

Planning for Affordable Housing Unit in Duhok City

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Abstract- *Housing is a critical problem in the city of Duhokin Iraqi Kurdistan. A significant number of citizens of the governorate of Duhok have suffered from housing crisis for decades due to many reasons, such as socio- economic and political reasons namely, rapid population growth, immigration from rural area and inappropriate governmental housing policies. This research focuses on the affordability of housing units in Duhok city. The study involves a field study of two different projects, one vertical housing project, and another is horizontal housing project. The study aims to evaluate the affordability of these two projects as compared with international standards. The study surveys are carried out by a questionnaire with residents of these two projects and in-depth interview with experts. The findings of the study approved that; the two projects that have been studied are not affordable for low and middle income people. Finally the study provides recommendations for improving the affordability of the future housing projects.*

Keywords: *Affordable Housing Units, Housing Policy, Duhok City, DabinMasiki Housing Projects, Warvin City*

I. INTRODUCTION

The house provides a necessary foundation for all people to live during the social and physical actions [1]. The real estate market became more unstable since the economy of many countries increased dramatically. House became more expensive in many countries from the beginning of 21st century [2]. In developing countries there is a gap between high-income and low-income group. For low-income groups, to own a comfortable house became one of the unaffordable dreams in their lives. Providing affordable housing has become an urgent task for governments. Today, many governments around the world have realized it and have been planned to take more actions on it [3].

In Iraqi Kurdistan Region housing remains a critical issue, the cities in this region have been faced with a high urban growth rate and rapid urbanization in the last decade, this is due to the fact that the region has enjoyed relative peace and security as compared with other parts of Iraq [4]. According to the Ministry of Planning there is a significant housing deficit in Kurdistan, where there is a need to produce 250,000 housing units by the year 2016 [5]. The demand for housing in Duhok city was 43,032 units in 2012 and will be 50,600 units in 2017 therefore, 1500 units per year are needed to cover the growing wave [6]. This study aims to determine suitable

policies that can be adopted by KRG to provide affordable housing units in Duhok governorate.

II. THEORETICAL FRAMEWORK

1) Affordable housing

Affordable housing "is a significant part of social housing security protection, provided by local government to the customers who is low-income household or has lower competition power in social market. Affordable housing policy used to organize the social security system" [3].

2) Measuring Housing Affordability

Ratio Approach is the most commonly measurement of housing affordability, which illustrate the ratio of housing cost to household income [7]. More specially, the ratio is defined as the ratio of current median/mean market value of standard housing unit to median/mean income of the household [8]. Demographic and behavioral factors, migration, increased life expectancy, construction codes, a greater propensity for people to live alone, and young adults delaying forming their own household are the main factors affecting the overall volume of housing stock [9]. In general, affordable housing can be measured according to **three main factors**: Socio -Economic factors such as monthly income, family size; providing housing unit (Operation of process housing industry); Physical factors such as infrastructures, service, and location.

3) International Comparison of Affordability of Housing

Comparing the price-to-income ratio with the results came from the 10th Annual Demographic International Housing Affordability Survey. This survey employs the concept "**Median Multiple**". The Median Multiple indicator, recommended by the World Bank and the United Nations, rates affordability of housing by dividing the median house price by gross annual median household income, also known as the price-to-income ratio to rate housing affordability [10]. Table (1) reveals that the benchmark set by the international housing affordability survey. Housing affordability is to be severely unacceptable when the price-to-income ratio reaches 5.1 or more, and it's also identified as affordable when price-to-income ratio is less than or equal to 3 [11].

TABLE 1. DEMOGRAPHIC HOUSING AFFORDABILITY RATING Categories

No	Rating	Median Multiple=(Median House Price/Median Household Income)
1	Severely Unaffordable	5.1&over
2	Seriously Unaffordable	4.1-5.0
3	Moderately Unaffordable	3.1-4.0
4	Affordable	Less 3.0

4) Affordable Housing Operation

In any housing project there are five key inter-dependent components; *land, infrastructures, finance, labor, and construction materials*. Figure (1) illustrated that, as the pillars of the hexagon there is trend of housing market in any country. These components are organized and shaped by four groups of external forces that comprise the legal, regulatory and institutional frameworks within which they operate. These four forces are: *policies, strategies, instruments* (including pricing) and *actions*. As well as these forces are the four corners of the institutional content or environment which together may enable the provision of access to infrastructures, land, finance, construction, construction materials, and labors, as well as know-how by housing suppliers and housing consumers in a given market. Instability namely un equally, an unbalanced or inappropriate setting of these four forces can distort, constrict or suppress the development and growth of housing [12].

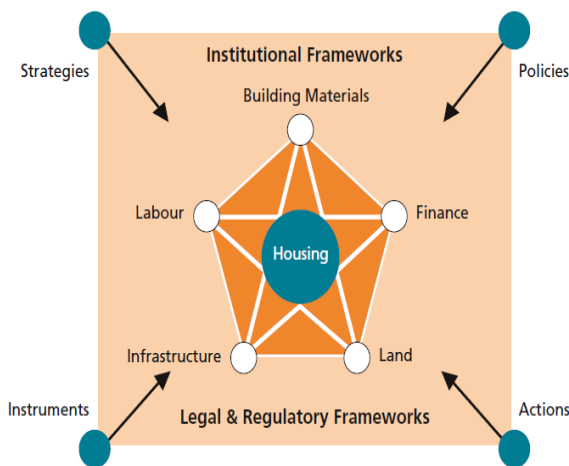


Figure 1. A Holistic and Multidimensional View of the Housing Sector [12].

III. METHODOLOGY

The current study attempted to examine the affordability in the housing policy in Duhok city. The study includes one (independent variable) governmental housing polices and one (dependent variable) affordability of housing units. Each of them can be measured by certain indicators as explained in the figure (2).

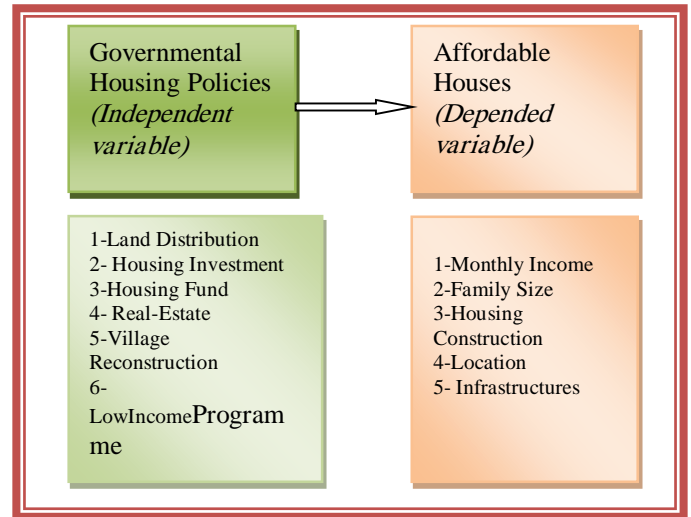


Figure 2. Study variables and indicators

1) Data Collection Methods:

In the current study, in order to measure study variables three data collection methods were used:

1. **Survey**, namely; questionnaire In order to get necessary data about the affordability of housing units. Based on previous section, the questionnaire forms were distributed over a sample of study and it took about thirty minute for each interview including closed questions. The form of questionnaire aimed to collect data related to: Socio-economic condition of residents: measuring affordable houses in this study involve monthly income, family size as a socio-economic indicators provision of housing units and basic infrastructures in project
2. **Content analysis**: Documents such as statistical data related to population growth, housing units, housing construction permissions, land distribution, housing investment projects in Duhok city, installment payments that are take from governmental directorates in Duhok city
3. **In-depth Interviews** were conducted with the persons who work in related governmental directorates in Kurdistan Region – Duhok governorate to evaluate housing policies and finding the solutions.

2) Case Study

The current research will focus on studying, analyzing, and evaluating of affordability of housing units in Duhok city. Accordingly, study select two housing projects in Duhok city as shown in figure (3).Based on the nature, the type of project, mainly one horizontal residential project and another vertical housing project. *Selection of housing project in the current study will depended on housing cost, payment method, government subsidies, design and location.*

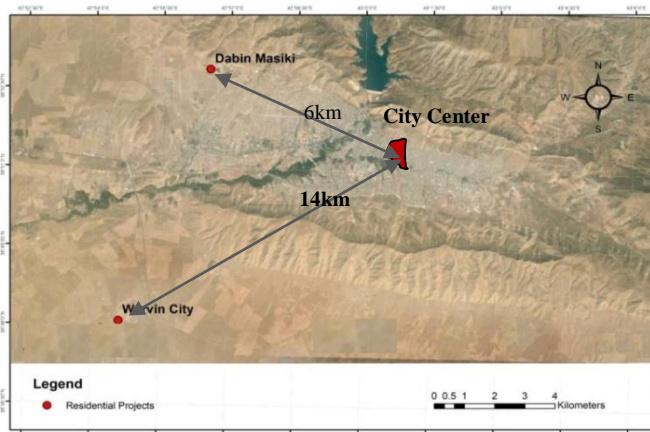


Figure 3. Location of both Two Projects from City Centre.

3) **Sample of Study**

In current study three samples were adopt for collecting necessary data and gathering opinion to measure the role of KRG housing policies in providing affordable house for citizens.

a-Sample to conduct in-depth interviews

10 experts from government institution, university and others were selected to gather opinion about effect of housing policies on the affordability of housing units in Duhok city.

b-Sample for DabinMasiki housing project

In order to collect necessary data for measuring affordability of housing in DabinMasiki, 100 households who live in DabinMasiki were selected (equivalent to 10% of residences of DabinMasiki) randomly [13].

c -Sample for Warvin City housing project

In order to collect necessary data for measuring affordability of housing in Warvin City, 50 households who live in Warvin City were selected (equivalent to 10% of residences of Warvin City) randomly [14].

IV. RESULTS AND DISCUSSION

Results of Questionnaire

1) Affordability Analysis According to Monthly Income for Households

1- In DabinMasiki

The income of the citizen in the study area is divided in to five groups as shown in table (2).

TABLE 2. THE MONTHLY INCOME OF EACH GROUP IN DABIN MASIKI

Item	Group 1	Group 1	Group 1	Group 1	Group 1
Monthly income IQD	Less than 500,000	500,000-1,000,000	1,000,000 - 1,500,000	1,500,000 - 2,000,000	More than 2,000,000
Type of income	Low incomes	Middle incomes	High incomes	High incomes	High incomes
percentage	28%	46%	22%	2%	2%

In order to measure affordability of housing units based on international standards, consideration 30% from monthly income of household comparing with payment cost amount and after analyzing necessary data related to the current study the affordability condition in (DabinMasiki) is considered affordable for 51% of residents (high income) It is not affordable for 49% of residents (low, middle income).

2- In Warvin City

The income of the citizen in the study area is divided in to four groups as shown in table (3).

TABLE 3. THE MONTHLY INCOME OF EACH GROUP IN WARVIN CITY .

Item	Group 1	Group 1	Group 1	Group 1	Group 1
Monthly income IQD	Less than 500,000	500,000-1,000,000	1,000,000 - 1,500,000	1,500,000 - 2,000,000	More than 2,000,000
Type of income	Low incomes	Middle incomes	High incomes	High incomes	High incomes
percentage	11%	38%	31%	12%	8%

In order to measure affordability of housing units based on international standards, consideration 30% from monthly income of household comparing with payment cost amount and after analyzing necessary data related to the current study the affordability condition in (Warvin City)is considered affordable for 26% of residents (high income), It is not affordable for 74%of residents (low, middle income).

2) Affordability Analysis According to Family Size

1- In DabinMasiki

According to the result of questioners, there are four type s of families according to sizes in DabinMasiki as shown in table (4).

TABLE 4. FAMILY SIZE IN DABIN MASIKI

No	Family size	Family type	percentage
1	1 to 2	Small family	25%
2	3 to 5	Middle family	54%
3	6 to 7	Big family	15%
4	More than 8	Very big family	6%

The area of one apartment in DabinMasiki is 106m2, according to [15] and Iraq standards (each person has 21m2) the apartment is suitable and affordable for family size up to 5 person, so according to the questionnaire result the apartment area is suitable and affordable for small and middle family size for (79%) of total families living in DabinMasiki housing project..

2- In Warvin City

According to the result of questioners, there are four types of families according to sizes in Warvin City, as shown in table (5).

TABLE 5. FAMILY SIZE IN WARVIN CITY

No	Family size	Family type	percentage
1	1 to 2	Small family	20%
2	3 to 5	Middle family	34%
3	6 to 7	Big family	28%
4	More than 8	Very big family	18%

The buildup area in warvin City houses is 135 m2 and according to the Iraq standard (each person has 18.5 m2), the houses is suitable and affordable for family size up to 5-7 person, so according to the questionnaire result the housing units is suitable and affordable for (small -middle -big family size) for 82 % of total families living in warvin city.

3) Affordability Analysis According to Location

1- In DabinMasiki

According to the result of questioners the location is found out as second reason to buy an apartment in DabinMasiki, while

the suitable price is the main attractive point which is about 50% from other reasons, 38% of the residents bought apartment due to location of project from city center or because it was near their employment place **Therefore project location considered as second cause for selecting housing units by residents.**

2- In Warvin City

Based on the result of questioners the suitable price is the main reason 55% for Warvin city residents to choose this project, 19% chose because of the location of project, **Therefore project location considered as second cause for selecting housing units by residents.**

4) Affordability Analysis According to House Unit Price

1- In DabinMasiki

Housing unit price include land price and building price as shown below:

A.Land Price

According to the investment law the government provides the land to investor for free, therefore the price of land can be canceled when calculating and checking affordability of housing unit in DabinMasiki housing project

B- Building Cost/m2

The Price of apartment building/m2 in DabinMasiki can be calculated by dividing the cost for selling one apartment to the total area for one apartment. As in the table (6) shows the apartment construction cost.

TABLE 6. APARTMENT CONSTRUCTION COST WITH FACILITIES IN DABIN MASIKI

Item	Apartment construction cost	Infrastructure cost /one Apartment	Operation cost / Apartment	Total cost of Apartment	20% benefit of investor	Cost of Apartment with services
Cost \$	33000\$	500\$	200\$	33700\$	6740\$	40440\$

From that the price of building/m2 according to the construction cost = Cost of apartment with service/ apartment area =(40,440\$/106m2)=381\$/m2.as shown in table (7).

TABLE 7. COMPARING BETWEEN SELLING AND CONSTRUCTION PRICE FOR APARTMENT COST /M2 IN DABIN MASIKI

Methods	Apartment price	Apartment construction price	Apartment area	The price of building /m2 (selling)	The price of building /m2 (construction)
Method one	46000\$	40440\$	106m2	434\$/m2	381\$/m2
Method two	49000\$	40440\$	106m2	462\$/m2	381\$/m2
Method three	51000\$	40440\$	106m2	481\$/m2	381\$/m2

As result if the investor was selling his apartments according to actual construction cost, the project will be more affordable for group 2 (middle income group) 38% for residential in the project as shows in below.

Remaining Payment =Construction Cost- Down Payment =40,440\$-30,000= 10,440\$

Therefore 4.64 years are needed to pay all loans $10,440\$/625\%*0.3*12\text{month}= 4.64$ years less than 6 years. **Finally the affordability of the current project will increase (51+38)=89%.**

2- In Warvin City

Housing unit price include land price and building price as shown below:

A- Land Price

According to the investment law the government provides the land to investor for free, therefore the price of land can be canceled when calculating and checking the affordability of housing unit in Warvin City.

B- Building Cost

The price of house building/m2 in Warvin city showing in table (8).

TABLE 8. HOUSE UNIT CONSTRUCTION COST WITH FACILITIES IN WARVIN CITY

Item	House construction cost	Infrastructure cost /one house	Operation cost /house	Total cost of house unit	%20 Benefit of investor	Cost of house with service
Cost \$	33900\$	3100\$	150\$	37150\$	7430\$	44580\$

From that the price of building/m2 according to the actual construction cost =330\$/m2 as shown in table (9).

TABLE 9. COMPARING BETWEEN SELLING AND CONSTRUCTION BUILDING COST /M2 IN WARVIN CITY .

Method Type	House price (selling)	House price (construction)	House area (m2)	The Price of building/m2 (selling)	The Price of building/m2 (construction)
Phase One	50,000\$	44,580\$	135	370\$/m2	330\$/m2
Phase Two	75,000\$	44,580\$	135	555\$/m2	330\$/m2

As a result if the investor was selling the houses unit according to actual construction cost, the project will be more affordable for group 2 (middle income group) 46% for residents of the project as shown below :

Remaining Payment =Construction Cost- Down Payment =44,580-25,000= 19,580\$

Therefore 8.7 years are needed to pay all loans $19,580/625*0.3*12= 8.7$ years less than 10 year.

Finally the affordability of the current project will increase (26+46)=72%

5) Affordability Analysis According to Infrastructures Services

1- In DabinMasiki

The basic infrastructures that is available in DabinMasiki project is road network, water supply, and power supply. While the local services at neighborhood level are markets, car parks, green area, and waste collection. **The results found that the infrastructures level in the project is over medium and that made the project affordable at infrastructures services level.**

2- In Warvin City

The basic infrastructures that is available in Warvin city is road network, water supply, and power supply. While the local services at neighborhood level are primary school, health center, mosque and green area.

As result, it found out that the infrastructures level in the project is bad case and that led to that the project not affordable for services level.

6) Comparison between Projects (DabinMasiki and Warvin city)

The comparison between the two selected housing projects is done based on the measurement of affordability indicators in both projects as it is shown in the table (10).

TABLE 10. COMPARISON BETWEEN DABIN MASIKI &WARVIN CITY.

No	Description	DabinMasiki	Warvin City
1	Area of land	23 Donim	100 Donim
2	Type of construction	Multi-story (vertical construction)	One story (horizontal construction)
3	Location	Near to city centre (6 km)	Far away from city centre(14km)
4	Number of housing units	1247	649
5	Affordability according to monthly income	51%	26%
6	Affordability according to family size	79%	82%
7	Affordability according to infrastructures	64 %	38 %
8	Affordability according to location	38%	19%
9	Degree of satisfaction of projects	64%	34%

Based on the above facts, the study found that DabinMasiki project is more affordable than Warvin city project.

7) Results &Analyses of In-depth -Interview (Government Housing Policies)

The study find out that, the main **Factor Effecting Affordability** of housing in Duhok city, as a result of in-depth interviewees are: land distribution policy, weak investment law, lack of government subsidies, as cited from 80% of interviews. The rest of interviewees (20%)of interviewees pointed out that, the main factors effecting in affordability of housing are: political, economic factor, population growth, high price of land construction, lack of experts in housing sector in Duhok city. The finding of evaluating the housing policy were as following:

1- Land Distribution Policy

The opinion of (80%) of interviewees confirmed that land distribution policy poor and has not solved housing problem in Duhok city and this policy became market system for high income people. But (20%) of interviewees emphasized that land distribution policy in Duhok city is good and solving housing problem partially, but it faced un-integrated delivering of infrastructures.

2-Investment Housing Policy

According to the opinion of (40%) of interviewees, they confirmed that investment policy that is adopted by KRG is a good policy and has improved the housing sector and the investment projects are suitable solutions to achieve affordable housing units. While (20%) of interviewees confirmed that investment housing project need adjustment and it is not suitable for current development of Duhok city. Finally, (40%)of interviews explained and agreed that the investment housing policy is not good policy, has not solved housing problem in Duhok city, this projects are not affordable specially for low income people and the main benefit from this project are the investors, capital and high income people finally, these projects become marketing processes.

3-Housing Fund policy

90% of the interviewees agreed about the idea that the housing fund policy has limited support for housing sector, specially, in affordability of housing and this policy doesn't include self housing construction, therefore the benefit of this policy is limited and in some special investment projects and because this policy the housing problem remain unsolved. But only 10% of interviewees confirmed that its necessary for KRG to adjust housing fund policy to be more effective, more **4-Real Estate Bank Policy**

As a result of in-depth interview (60%) of experts interviewees demonstrate that; the real estate bank policy is effective and important in housing sector specially in self housing construction for low and middle income people in urban and rural area therefore, the sustainable governmental led to an increase in the number of citizens who benefited from this policy and then get access to housing units. While (40%) of experts interviewees confirmed that; the government subsidies through real estate bank are very limited and not sufficient for construction houses, thus low income people cannot build house with minimum living standards of affordability, therefore it needs to be modified according to current housing needs and percentage of low income group of citizens by increasing installment payment period.

5-Low Income projects Policy

All of the interviewees agreed that the low income policy is very important, effective, and very urgent for housing sector in Duhok city to implement. This policy is subject to delay for implementation due to many factor such as funding, un clear law and regulation. On the other hand, the location of the low income projects is located in area far away from C.B.D which is insufficient place for low income people due to a basic of public transportation.

6-Villages Reconstruction policy

All of the interviewees agreed that the KRG rural development policy was not effective policy and not successful plan, due un-integrated and un-comprehensive plan, for delivering basic infrastructures such as water supply, electric network, education, health service..etc. In the other hand the villages location on the abroad due to instability of political situation did not encourage the citizens to build houses in villages. Other point to be mentioned that the citizens who built

houses in villages, only aimed to use them for recreation and not for settlement.

V. CONCLUSIONS AND RECOMMENDATIONS

1) Conclusions

The study concluded that; inefficiency of housing policies in KRG caused shortage in providing affordable housing units in Duhok City. By applying the price-to-income ratio as international standards 30% of family monthly income, the project is affordable only for 51% of residents in DabinMasiki and this people classified as high income people, so the project is not affordable for low and middle income, while in Warvin City the project is affordable only for 26 % of the residents in Warvin City and this people classified as a high income people, so the project is not affordable for low and middle income people. The DabinMasiki housing project will be more affordable specially for low and middle income when the loan payment decreased from 300\$/month to 125\$/month and that will led to increased loans period from 6 year to 14 year, while in Warvin City is the same when loans payment decreased from 210\$/month to 125\$/month and that to increased the loans period from 10 year to 16.6 year.

Although the government provide land to investors in both projects, but it didn't influence the selling price of housing units. The price of housing units and the loans system is the main reason for citizens to choose housing units in both projects. Affordability of housing units in both two housing project is not affected by location even DabinMasiki nearest to city centre.

2) Recommendations:

Affordability of housing can be achieved by good planning and management of urban land, **Integrated land distribution process, Appropriate implementation of housing investment law, Sufficient governmental subsidies, Integrated village development, Low income program.** To achieve affordability of housing in Duhok city it is important to increase constructing affordable housing units for low income people, elongating installments payments period, using local construction materials and simple design using minimum economic, social and environment standards & building code.

VI. REFERENCE

- [1] Byrne, J. P., & Diamond, M. (2007). Affordable Housing, Land Tenure, and Urban Policy: The Matrix Revealed XXXIV,527-528. Retrieved December 11,2014 from <http://aw2.fordham.edu/publications/.../400flspub8503.pdf>
- [2] Haffner, M., & Boumeester, H. (2010). *The Affordability of Housing in the Netherlands: A Increasing Income Gap between Renting and Owning*, 25 (6), 799–820. Retrieved December 11,2014 from http://repository.tudelft.nl/assets/uuid.../Haffner_2010.pdf
- [3] Lin ,J. (2011). *The Development of Affordable Housing---a Case Study in Guangzhou city, China* (Master Thesis), University of Stockholm, Department of Real Estate and Construction Management.
- [4] Abdullsamad, K. (2011). Innovative PPP-models for affordable housing: potentials and limitations of post war housing trends case study on Kurdistan Region Iraq (Master thesis), University of Technology, Berlin.
- [5] Kurdistan Region, Ministry of Planning, 2014
- [6] Mumtaz, B. (2012) .Strategies to address low-income housing in KRG affordable housing strategies in Kurdistan Region. Erbil: MOCH & UN-Habitat.

- [7] Kutty, N. (2005). A New Measure of Housing Affordability: Estimates and Analytical Results. *Housing Policy Debate*, 16(1), 113-142.
- [8] Chen, J., Hao, Q. J. & Stephens, M. (2010). Assessing Housing Affordability in Post-reform China: A Case Study of Shanghai. *Housing Studies*, 1-25.
- [9] Listokin, D.,&Hattis, B. (2005). *Building Codes and Housing Cityscape: A Journal of Policy Development and Research*, 8(1), 1
- [10] Wendell, C ,& Hugh ,P. (2014). *10th Annual Demographic International Housing Affordability Survey: 2014 Ratings for Metropolitan Markets*. Retrieved November 24,2014 from <http://www.demographia.com/dhi2014.pdf>
- [11] Yao, C. (2011). *Measuring Housing Affordability in Beijing* (Master thesis), University of Stockholm, Department of Real Estate and Construction Management.
- [12] UN-Habitat. (2010). A Practical Guide for Conducting Housing Profiles Supporting evidence-based housing policy and reform, UN-HABITAT. Nairobi :UNON, Publishing Services Section, Nairobi
- [13] DabinMasiki Management, 2014
- [14] Warvin city Management, 2014
- [15] Kurdistan Region, Ministry of Construction &Housing , 2014