status perception	2	0.52
Quality of construction	1	-

4.20.2 Exploring Characteristics of Data

It is important to check the characteristics of data before carrying any statistical tests. The purpose is to determine the approach of the statistical tests used whether parametric

or nonparametric tests. In this study, the distributions of the factor that affect the demand of housing were assessed using Kolmogorov-Smirnov test. If the p-value of the test is less than 0.05, level of significance, the distribution is assumed to be normal. The results of the Kolmogorov-Smirnov test were summarised in Table 4.30.

Table 4.30: Summary of results of Kolmogorov-Smirnov test

Factor	p-value
Willingness to try new approach	0.000
Perception of public low cost housing	0.000
Comfort ability	0.000
Selection and design	0.000
Social status perception	0.000

*significant at 5% level

The results showed that all the variables were not normally distributed since the p-values were significant (p-value < 0.05). Thus, non-parametric tests were performed to test all the hypotheses involved in this study.

4.21 Identify Factors That Affect the Housing Demand According to Their Profile

4.21.1 District

The Kruskal-Wallis test was then carried out to investigate whether factors that affects the housing demand is significantly different between districts. The alternative hypotheses (H_1) being investigated was as follows;

a. H_1: There is a significant difference of willingness to try new approach between districts.
b. H_1: There is a significant difference of perception of public low cost housing between districts.
c. H_1: There is a significant difference of comfort ability of the house between districts.

d. H_1: There is a significant difference of selection and design between districts.

e. H_1: There is a significant difference of social status perception between districts.

The null hypothesis (H_0) of no significant difference will be rejected if the p-value of the Kruskal-Wallis test is less than 0.05, level of significance. The results of the test are summarised in Table 4.31.

Table 4.31: Summary of Result of the Kruskal-Wallis Test

Factor	Chi-square statistics	p-value
Willingness to try new approach	9.68	0.00
Perception of public low cost housing	4.73	0.03
Comfort ability	7.22	0.01
Selection and design	0.11	0.74
Social status peception	61.88	0.00

*significant at 5% level

Table 4.31 reveals that the willingness to try new approach, perception of public low cost housing, comfort ability and social status were significantly different between districts (p-value < 0.05). However, selection and design *of the house* was not significantly differs between districts (p-value > 0.05). Table 4.32 also depicts the mean rank of the factors affecting the demand of the house between districts.

Table 4.32: Mean Rank Of The Factors Affecting The Demand Of The House Between Districts

Factor	District	Mean Rank
Willingness to try new approach	Baling	270.3
	Padang Terap	230.9
Perception of public low cost housing	Baling	237.4
	Padang Terap	264.6
Comfort ability	Baling	267.9
	Padang Terap	234.2
Selection and design	Baling	249.0
	Padang Terap	253.0
Social status perception	Baling	297.0
	Padang Terap	205.2

This only shows that Baling residents are more concern towards comfort ability, social status and they are more open to the new approach as compared to Padang Terap residents. This study also reveals that Padang Terap residents are more receptive towards the features of low cost houses has to offer.

4.21.2 Age Group

The Kruskal-Wallis test was then carried out to investigate whether factors that affects the housing demand is significantly different between age group. The alternative hypotheses (H_1) being investigated was as follows;

a. H_1: There is a significant difference of willingness to try new approach between age group.
b. H_1: There is a significant difference of perception of low cost housing between age group.
c. H_1: There is a significant difference of comfort ability of the house between age group.
d. H_1: There is a significant difference of selection and design between age group.
e. H_1: There is a significant difference of social status perception between age group.

The null hypothesis (H_0) of no significant difference will be rejected if the p-value of the Kruskal-Wallis test is less than 0.05, level of significance. The results of the test are summarised in Table 4.33.

Table 4.33: Summary of Result of the Kruskal-Wallis Test

Factor	Chi-square statistics	p-value
Willingness to try new approach	14.07	0.01*
Package of house	5.25	0.26
Comfortability	4.34	0.36
Selection and design	0.39	0.98
Social status	10.64	0.03*

*significant at 5% level

Table 4.33 reveals that the willingness to try new approach and social status were significantly different between age groups (p-value < 0.05). However, package of the house, comfortability and selection and design of the house was not significantly differs between age group (p-value > 0.05). Table 4.34 depicts the mean rank of the factors affecting the demand of the house between age group. Younger age group (less than 30 years old) are being identified as the group who are willing to try new approach. However the older generations (more than 60 years old) are more concern about the perception of social status.

Table 4.34: Mean Rank of the Factors Affecting the Demand of the House Between Age Group

Factor	Age group	Mean Rank
Willingness to try new approach	Less than 30	301.7
	30-39	268.9
	40-49	252.2
	50-59	251.6
	Above 60	208.6
Perception of low cost housing	Less than 30	262.8
	30-39	243.0
	40-49	243.7
	50-59	266.0
	Above 60	228.3
Comfort ability	Less than 30	268.4
	30-39	258.0
	40-49	262.8
	50-59	235.4
	Above 60	239.2
Selection and design	Less than 30	253.9
	30-39	248.6
	40-49	243.8
	50-59	250.1
	Above 60	253.5
Social status perception	Less than 30	258.3
	30-39	256.3
	40-49	228.5
	50-59	242.8
	Above 60	281.7

4.21.3 Affordability

The Kruskal-Wallis test was then carried out to investigate whether factors that affect the housing demand is significantly different between the amounts of money that rural low income earners afford to pay. The alternative hypotheses (H_1) being investigated was as follows;

a. H_1: There is a significant difference of willingness to try new approach between affordable amount

b. H_1: There is a significant difference of package of the house between affordable amount

c. H_1: There is a significant difference of comfortability of the house between affordable amount

d. H_1: There is a significant difference of selection and design between affordable amount

e. H_1: There is a significant difference of social status between affordable amount

The null hypothesis (H_0) of no significant difference will be rejected if the p-value of the Kruskal-Wallis test is less than 0.05, level of significance. The results of the test are summarised in Table 4.35.

Table 4.35 Summary of Result of the Kruskal-Wallis Test

Factor	Chi-square statistics	p-value
Willingness to try new approach	17.42	0.00*
Perception of low cost housing	2.35	0.80
Comfortability	32.13	0.00*
Selection and design	9.16	0.10
Social status perception	9.59	0.10

*significant at 5% level

Table 4.35 reveals that the willingness to try new approach and comfortability were significantly different between affordable amounts (p-value < 0.05). However, package

of the house, social status and selection and design of the house was not significantly differs between affordable amounts (p-value > 0.05). Table 4.36 depicts the mean rank of the factors affecting the demand of the house between age group. In general, those who are willing to spend more than RM80,000 are open for the new approach or techniques available. However, the rural low-income earners are willing to spend between RM 50,000 to RM80,000 for a comfortable house which they are familiar with the ability of the construction materials. They tend to be doubtful when new ideas of building a house or new materials to be used in house constructions are introduced to them. Comments such as “can the house with hold the structure and weight”, “can the house with hold the weather” or “can the house be built at all” are the most common remarks made by those who had experience

in construction.

Table 4.36: Mean Rank of the Factors Affecting the Demand of the House Between Affordable Amounts

Factor	Affordability	Mean Rank
Willingness to try new approach	< RM5,000	193.6
	RM5,001-RM10,000	247.5
	RM10,001-RM30,000	234.2
	RM30,001-RM50,000	273.8
	RM50,001-RM80,000	267.4
	>RM80,000	327.8
Perception of low cost housing	< RM5,000	250.1
	RM5,001-RM10,000	248.1
	RM10,001-RM30,000	238.7
	RM30,001-RM50,000	243.8
	RM50,001-RM80,000	259.3
	>RM80,000	313.8
Comfortability	< RM5,000	177.9
	RM5,001-RM10,000	188.3
	RM10,001-RM30,000	253.2
	RM30,001-RM50,000	267.7
	RM50,001-RM80,000	312.5
	>RM80,000	177.5
Selection and design	< RM5,000	245.8
	RM5,001-RM10,000	207.1
	RM10,001-RM30,000	250.7
	RM30,001-RM50,000	254.2
	RM50,001-RM80,000	188.4
	>RM80,000	211.8

Table 4.36: continued

Factor	Affordability	Mean Rank
Social status perception	< RM5,000	202.2
	RM5,001-RM10,000	272.9
	RM10,001-RM30,000	240.1
	RM30,001-RM50,000	225.8
	RM50,001-RM80,000	185.8
	>RM80,000	218.5

4.22 Chapter Summary

The research has established a number of factors that affect the preferences of adopting self build housing approach among the low income group in the rural area. Owning a house is crucial despite however much a family earns and in whichever location they are given. The younger generation (age group less than 39 years old) was more optimistic in response towards self build approach as compared to the older groups (age group more than 40 years old). This is due to educational background of having to complete education level at minimum a form 3 schooling and the need to be independent from their parents' support. It is also important that the houses they are investing should be within the range of RM30,000.

A crucial factor to enable low-income families to participate in the gradual development of their homes is to find a link between their building activities and those of the large-scale building sector. Amidst technological development and increasing demand for housing, the large-scale sector, such as local authorities and private developers, resorted to industrialised housing to replace traditional and conventional building materials and methods. Industrialisation, however, resulted not only in expensive and inappropriate dwellings but also eliminated homeowners from the building process and management of their homes. For those who have had the

experience involved in mutual help, are willing to join in similar activities. Reason being that through such activities, a family is able to add more spaces needed.

On the issue of self build housing as an alternative, the factor loading showed that respondents observed heavily that self build housing gives them the freedom in designing their own home, their willingness to lend a hand to others who wants to build a house and would participate in programs if local government coordinates these kind of activities. On the other hand, the respondents are also sympathetic on their preference to hiring a contractor as they have limited time to build their own homes. This lead to believe that construction process would delay them to move in quickly. Hence, the type of house offered seems to be the factor that would influence their choice of properties.

There have been numerous innovative building systems for housing developed in Malaysia in the last two decades. Private entrepreneurs develop these building systems either promoting locally invented systems or adapting imported versions (Lindfield, 1984). While most self build houses internationally are using materials that are locally available or inventing recycling new materials, it does not seem to be a priority among the respondents to be learning or spending too much time in making construction materials. Instead, they favour for training on financial management more.

Therefore any simplified systems that are locally adaptable should be an asset to organize self build housing. 60 percent of the respondents are able to read simple plans, making the task of self build housing much easier to execute. Even though brick seems to be the choice in ease of construction, but it requires concrete and plastering work in which some are not capable of handling, while timber is the second material to be chosen for its straightforwardness to work with.

All these have led the research to further explore in designing a system that can be employed for self build housing. The following chapter justifies the development of such system.