

AN ANALYSIS ON THE SUSTAINABILITY OF AN ADAPTED LAND READJUSTMENT COMPARED TO UPGRADING MODEL FOR DEVELOPING THE KABUL OLD CITY

Said Mustafa Habibi¹, Hiroko Ono²

¹Department of Civil Engineering and Architecture, University of the Ryukyus, Okinawa, Japan

²Department of Civil Engineering and Architecture, University of the Ryukyus, Okinawa, Japan

Abstract—Kabul is faced with widespread informal settlements which are characterized by severely inadequate urban services and low quality of life, however the government has taken some steps for developing of informal settlements through upgrading policy but it could not properly solve the issue, therefore we proposed an Adapted Land Readjustment (LR) model to be sustainable and economically friendly. This paper looks into a comparison in terms of the cost and benefit analysis of an adapted LR with upgrading model which was prepared for developing of the same target area to figure out the most sustainable and feasible model for developing of the informal settlements in Kabul. The result after further analysis showed a positive potential for the implementation of adapted LR model, it appeared more economically and environmentally sustainable. The model will enhance quality of life and can provide better and standard urban services for the residents.

Index Terms— Afghanistan, Old city of Kabul, Adapted Land Readjustment, Preservation, Upgrading.

I. INTRODUCTION

Urbanization is a global phenomenon which is acknowledged by many countries throughout the world. As the world continues to urbanize, sustainable development challenges will be increasingly concentrated in cities, particularly in developing countries where the pace of urbanization is fastest [1]. Afghanistan is also a rapidly urbanizing country where the rate of the growth of its population is faster than its planning and economic capacity.

In Afghanistan, cities and towns are expanding to accommodate rising numbers of rural-urban migrants, internally displaced persons (IDPs) and refugee returnees. There has been considerable rural to urban migration over the last ten years, with the relative security in cities, livelihood opportunities, access to services and education being strong “Pull factors”. These pull factors have similarly attracted large numbers of IDPs to move to cities. The rapid migration and vast urban expansion have contributed to large informal settlements in the capital. Kabul, which is the largest city in Afghanistan, faces particular problems with respect to informal settlements, about more than 82% of the city’s population live in informal settlements which occupy 69% of the city’s

residential land [2]. The term “Informal Settlements” often refers to illegal or semi-legal urbanization processes, or unsanctioned subdivisions of land at the urban periphery where land invasion took place – often by squatter who erected housing units usually without formal permission of the land owner and often with materials and building standards not in line with the criteria of the local building code [3]. They may be either planned informality (regular layout but with no building permission) which are not in compliance with master plan or other planning scheme [4].

The residents are suffering from many problems such as poor infrastructure, shortage of public facilities, depriving of the sense of ownership and facing much environmental degradation. Even though majority of the residents are living in such condition, the government response has been quite weak. The government’s main planning strategy has been upgrading in the form of provision of facilities and improving elements of physical infrastructure [5]. The term “upgrading” refers to the measures to improve the quality of housing and provision of housing related infrastructure and services of the settlements that are considered to be slum or developed illegally [6]. Unfortunately the upgrading projects which were implemented in the past for the purpose of slum development could not succeed to achieve the certain objectives. After many literature reviews on slum development practices and models we figured out that land readjustment can be an important tool for reorganizing urban areas [7], the land owners jointly leave land for streets and other public places and build the required infrastructure. Even some literatures pointed out that the use of LR could be particularly effective in Asian countries, where there is a need for clarification of ambiguous and complex land tenure rights. They emphasized that one of the important advantages of LR is that clear title to land is established [8]. By considering the national budget, people’s income and characteristic of the area, we proposed an adapted LR model and applied on a part of the old city of Kabul with a very minimum compensation and contribution ratio. This research focused on comparison of the aforementioned LR model with an upgrading model which was proposed by Ministry of Urban Development and Housing (MUDH) for developing of the

same target area due to figure out the most suitable and feasible development model for the informal settlements in Kabul city. The study essentially focused on pros and cons of each model and has analyzed them from the socio-economy aspects and environmental point of view.

A. Location

The study area is located in district 1 Old city of Kabul, near the Central Business District (CBD) with a land area of 113197.20 m² (Fig. 1). Kabul’s old city is mainly situated in the south of Kabul River and comprises many historic quarters. These quarters are named either after a trade establishment or after the names of a tribe and tribal leaders [8]. The area we have selected is called “*Bagh-Ali-Mardan*”, there are a number of historical houses and a famous bazaar on the site which build a historical character to the area. However the area was heavily impacted by the war, but still famous for its historic and cultural characteristic.

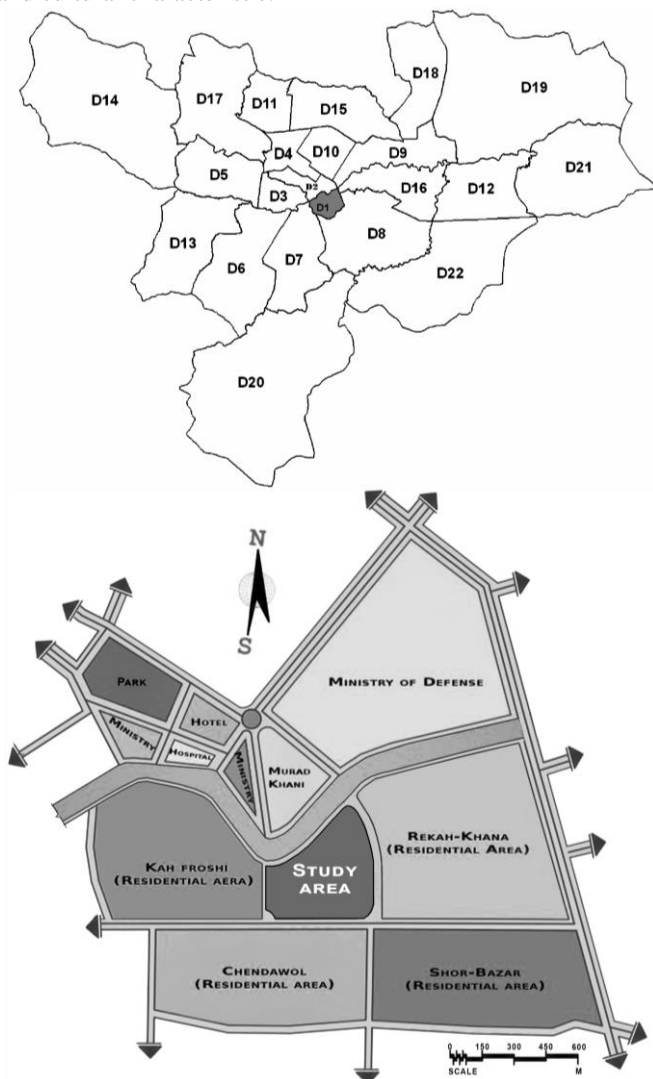


Fig.1. District map of Kabul and location of the study area

B. Existing profile of the area

Currently there exist 117 private residential lots with approximately 819 inhabitants. According to a basic socio-economy survey which conducted on June, 2018 by the author, most of the residents belong to lower-mid income households. There are three types of housing typology based on the construction material like reinforce-cement-concrete (RCC), bricks and mud-bricks; however majority of the houses almost 75% of them are made of mixed-bricks, wooden flat roof with concrete floor. The area belongs to an informal settlement type where most houses are built on privately owned lands. According to the executive decree No.83 article 7, private land means a land which the ownership has proved through valid legal instruments [10], but these residents are not legal owners in a strict sense; they have acquired their ownership for their land through purchase from customary or traditional landowners [11]. About 77.8% of the area covered by the private land and based on the market and land valuation system, lands which are located at the vicinity of the CBD are considering high price lands and it can count as a potential factor for the implementation of LR.

There is a historical bazaar located on the site which was destroyed and burned by British army during the war. The bazaar was one of the fine commercial establishments in the region, it was a famous commercial center; its merchandise has been mentioned by early travellers, thus reflecting the important strategic location of Kabul between East and West [12]. The existence of bazaar and other historical buildings on the site created many restrictions for urban designers and architects in making development plan for the area. Being located close to the CBD, most parts of the area were already transformed into commercial and storages which has affected the function and character of the area. Fig 2 and Table 1 describes about the existing land use and area of the site.

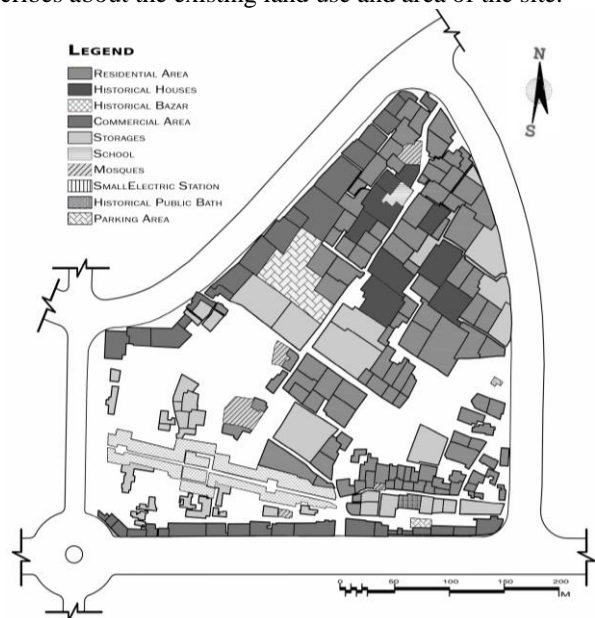


Fig.2. Existing land use of the area

Table 1. Existing Land use specification of the area

Existing land use of the area (Before the project)							
No	Land Use	Area		No	Land Use	Area	
		m ²	%			m ²	%
1	Residential Area	26771.70	23.60	7	Car Parking	2926.83	2.59
2	Historical Houses	6033.10	5.33	8	School	325.89	0.29
3	Historical Bazar	4566.00	4.03	9	Mosques	1402.89	1.24
4	Commercial Area	11509.14	10.17	10	Electric Station	48.57	0.04
5	Storages	14794.30	13.07	11	Roads	18341.95	16.20
6	Historical Public Bath	246.78	0.22	12	Vacant Spaces	26254.91	23.19
		Total Site Area				113197.20	

II. METHODOLOGY

The methodology which has conducted in this research mainly focused on three comprehensive steps. First, analysis of Adaptable Land Readjustment (ALR) model which was prepared for developing of the Kabul old city, the information's and raw data were already inserted in GIS software for the purpose of further analysis and land use digitization of the area. The maps and data related to the proposed land use, financial land, contribution ratio and tables regarding the affected lots and compensation cost were analyzed and sorted. The second step was collecting data regarding the upgrading concept which was proposed by the MUDH on 2011 for development of the same target area; the data's were inserted in GIS and overlapped on the existed land use layer of the area in order to find the number of destructed lots and compensation cost. In the final step, we made comparison of these two analysis through several graphs and statistical data due to find out the most sustainable and applicable model based on the socio-economy and environmental condition of the country.

III. DATA ANALYSIS

This research focused on applicability and sustainability of two concepts which are proposed for developing of the same target area. Both concepts were individually evaluated from the physical, social, economic and environmental aspects due to figure out the most suitable approach for sensitive development of informal settlements in Kabul city.

A. MUDH's Concept

The information's regarding the proposed upgrading concept for developing the Kabul Old City was obtained from Ministry of Urban Development and Housing and then geo-referenced in GIS. The map was overlapped on the existing land use plan of the site in order to find out the percentage of destruction and compensation cost. Fig. 3 and Table 2 shows the proposed concept and land use plan prepared by the MUDH.

Table 2. Land use specification after applying upgrading model

Land Uses after applying Upgrading model							
No	Land Use	Area		No	Land Use	Area	
		m ²	%			m ²	%
1	Residential	52405.43	46.30	7	Historical Public Bath	551.21	0.49
2	Commercial Area (Grade 1)	15110.69	13.35	8	Pilgrimage	200.04	0.18
3	Commercial Area (Grade 2)	4710.07	4.16	9	Road	24386.24	21.54
4	Mosques	1554.61	1.37	10	Open Area belongs to gov	694.10	0.61
5	Green Areas	767.98	0.68	11	Electric Station	632.24	0.56
6	Historical Bazar	12184.53	10.76	12			
		Total Site Area				113197.20	

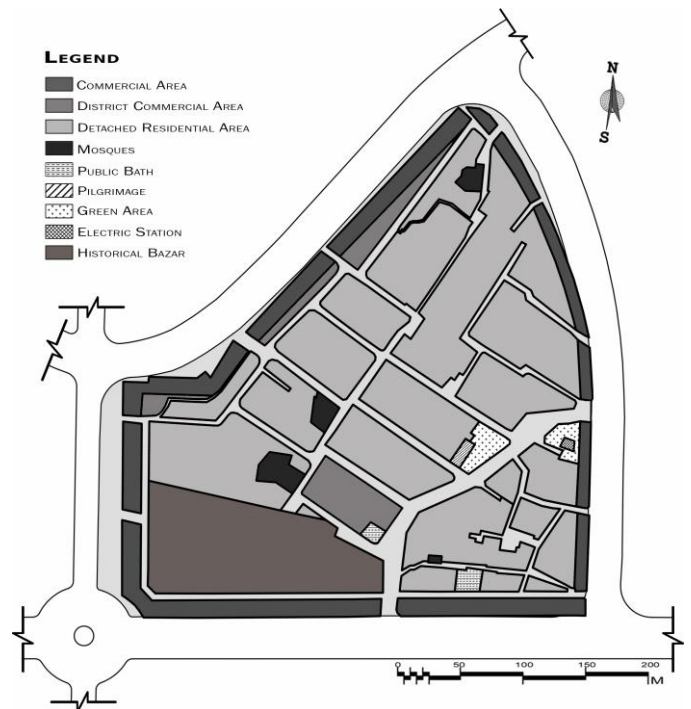


Fig.3. Proposed land use plan by MUDH after applying upgrading

The concept was basically developed based on the physical upgrading model. The main objective was to preserve the existing houses and provide basic urban services and infrastructure for the residents. The most important factors which considered in their plan have mentioned as follow:

- In their plan a part of the area has proposed for the park but the size and location is not based on any principle.
- About 12184.5m² areas which include the Char-Chatta bazaar were completely preserved due to its historical value and background, but there is no any development plan shown in their map in this regard.
- They have specified the boundary of all religious and historical buildings such as mosques, pilgrimage, historical public bath and bazaar in their plan and subsequently preserved them all in the new plan, moreover 4710 m² new land use have proposed for district commercial area.
- A collector road inside the area has proposed which is connecting the bazaar with the commercial & residential area but due to the existence of residential houses around; they could not provide a proper circulation and loop transportation network for the area.

Table 3, 4 and 5 respectively show the destruction and project cost based on upgrading model which proposed by the Ministry of Urban Development and Housing (MUDH). In general, the plan was developed essentially based on preservation of the area but despite of that some lots will be partially or completely destructed due to the widening of roads and some alleys. Fig 4, 5 and Table 6 present the status of the preserved and destructed houses after applying the upgrading model.

Table 3. House destruction and compensation cost

Area			Cost					
Affected Areas by the New Plan			Compensation Cost		Demolishing Cost of the buildings		Demolishing cost for boundary wall	
Boundary Wall (m)	Part of House (m ²)	Complete House (m ²)	Buildings & Houses	Boundary Wall	Building Destruction	Transportation (Soil Removal)	Boundary Wall Destruction	Transportation (Soil Removal)
			150\$/m ²	80\$/m	4\$/m ³	4\$/m ³	4\$/m ³	4\$/m ³
			1852137.93	35880.00	133353.93	133353.93	1883.70	1883.70
448.50	7121.54	5226.05	1888017.93		266707.86			3767.40
			2158493.19					

Table 4. Road destruction and development cost

Area			Cost					
Existing Road			New Road	Cost for the cleaning of the existed road		Cost for development of the new road	Miscellaneous Expenses	Total Cost
Total Existed Road Area (m ²)	Roads to be removed	Poor Asphalt with 2cm thickness (m ³)	Area (m ²)	A		B	C	A+B+C
				Earth Work (4\$/m ²)	Transportation/Soil Removal (4\$/m ²)	Concrete road (71\$/m ²)	(A+B)*0.1	
6133.8	1394.02	2788.04	15028.22	5576.08	11152.16	1067003.62	108373.186	1192105
				16728.24				

Table 5. Total project cost

No	Land Use	Compensation Cost (\$)	Destruction Cost (\$)	Development Cost (\$)	Sub Total (Including Miscellaneous Expenses)
1	Houses	1852137.93	266707.86	0	2118845.79
2	Road	0	16728.24	1067003.62	1192105.046
3	Park	0	0	11519.79	11519.79
Grand Total				3322470.62	



Fig. 4. Preserved and destroyed lots (After Upgrading)

Table 6. Status and areas of the affected lots after upgrading

Land Use	Before Upgrading		Affected Lots (Based on Upgrading model)							
	Area	No	Only Part of the Building Destroyed		Only Yard Destruction		Completely Preserved		Completely Destroyed	
			Area	No	Area	No	Area	No	Area	No
Residential	32912.9	116	3809.2	23	288.3	7	19754.2	77	2319.2	9
Commercial	11407.6	42	2599.6	8	29.9	1	7246.0	27	724.5	6
Public Facilities	1971.3	7	240.0	1.0	0.0	0	1649.7	6	0.0	0
Storages	17581.0	41	472.8	2	0.0	0	8894.7	29	6687.6	10
Total	63872.7	206	7121.5	34	318.2	8	37544.6	139	9731.2	25

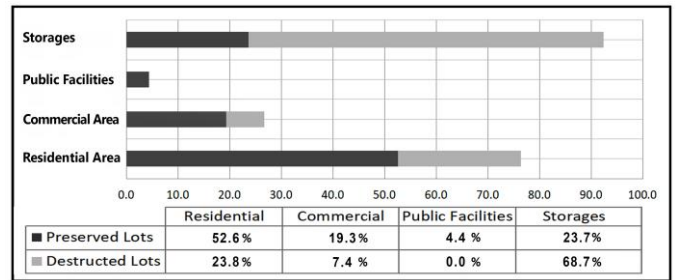


Fig. 5. Area and percentages of the preserved and destroyed lots

B. Adapted Land Readjustment (ALR) model

This model was developed according to the socio-economy and cultural condition of Afghanistan. It mainly focused on preservation of historical and religious sites, using from local construction material, minimization of the contribution ratio and involvement of the private sector. A preliminary concept plan in accordance with the people's need and existing potentials of the area were developed in the light of urban planning principles (Fig 6). In this concept majority of the residential lots have preserved but some dwellings have destroyed and proposed to be moved into the apartments inside the project area. The preserved dwellings are supposed to contribute through money to the project. After site boundaries are readjusted and updated local infrastructure is provided, due to the re-subdivision of parcels, some owners may receive less land than they are entitled to, so the agency will compensate them with cash or resettle them into other place and owners who receive more land will buy the extra areas [13]. Fig. 7, 8 and Table 7 illustrate information regarding the types, number and area of the lots which will be affected in the new plan after proceeding this model.

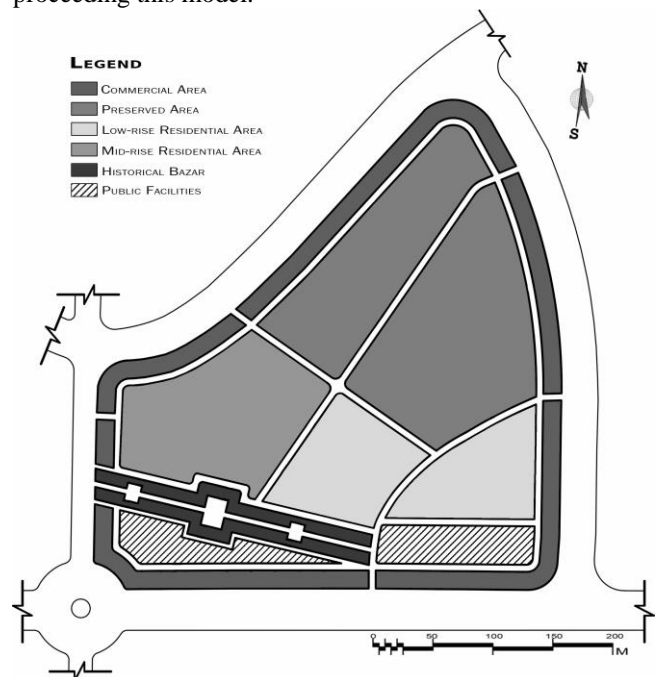


Fig. 6. Land use after adapting Land Readjustment

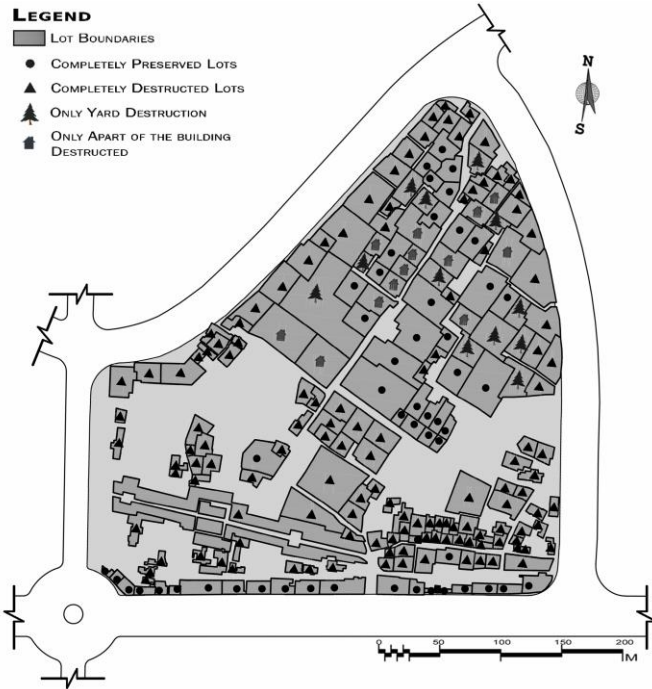


Fig.7. Preserved and destroyed lots after adapting LR

Table 7. Status and areas of the affected lots after (LR)

Land Use	Before LR		Affected Lots							
	Area	No	Only Building Destruction		Only Yard Destruction		Completely Preserved		Completely Destroyed	
			Area	No	Area	No	Area	No	Area	No
Residential	32912.9	116	718.3	11	599.0	11	10157.4	24	13596.3	69
Commercial	11407.6	42	0.0	0	0.0	0	3694.9	21	7712.7	21
Public Facilities	1971.3	7	0.0	0	0.0	0	1669.2	5	302.1	2
Storages	17581.0	41	391.5	2	15.2	1	2692.9	2	9704.8	36
Total	63872.7	206	1109.8	13	614.1	12	18214.4	52	31315.9	128

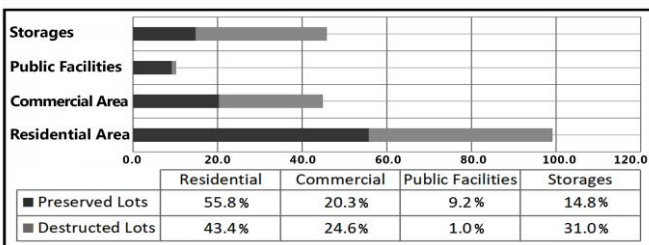


Fig.8. Area and percentages of the preserved and destroyed lots

The important factors which have incorporated in this model are mentioned as follow:

- Minimum destruction and compensation cost have taken into consideration (Table 8).
- Areas with the historical and cultural value have preserved and upgraded. There were five mosques and a number of historical buildings on the site; based on the urban planning principles, three mosques and a pilgrimage preserved in the new plan and the areas which were noteworthy according to their cultural and historical background have proposed to be upgraded and developed based on Afghan-Community Courtyard housing concept. The main idea behind this concept was to share one yard between many dwellers in order to strengthen the social interaction.

- The model was mainly developed to minimize the contribution to an affordable ratio for the residents. However, it covers the development of new roads and total project cost (Table 9, 10 and 11).

Table 8. House destruction and compensation cost

Area			Cost					
Affected Areas by the New Plan			Compensation Cost		Demolishing Cost of the buildings		Demolishing cost for boundary wall	
Boundary Wall	Part of House	Complete House	Buildings & Houses	Boundary Wall	Building Destruction	Transportation (Soil Removal)	Boundary Wall Destruction	Transportation (Soil Removal)
			150\$/m ²	80\$/m	4\$/m ³	4\$/m ³	4\$/m ²	4\$/m ²
328.60	1109.79	35882.42	2454841.89	26288.00	399515.84	399515.84	1380.12	1380.12
			2481129.89			799031.67		2760.24
						3282921.80		

Table 9. Road destruction and development cost

Area		Cost					
Existing Road	New Road	Cost for the cleaning of the existed road		Cost for development of the new road		Miscellaneous Expenses	Total Cost
		A	B	C			
Road Area (m ²)	Poor Asphalt with 2cm thickness (m ³)	Area (m ²)	Earth Work (4\$/m ²)	Transportation / Soil Removal (4\$/m ²)	Stone road (50\$/m ²)	(A+B)*0.1	A+B+C
6133.8	12267.6	25400.20	24535.2	49070.4	1270010	134361.56	1477977
			73605.6				

Table 10. Total project cost

No	Land Use	Compensation Cost (\$)	Destruction Cost (\$)	Development Cost (\$)	Sub Total (Including Miscellaneous Expenses)
1	Houses	2481129.89	801791.91	0	3282921.80
2	Road	0	73605.6	1270010	1477977.16
3	Park	0	0	53967.51	53967.51
Grand Total				4008958.47	

Table 11. Contribution ratio

Land Value Before LR	Land Value After LR	Public Land		Reserve Land		Total Contribution	
\$/m ²	\$/m ²	m ²	%	m ²	%	m ²	%
400	750	13043.1	11.5	5345.3	4.7	18388.4	16.2

The proposed development plan after adapting the LR model has presented in Fig. 9 and Table 12.

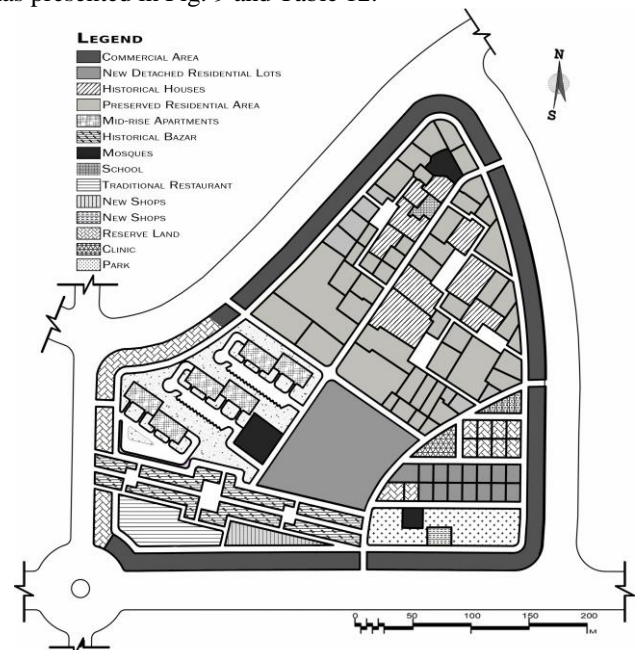


Fig. 9. Land use specification after LR

Table 12. Land use specification after adapting LR

LAND USE AFTER THE LAND READJUSTMENT (LR)			
NO	LAND USE	AREA (M ²)	PERCENTAGE (%)
1	Residential Lots (Re-plotted + Preserved)	24078.8	21.27
2	Historical Houses	6348.2	5.61
3	New Detached Residential Lots	11381.9	10.05
4	Mid-Rise Apartments (Building Coverage Area)	10211.4	9.02
5	Commercial Areas	15505.1	13.70
6	Historical Bazar	4661.96	4.12
7	Historical Public Bath	274.2	0.24
8	Preserved Mosques	1755.5	1.55
9	Preserved School	324.69	0.29
10	Proposed Park	3597.8	3.18
11	Proposed Clinic	599.9	0.53
12	Proposed Traditional Restaurant	2414.23	2.13
13	New Shops	988	0.87
14	Electrical Station and greenery	404	0.36
14	Roads	25400	22.44
15	Reserve Land	5345.3	4.72
	Site Area	113197.20	100.00

IV. Discussion

At the context of Afghanistan where most lands have been developed informally there is a series need for an orderly land reformation process [14]. The process should have the flexibility to solve both current and future problems of informal settlements. In this research two development concepts which were prepared for developing of the Kabul Old City have been studied and after analysis the result showed that Adapted LR yields more benefits than the physical upgrading method. The Adapted LR model is a self-financed model and allow for participatory planning. When considering many other factors of urban planning such as better accessibility to basic infrastructure, provision of public facilities, lower compensation payment and relocation of the affected dwellers inside the project area, it is evident that the proposed Adapted LR will be more efficient and sustainable.

However the upgrading model compared to Adapted LR model looks cheaper (Refer to table 5 & 10) and easy to implement since it has preserved majority of the lots and as the model substantially focused only on paving the roads and providing drainage and a small park which made the destruction also less. From the urban planning point of view, the model considers not too sustainable as next to the economy factor, there are some other indicators too such as quality of life and environmental issues which should be highly considered while planning. Sustainability is not only about economy but often seen as a three-dimensional concept that covers social, ecological and economic perspective [15].

Fig.10 presents the project cost based on both development methods which include the cost for destruction, development and compensation. According to the chart the total project cost based on Adapted LR model is 686,488\$ more expensive than

the upgrading. The less destructions of upgrading model have significantly impacted the compensation cost which finally minimized the total project cost.

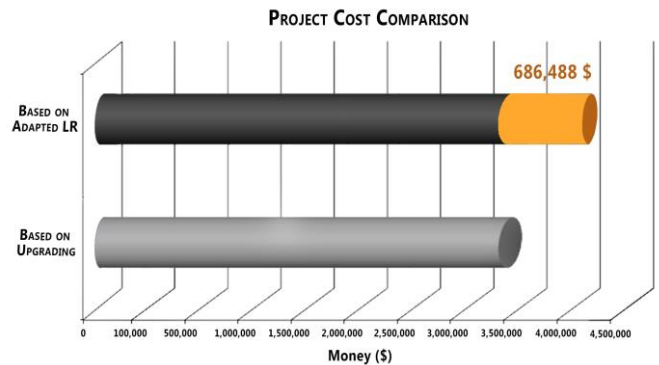


Fig.10. The total project cost at initial stage based on both methods

The sustainability of the ALR model is that after completion of the project the total project cost including compensation cost will be cover by the financial land of the project as it is a self-financed model. Furthermore, as Adapted LR has the potential to involve PPP models in the project so it can certainly bring profit for the private sector and as well as government. The Upgrading scheme is not a self-financed model therefore the project cost should be cover by the government or another resources (Fig. 11).

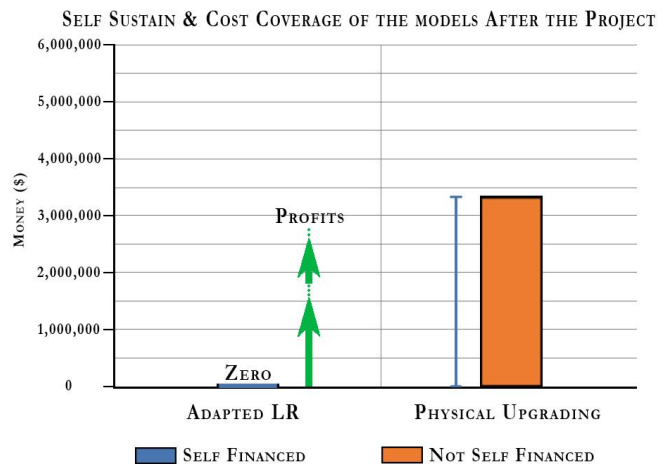


Fig. 11. Project cost coverage after the project

Moreover, the two bar chart in Fig. 12 and 13 illustrates and give information about the number of preserved and destructed lots for individual land uses based on each development model. The upgrading model has preserved majority of lots, by the other hand only 25 lots have destructed while according to Adapted LR model this number reaches to 128 lots. However, Adapted LR model made less partially destructions compared to the upgrading model, according to the figures about 25 lots shown partially destructed while based on upgrading it has increased to 42 lots.

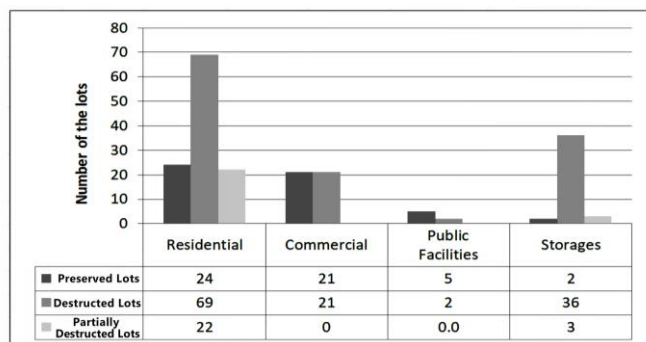


Fig.12. Preserved and destroyed lots based on Adapted LR model

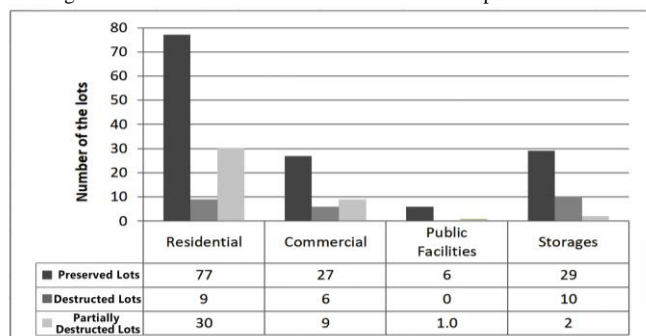


Fig.13. Preserved and destroyed lots based on Upgrading model

Sustainable development aims to maintain economic advancement and progress while protecting the long-term value of the environment, based on this statement, Adaptable LR model is more environmentally and socio-economy friendly concept, it can surely enhance quality of life for the residents, in short term can bring profit for the private sector and in long run will benefit the government and householders.

V. CONCLUSION

Afghanistan is undergoing the most powerful wave of urbanization in its history. Kabul the capital more than any other city in the country has experienced enormous pressure of urbanization as millions of Afghans migrated to the city, which finally caused slum and expansion of informal settlements. Today the informal settlements represent about more than 69% of Kabul with a very limited access to infrastructure, land tenure and basic public facilities. A part of the old city of Kabul which is an informal settlement area has selected as study area, two different models have been proposed for developing of the aforementioned area; this research relied on a comparison in terms of cost and benefit analysis of both models. The findings after analysis show a positive potential for the implementation of Adapted LR, it appeared more efficient and socio-economically friendly. Urban planning is not about making colored land use maps but is a way to make a difference and create a vibrant economy; the upgrading model which was proposed by Ministry of Urban Development and Housing is basically concentrated on preservation and paving the roads and providing drainage system; it cannot enhance quality of life, furthermore it is not economically friendly too as the compensation cost for the affected land owners should be paid by the government and the green area which proposed

in the new plan also has the problem of functionality. The adapted LR model looks more sustainable as it is a self-financing project and includes efficient people's participation. The model aims not only to improve housing, infrastructure and access to services but also creates a partnership between government, private sector and people which will certainly establish a platform for attracting local investments and as well as strengthen the ability of community to partake in the project. Moreover, it will increase the land value and establish land tenure rights to enable a stable economic development. According to this model majority of the residential lots including historical buildings and bazaar which was noteworthy according to their cultural and historical value have been preserved and about 13911.9 m² has taken into consideration to be developed by the mid-rise apartments in order to accommodate the householders who have affected by the project and as well as have the capacity to accommodate 50 more families. This model has the potential of private sector's involvement in developing of public facilities through several public-private-partnership (PPP) models. Moreover, local and existed construction material such as cobble stone has suggested to be used for development of the new infrastructures like road and footpaths in order to generate job opportunities in different levels for the community.

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