

DEVELOPING SUSTAINABILITY ASSESSMENT OF INFORMAL DEVELOPMENT ON ILLEGAL LAND SUBDIVISION BASED ON THE BEQUEST FRAMEWORK

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Abstract: Illegal land subdivision in developing countries as well as in the Eastern and Southern Europe has been a major feature of urbanisation. This type of development accommodates significant number of population who cannot meet their housing needs in the formal market. The residents of these areas buy the subdivided land and construct their houses, but outside the legal system. Government efforts to combat this phenomenon have two directions, one is to prevent the emergence of new subdivisions and the other is to deal with the existing settlements. The former has never changed up to date. The latter changed from ignorance to demolition to servicing the settlements and then to regularising the existing settlements since 1980s. The strategies and programmes for both the directions have not been implemented properly. There is an urgent need to understand and evaluate the existing situation and assess it in the content of sustainability. The BEQUEST framework which was developed early in this century is probably the only framework to help assessing the sustainability of formal urban development. There is no such framework to assess illegal development. This paper aims at developing a framework that can be used in the cases of illegal development. The analysis shows that the proposed framework differs from the BEQUEST one in the development activities. No changes are suggested to the set of sustainability issues and the time scale found in the BEQUEST framework while constructing the new framework.

Keywords: Illegal land subdivision; Regularisation, Sustainability issues; The BEQUEST framework.

INTRODUCTION

Illegal land subdivision has been a major feature of urbanisation in the developing countries as well as in the Eastern and Southern Europe. Early illegal subdivisions took place within the city boundaries before the subdivision gradually moved towards the peripheries and nearby rural areas, where it brought about critical social, economic and environmental changes to the local communities. This type of development accommodates significant number of population who cannot meet their housing needs in the formal market. Between 20% and 60% of the population of the major cities of the developing world lived in areas developed through illegal land subdivision in the first decade of the current century (UN HABITAT, 2009). The residents of these areas buy the subdivided land and construct their houses, but outside the legal system.

Government efforts to combat this phenomenon have two directions, one is to prevent the emergence of new subdivisions and the other is to deal with the existing settlements. The former has never changed up to date. The latter changed from ignorance to demolition to servicing the settlements and then to regularising the existing areas since 1980s (A. Mahmoud, 1999). There is a wide agreement amongst vast majority of concerned authors around the world such as A. Mahmoud (1999), A. Mahmoud (2002), UN HABITAT (2009), Goulden (2011) and Charlotte & Stéphanie (2013) that the strategies and programmes for both the directions have not been implemented properly. Regularisation has not resulted in tackling the major development issues of the settlements putting them in the midway between legal and illegal status. New illegal land subdivision

is still coming up till today producing settlements with severe issues. This situation constitutes a critical obstacle to the efforts of the city authority towards more sustainable urban development. According to the Executive Director, UN-Habitat, cited in (Wekasa *et al*, 2011), the number of the residents of informal settlements is likely to triple by the year 2050 if proper and urgent measures are not taken. Proper measures to overcome the illegal land subdivision obstacles towards more sustainable urban development require better understanding of the existing situation and assessing it in the content of sustainability.

The BEQUEST framework which was developed early in this century is probably the only framework to help assessing the sustainability of formal urban development. It defines each of the development activities and their relevant sustainability issues. The framework then relates each of the issues to its time and spatial scales. It provides a frame of reference that helps decision makers in understanding the context they work in and how urban interventions we make today will support more sustainable urban development (Curwell *et al*, 2005). There is no such framework to assess the development through illegal land subdivision. This paper attempts through desk work, to develop, based on the BEQUEST framework, a framework that can be used to assess the sustainability of illegal development.

THE BEQUEST FRAMEWORK

It is the major component of the tool kit of the BEQUEST (Building Environmental Quality Evaluation for sustainability Through Time), which is an international network of experts, set up in the mid of 1990s by the European Union to explore sustainable urban development realization. The tool-kit contains a vision, framework, directory of assessment methods and set of protocols. The framework relates urban development activities and sustainability issues (environmental, economic, social and institutional) to their spatial levels and time scales (Fig. 1). Due to its potentiality of surfacing sustainability issues and identifying gaps in sustainability understanding between stakeholders, the framework was used by other research groups and projects such as the European Green Building Forum and in Construction and city Related Sustainability Indicators project (CRISP) (Curwell *et al*, 2005).

“The BEQUEST framework is intended to establish a clear organizational bases for the urban development activities, issues, levels and scales of analysis which should be taken into account when setting out the protocols to be followed in assessing the sustainability of urban development” (Brandon Peter, 2005, P. 5). As figure 1 shows, the framework consists of four components: urban development

activities, sustainability issues, spatial levels of the issues and their time scales. There are five main activities. Each main activity has its own sub-activities. The main activities and the sub-activities are: “Planning (strategic and local), Property development (public and private interests), Design (urban, building and components), Construction (new building, refurbishment and demolition) and Operation (use, facilities management and maintenance)” (Curwell S. *et al*, 2005, P. 23). The sustainability issues component contains environmental, economic, social and institutional. Environmental issues encompass depletion of natural resources, pollution, changes in land uses and loss in biodiversity. Loss of production, decaying in the building stock, inadequate finance and transport and utilities are the economic issues. Social issues include Lack of access to facilities, inadequate safety and security, poor health and poor sense of community. Governance, justice and ethical systems are the institutional issues components (Curwell S. *et al*, 2005).

According to the BEQUEST framework, urban development activities can take place at various levels from the single building development and its components up to the neighbourhood level and higher up to the city as a whole. The consequent implications of urban development can be felt at various levels from the locality level to reach in some case, the global level. The spatial levels adopted by the framework are: components materials, building, estate, neighbourhood, district, city, urban region, national and global. The time scale suggested by the BEQUEST framework for analysing sustainable urban development covers short term, medium term and long terms. The time span adopted for the three terms are 0-5 years, 5-20 years and more than twenty years respectively (Deakin *et al*, 2004).

In order to examine the possibility of applying the BEQUEST framework to assess the sustainability of the illegal land subdivision, there is need to define the activities of the illegal subdivision and its consequent sustainability issues and investigate the possible time scale and spatial dimension of the issues.

ILLEGAL LAND SUBDIVISION ACTIVITIES

Analysing the work of authors from various parts of the world and from various periods of time such as Aise (1987), Nayani (1987), Payne (1989), Anthony (1990), Erbach (1990) Pronchokchai and Thandanit, (1990), Silas (1990), Hassan (1992), Alain and Valérie (1996), Mahmoud (1999), Aise (2006), Subadyo (2007), Pervasi *et al*, (2008), Andrew (2010), Goulden (2011), Abasa (2012), from Asia; Amis (1984), NairobiOstreich (1987), Haren (2011), Kamma (2011), Mitchel and Leonard (2011), Scelo (2011) from Africa; and from Latin America,

Blaesser (1981) Gilbert and ward (1985), Baross (1986), Doeble (1987), Noorduyn and Echeveria (1987), Calderon and Julio (2006), Alexandre (2009), Erminia (No date), shows that the illegal land subdivision process in the countries of the developing world takes place at similar stages and has got very similar general features. The development activities of illegal land subdivision can be grouped into four stages: preliminary planning, land subdivision, construction and occupation, planning (services provision and legalisation). They are discussed below in figure 1.

Preliminary Planning

Illegal land subdivision starts when land owners or sub-dividers put agricultural land, mainly located at the outskirts of the city, illegally for sale for housing development, without following planning regulations and standards. The subdivision schemes do not have pre-prepared plans and no land is allocated for public facilities such as schools, health care and open spaces. Targeted lands are mainly agricultural. The sites are in some cases, vulnerable to natural hazards such as water logged areas and slopes of hillocks. In other cases they are aimed for urban development. Wide range of income people, migrants and even from the formal areas of the cities, are involved in buying the illegally subdivided plots.

Land Subdivision

The process of land subdivision is simple and quick. The allocation of the plot to the buyer is done on the site. The size of the plot is defined by the buyer and governed by his affordability. No official permission is sought for the land subdivision and sale. Wide range of plot area from too small plots to large ones is reported from various places in Asian cities and other developing countries. Property right is in general conveyed to the buyer through illegal sale contract which provides land rights the same way the formal contract does. The contract however is not, recognized by financial institutions as an official document. Public utilities such as sewerage system, electricity, and water are generally not provided prior to the illegal subdivision and sale of land. There are however, some cases where the developer provides some services at the initial stage of the subdivision scheme.

Construction and occupation

After buying the plot in illegal land subdivision scheme, the buyer usually builds a part of the house, in general one room and toilet, and occupies it. More parts such as a kitchen and more rooms are added whenever the financial conditions help. No official permission is sought to start constructing the house or improving it. The design of the house is generally carried out by the residents who do not follow

building by-laws. Consequently, design mistakes such as inappropriate location of bathroom, toilet and kitchen and rooms without ventilation are usually made. Hired labourers usually carry out the construction works. However, family members may contribute. Building materials are generally permanent. The house completion usually takes long time. This incremental type of development distributes the cost of the house over many years. It also enables the settlers to meet their urgent need for a shelter in a relatively short period of time. In the recent two decades however, making ready-to-use apartments for sale by private developers is a widely found phenomenon.

The major threat during the illegal construction works of the house is the official reaction which usually takes the form of demolition. The threat however, is considerably less after occupying the constructed part of the house. This can be attributed to the presence of laws in several places of the world where the eviction cannot be carried out by the authorities unless they secure another shelter for the evicted family. Carrying out the construction activities on weekends and public holidays is a main measure taken by people to avoid the threat of demolition. Constructing quickly the part of the house required for occupation, results in technical structural issues. Another measure to avoid demolition is to pay bribe to local police and officials. After occupying the shelter, improving the house, seeking services to the house and the settlement and obtaining official recognition become the main concern of the residents.

The absence of public services such as electricity, water and sewerage prior to and during the house construction, makes the dwellers of the settlements taking their own initiatives to have some or all the services in their areas. In some cases people illegally connect to the public networks of electricity and water. In other cases, people open wells, pave roads and open channels to carry houses' discharge and rain water away from the settlement. The lack of know-how affects the quality of such initiatives.

Planning

The first official attitude towards the settlements that were developed through illegal land subdivision was not friendly. Demolishing the illegal structures was the main tool to combat the illegal subdivision. Later, the official attitude was geared towards accepting the existing settlements. The acceptance however, was accompanied with the official policy of combating new developments and preventing the extension of the existing ones. The acceptance resulted in partial service instalments. It developed later to reach the level of legalisation.

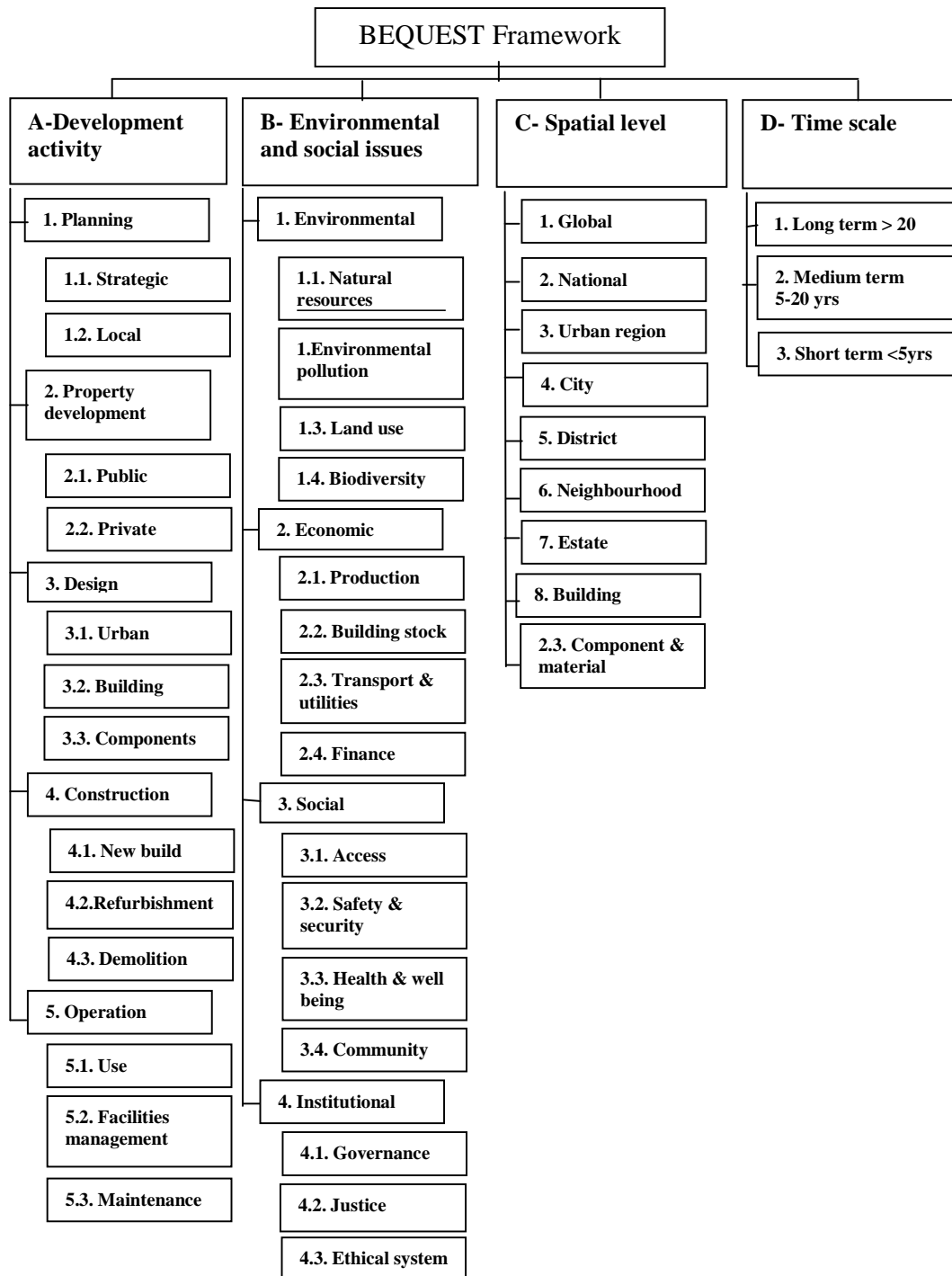


Figure 1: The BEQUEST Framework
 Source: (Curwell S., Deakin M. and Lombardo P., 2005) p.34

The legalisation policy did not eliminate the earlier policy of opposing illegal land subdivision and consequent housing development. It is usually preceded by preparing a regularization plan for each of the targeted settlement. Legalization of the settlements developed through illegal land subdivision consists mainly of: (a) "Incorporating the legalised colonies into their respective cities; (b) Providing services and public facilities; (c) Legalization of occupancy rights; (d) Cost recovery from the beneficiaries" (A. Mahmoud, frothing, p. 7).

The vast majority of the literature on illegal land subdivision show that complete legalisation of the settlements developed through illegal land subdivision in developing countries has been rare. Legalisation did not exceed the provision of services, some facilities and some physical improvement. The regularization plan could not catch up with the actual changes in the settlements. Scarcity or non-availability of land for public facilities such as schools, open spaces and health care facilities is one of the critical issues faces the regularisation. Further, physical integration of the settlements to the mother city is given the highest priority. Social and economic integration is not given the appropriate attention which makes the integration process incomplete even when the policy is fully implemented. Even with partial implementation, legalisation usually leads to a significant increase in houses and land prices.

SUSTAINABILITY ISSUES: TIME SCALE AND SPATIAL DIMENSIONS

This part will investigate the possible environmental, economic, social and institutional issues of illegal land subdivision and explore the possible time scale and spatial dimensions of each type.

Environmental Issues

Illegal land subdivision has various types of environmental issues. Subdividing agricultural land reduces the amount of land which is used for food production around the cities. This is a loss of natural resources. This issue is a long term one as the loss of the agricultural land cannot be compensated. The entire city will be affected.

Illegal land subdivision produces environmental pollution. Septic tanks and open channels for sewage disposal pollute underground as well as surface soil. The open channels reach, in some cases, the city peripheries. The time scale of this impact can be short, medium and long. The short term happens when the residents of the settlements are in a direct contact with the discharging channels. The pollution in underground water and soil takes place in the medium and long term by the discharging channels and septic tanks.

Land use is changed by illegal land subdivision at the city level and its region. At the former, land allocated for future urban development is illegally subdivided while subdividing the agricultural land at the city periphery changes the land use at the later. The subdivided land, particularly that land which is allocated for future development of the city, is usually defined by long term master planning.

Economic Issues

Consuming agricultural land in illegal land subdivision has two consequences related to economic issue of production. Firstly, the size of productive land shrinks. This withholds the city economy from economic benefits of the lost production. Secondly, those people who were engaged in producing, transporting and marketing the products lose or change their employment. Spatial impact of these consequences goes beyond the city to its region as the agricultural land is mainly located in the peripheries. These issues become more obvious in the long term with the increase in the subdivided areas.

As the by-laws and other regulations are not followed, significant amount of sub-standard houses is produced. This along with the absence of public open spaces in the illegal subdivision schemes produce distorted urban form. This means that the spatial scale is local and up to the city level. It is expected that this impact on the city will continue as long as the illegal land subdivision continues which is expected for many years to come according to UNSCAPE (2009).

When the space is not adequately provided for public facilities such as health care and schools in the illegal subdivision schemes, the provision of the facilities at the planning stage will be difficult. As a result, the residents will seek the facilities in the neighbouring formal areas increasing the pressure on them and affecting the efficiency of the services they provide. This means that the spatial impact of this issue is up to the city level. It will continue to appear as long as the existing practices remain.

The residents of illegal settlements illegally connect their houses to some of the networks of the services such as electricity and water. This reduces the efficiency of the networks making even the residents of the formal areas suffer. Illegal subdivision is in many cases widespread. As a result the impact of this issue reaches the city level.

There are several issues related to finance. Their time scale goes up to the long term and their spatial impact is up to the city level. To give an example, Illegal land and housing transactions before and after regularization withholds the city economy from significant economic benefits. The city financial

system loses a source of revenue that could be made available if the transactions were carried out through the legal system.

Social Issues

As mentioned earlier, the contracts in illegal land subdivision are not recognised by financial and other institutions in the city. This withholds the contract holders from having an access to those institutions for obtaining loans and other possible services. The city institutions such as banks and insurance companies also are withheld from potential clients. It seems that the situation will continue till the land right is transferred legally to the buyers. If happens, this takes a very long time. It's obvious that the spatial level of this issue reaches the city level.

The quick construction of the houses at the weekends and on public holiday outputs structures that are not strong enough. This constitutes a threat to the people's lives in medium and long term. Its impact is local.

The increase in land and houses prices as a result of legalization tempts low income residents to sell their houses to higher income buyers. This may increase illegal activities as the sellers probably move again to another illegal land subdivision (A. Mahmoud, 1999). The impact of this issue is expected to continue as long as the illegal subdivision takes place. The move of those who sell their property from one place to another in the city makes the spatial scale of this issue extends from the local level to the city level.

Wekesa *et al* (2011) found that the environmental conditions of illegal settlements in the developing countries are generally hazardous. The Poor quality of the built environment of the settlements developed through illegal land subdivision constitutes significant threat to the people health. Unless serious measures are taken to improve the situation, the threat will continue for long. The spatial impact of the poor environmental conditions of the built environment is mainly concentrated in the neighbourhood.

The residents of illegal land subdivision come from various places in the country. They may find, particularly at the initial stage, some difficulties in coming together and cooperate to improving their places. The spatial impact here is local and limited to the neighbourhood. The time scale seems short and medium. Discussion in 3 shows that the residents of the settlements developed through illegal land subdivision, make their own initiatives to make some services available in their neighbourhood. This usually takes place after a locality is resided with significant number of people.

Institutional Issues

Illegal land subdivision and the following stages of development make people familiar with breaking the law. Violating the law and the regulations in the development process of illegal land subdivision passes from one generation to another and affects the commitment of the society's members towards laws and regulations. In addition, "The special arrangements" with local police and some concerned officials for overlooking illegal house construction and avoid demolition, contribute significantly to the corruption in the governmental institutions. These issues can be considered as a part of the ethical system issues. As the arrangements are usually made with the directly involved persons from the government, their impact is spatially local and its time scale is probably limited. The consequences however, are long as they pave the road for more illegal structures in the city.

The process of illegal land subdivision and its continuity up to date raises the question of social justice in the city where there are people who cannot afford formal housing and services and need to suffer the whole process of illegality. The time scale of this issue is long. The residents of the settlements developed through illegal land subdivisions and the city suffers for a long time.

The main issue in the process of illegal land subdivision comes after the regularisation and relates to governing the settlements and convert them from total illegality to total legality. Legalising land title, providing public services and facilities and empowering local communities are some aspects of the issue. As the regularisation usually does not reach full pace, the time scale is long. Various city authorities are usually involved in the regularisation process such as planning, water supply, electricity and land departments. This make the spatial impact extends from the neighbourhood level to the city level. Table (1) summarizes the main activities of the illegal land subdivision and their time and spatial scale.

DISCUSSION AND CONCLUSION

In order to define the adjustment and its extent that are required to be made to the BEQUEST framework to make it suitable for assessing the sustainability of illegal land subdivision, a comparison between the formal development and the illegal land subdivision, needs to be carried out on the four components of the framework. This is the subject of the following section.

Development activities

As table 1 and the analysis in 3 show that there are significant differences between formal urban

development and illegal land subdivision in the components of the development activities and in their progress.

Components

Planning for development at various stages is the first step in the formal urban development. The main outcome of the planning stage is a land use map. This stage usually involves a wide range of data and information that cover various aspects such as topography, population, economy. Wide range of actors, mostly technical, participates in it. In the illegal land subdivision, the development starts with local level preliminary planning which takes place on the site of the subdivision. Limited number of actors is involved. No land use map is produced. The activities are limited and they depend on the experience of the subdivision and his personal knowledge. As a result, in the proposed framework based on the BEQUEST framework, preliminary planning activity with local level is suggested to be the first level. This is replacement of the planning activity with strategic and local levels in the BEQUEST framework.

Then, the property development is taken either by the public, by the private sector or jointly by the two sectors. At this stage the plots definition on the site usually takes place. Infrastructure and utilities are provided. In the illegal subdivision, the owner or the sub-divider who is neither from the government nor from the formal private sectors are involved. The subdivision takes place on the site. However, no infrastructure is provided and no utilities are installed. It is therefore; appropriate to suggest that land subdivision activity is the second activity in the proposed framework.

The design activity in formal urban development in general covers urban, building and the details of the building. The urban design level deals with the organization of more than a building, up to the city level. The building design organizes the interior spaces and gives details of the building components. In the illegal land subdivision this stage does not exist. The locality is organized based on the definition of the roads at the early stage of the subdivision. The house usually is built up according to the vision of the plot owner. Thus, it can be suggested that design (urban, building and component) is excluded in the adjusted framework.

Construction works start after the design work is certified and the building license and other official requirements are met in the formal urban

development. Based on the type of the project, the construction work may cover one or more of new construction, refurbishment or demolition. In the illegal land subdivision, construction takes place in an incremental manner and usually takes long time. A part of the house is constructed and occupied. After occupying the house some utilities are provided to it mainly by the house owner. As a result, it can be suggested that the construction activity in the BEQUEST framework can be replaced with construction and occupation. The subcomponents can be maintenance, utilities provision and incremental house development.

After the construction activities are completed, the users in the formal development occupy the structure and use it. Further activities after the occupation take the form of facilities management and maintenance of the building. In the illegal land subdivision, the occupation takes place at an early stage when a part of the house is constructed. The activities after the occupation are the extension of the house, obtaining services and improving the quality of the house. These have been already covered in the earlier suggested type of activity. Therefore, operation activity in the BEQUEST framework can be eliminated in the amended one.

The stage which appears in the illegal land subdivision development and cannot be seen in the formal development is the regularization which can be considered as the planning stage of the illegal subdivision. Here the planning activities practically started. The activities take place at two levels, the city level and the neighbourhood level. The city level covers the strategies to regularize the illegal settlements. The neighbourhood level (locality) contains activities related to legalization of property ownership, house extension. As the utilities and facilities are provided at this stage, facilities provision and management are contained init. Governing the legalized settlement and integrate it into the legal system of the city can also be included at this stage.

The regularization main activities are property ownership legalization, physical integration of the settlements with the city and utilities and facilities provision. One of the major shortcomings in the present regularization practices, as discussed in 3, is that the socio-cultural and economic integration of the residents is not taken into account. It is suggested that these activities need to be considered in the regularization programmes and may be listed under regularisation.

Table 1: The Main Sustainability Issues of Illegal Land Subdivision, Their Time Scale and Spatial Dimensions

Sustainability issue		Availability in the process	Subdivision stage				Time scale	Spatial dimension
			++	1	2	3		
Environmental	Natural resources	✓	*				- Long	- City
	Pollution	✓		*	*		Short, medium and long	- Local - City region
	Land use	✓	*				- Long	- City region - City
Economic	Production	✓	*				- Long - Long	- City region - City region
	Building stock	✓		*	*	*	- Long	- Neighbourhood and City
	Utilities	✓		*	*	*	- Short, medium and long	- City
	Finance	✓		*	*	*	- Long	- City
Social	Access	✓		*	*	*	- Long - Short, medium	- Locality, city - Locality, city
	Safety and security	✓		*	*	*	- Medium and long	- Locality, city
	Health and well being	✓		*	*	*	- Short, medium and long	- Locality
	Community	✓	*	*			- Short and medium	- Neighbourhood
Institutional	Ethical system	✓	*	*	*	*	- Short, medium and long	- Locality, City
	Justice	✓	*	*	*	*	- Long	- City
	Governance	✓				*	- Long	- Neighbourhood, city

++: 1- Preliminary planning, 2- Land subdivision, 3- Construction and occupation, 4-Planning (servicing and legalisation) Source: author, Kuala Lumpur, 2013

Progress

In the illegal land subdivision, various activities can be found at each stage of the development. As the analysis in 3 shows, after the initiation of the land subdivision, one can find land subdivision activities; house construction and services installation take place concurrently in the illegal land subdivision scheme. Illegal land subdivision continues till an advanced stage of the development. It mostly ends before regularization starts. Regularisation usually targets those fully developed settlements. Therefore, it can be suggested that in addition to appear as a main activity, land subdivision can appear as a sub-activity in the next stages before the regularisation. House construction and improvement occurs in an incremental manner. It continues even during and after the regularization. It can therefore, be suggested

that construction appear also under the planning activities (servicing and regularisation). Most of the planning stage sub-activities are carried out by the government. Private sector has however, become strongly involved in urban development. There could be cases where the private sector are involved in the regularization activities, thus private sector can be included under the planning activity as well. House construction is carried out by the residents; it then can be classified under private sector sub-activities. Facilities provision starts at the stage of construction and occupation. It is mainly done at this stage by the residents. The services and facilities are provided under the regularisation programmes. At this stage, they are provided by mainly the government sector. Therefore, it can be suggested that facilities appears at the construction and occupation as well as under the activity of planning (servicing and regularisation)

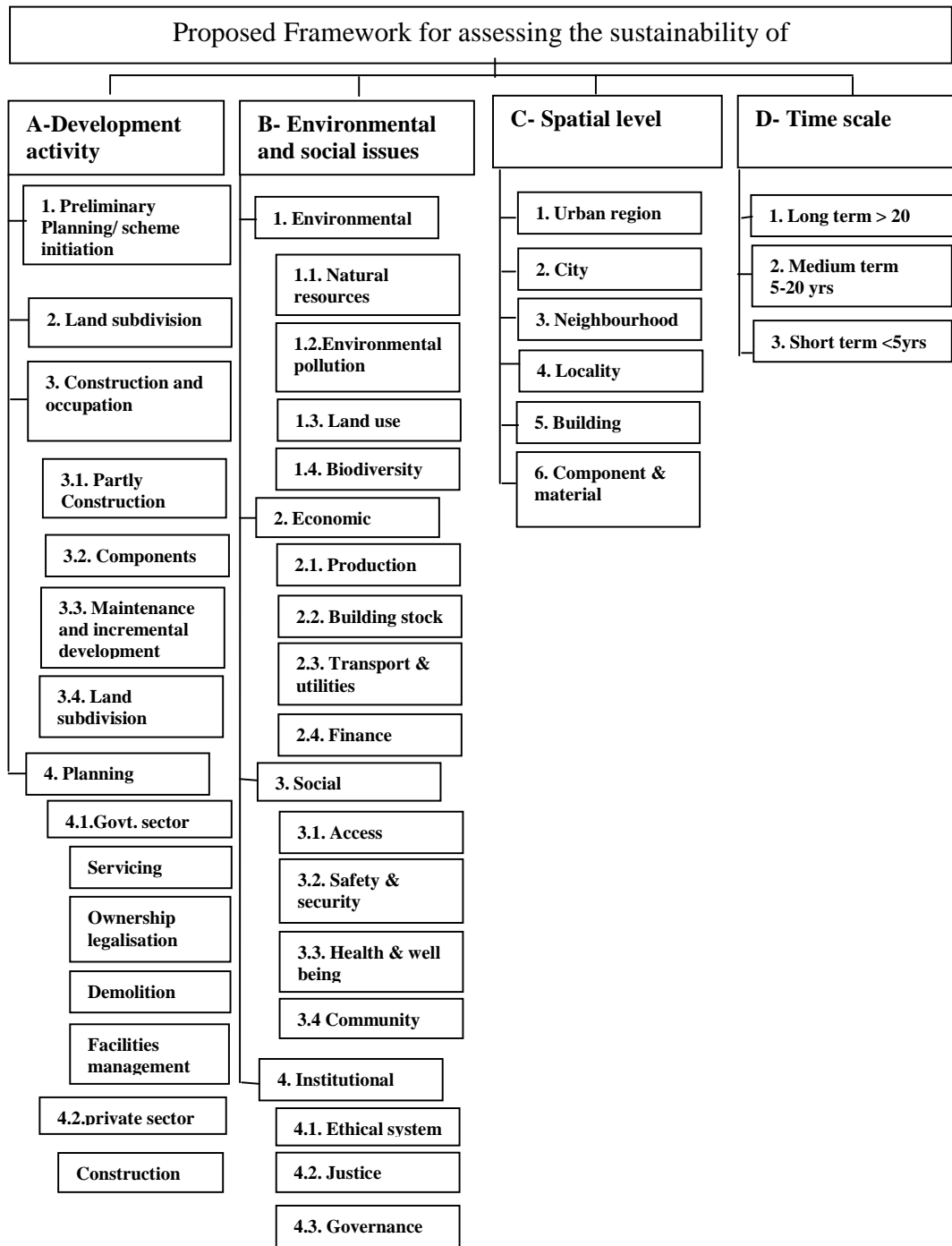


Figure 2. The Proposed Framework for Assessing the Sustainability of Illegal Land Subdivision

Sustainability issues

The illegal land subdivision consumes agriculture land which is a non-renewable natural resource. It also changes the land use, pollutes the environment and also has negative impacts on the biodiversity. It can be therefore, suggested that the same set of environmental issue set up in the BEQUEST framework can be adopted for the proposed framework for illegal land subdivision.

The set components of economic issues found in the BEQUEST framework are found as a result of illegal land subdivision activities. The subdivision reduces food production when it consumes agricultural land. It produces substandard houses which can be considered under the category of building stock. The pressure it puts on utilities networks of the city and transport system comes under transport and utilities. Its negative impact on financial institution and the financial resources of the city can be considered as financial sustainability issues.

The set of components of the social issues in the BEQUEST framework can be adopted into the proposed framework for illegal land subdivision. They all appear as a result of the illegal subdivisions. The residents do not have easy access to the financial institutions for example. Their safety is, in several cases, threatened by the unsafe structure. The poor quality of the built environment and the potential displacement of the low-income people are issues related to health and wellbeing. The dwellers in illegal land subdivision development have issues related to the community at least at the initial stages of the development.

Issue related to ethical, Justice and governance are also found in the illegal land subdivision. The violation of law and bribing the officials can represent the ethical issues. Regularising the illegal settlements raises the issues related to justice. The population integration with the city and the consequences of the regularisation constitute issues related to governance. Thus, the components of institutional issues that are found in the BEQUEST framework can be adopted into the proposed framework for illegal land subdivision.

Spatial dimensions

It is clear from the discussion in 3 and from table 1 that the spatial impact of the sustainability issues of the illegal land subdivision encompasses various levels, the building, the locality, the neighbourhood, the city and its region. Illegal land subdivision schemes which mostly produce housing and are usually not of large scale, does not seem to have issues with spatial impact at the national or international scale. Therefore, it can be suggested that the spatial dimensions of the illegal land subdivision

are building, locality, neighbourhood, city and city region.

Time scale

Short, medium and long term impacts are found in the illegal land subdivisions. Some of the impacts are of short, medium and long term at the same time. It can be suggested the time scale suggested by the BEQUEST framework can be adopted in the proposed framework. Figure 2 shows the proposed framework for assessing the sustainability issues of the illegal land subdivision.

It is hoped that this framework can help in assessing the illegal land subdivision at its various stages and in making the right decisions on the illegal subdivision. It can be considered as a tool made by now available to concerned authorities to look at the illegal land subdivision in the content of sustainability. There is still however, a need for further research efforts to develop complete tool kit components as it is available for the formal development.

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