

Green Belt Zoning for Ulaanbaatar City

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Abstract: Last decades, built-up area is expanding dramatically in Ulaanbaatar. About twenty years ago urban green belt was established in surrounding 70-75 km area or approximately 470,400 ha area to provide circumstances to amenity of urban residents, protection of urban agricultural land, forest, water and wildlife as well as rational utilization of natural resources. However, this has not been functioning effectively. Therefore seven land use zones, its' permitted land uses are recommended considering existing land use, land resources and natural condition.

Keywords: urban green belt, green belt zoning and permitted land use

1. Introduction

A green belt is a widely used planning tool to contain urban sprawl and preserve open space as well as agricultural land surrounding large cities and metropolitan. Pendall *et al.* defines that a greenbelt refers to a physical area of open space – farmland, forest, or other green space – that surrounds a city or metropolitan area and is intended to be a permanent barrier to urban expansion [5]. And green belt is a basically "Green space", "Open space" or "landscaped buffer zone" between developed areas and undeveloped areas around a town or city, protected to prevent it being built on [6]. The aim of the green belt is to prevent urban sprawl by keeping land permanently open and restricting inappropriate development or permitting most types of development in exceptional circumstances. Similarly, Amati and Yokohari defined it as "a zone of land around the city where building development is severely restricted" [1].

The origin of green belt is often linked to the ideas of Ebenezer Howard in the early 20th Century about developing "Garden Cities" around London and containing its sprawl [4]. The concept of greenbelt was first formally proposed by the Greater London Regional Planning Committee in 1935, "to provide a reserve supply of public open spaces and of recreational areas and to establish a green belt or belt of open spaces". In United Kingdom town planning, the green belt is a policy for controlling urban growth. The idea is for a ring of peri-urban area where urbanization will be resisted for the foreseeable future, maintaining an area where agriculture, forestry and outdoor leisure can be expected to prevail.

Besides London, many other cities implemented green belt concept including Ottawa and three other Canadian cities [7]; many large European cities such as Berlin, Vienna, Barcelona, and Budapest [3]; Asian megacities such as Seoul, Tokyo and Bangkok [8]; and Sydney and Melbourne [2] in Australia.

In recent times, rapid population growth in the capital city of Mongolia results in severe urban problems such as sprawl (unplanned, uncontrolled urban expansion), land speculation, traffic congestion, pollution, loss of agricultural land and open spaces for urban citizens' amenity which require the

green belt policy or concept in land use planning. Therefore this paper focuses on greenbelt for urban containment policy.

Green belt concept was first introduced in Master Plan for Ulaanbaatar city which was developed by Soviet urban planner, during socialist regime or 1970s [9]. That time, summer cottages were built in urban fringe which are called green belt cottage. In addition the green belt wasn't really planning tool for limit urban sprawl due to smaller amount in both inhabitants' number and city physical size than today.

2. Urbanization in Ulaanbaatar city

Ulaanbaatar city is the core for economic and social development of Mongolia. Mongolia is no exception to commonly experiencing urbanization pattern. However, there are two noticeable differences. First, urbanization is a relatively new trend in Mongolia, having been introduced in the middle of the last century. Second, while Ulaanbaatar is a small city compare to many other Asian capitals, in a very sparsely populated country it stands out as an increasingly congested capital, making other urbanized areas smaller by its size, services, and importance in national economy.

From the mid of twentieth century the growth of Ulaanbaatar has been particularly significant. Initially it was the main city of Mongolia which was considered the main urbanized area from that time. And the growth was in both territory as well as population number (Table 1). The growth of Ulaanbaatar city at the beginning resulted from increased birth rate and then rural to urban migration. Economic activities resulted in the arrival of population in Ulaanbaatar, together with development of light industry, construction, road and infrastructure system and a commercial and financial service, intensified farming for the urban inhabitants contributed to the urban sprawl.

Table 1: Built-up area and population number (1944-1954)

Year	Built-up area /hectare/	Population thous.persons[13]
1944	2827	41.0
1954 /The 1 st master Plan/	3375	118.4
1961 /The 2 nd master Plan/	4252	223.7
1974 /The 3 rd master Plan/	8133	335.0
1986 /The 4 th master Plan/	9864	503.3

1998	16650	649.8
2014	42391	1282

The first Master Plan of Ulaanbaatar city was produced in 1954 and updated 3 times until 1990s. At first, all were developed for 20 years, yet all were made amendment due to unaccounted rapid population growth. Along to population growth, expansion of built-up area took places and increased dramatically. During last seven decades, built-up area expanded 15 times (Figure 1) and population number increased around 31 times.

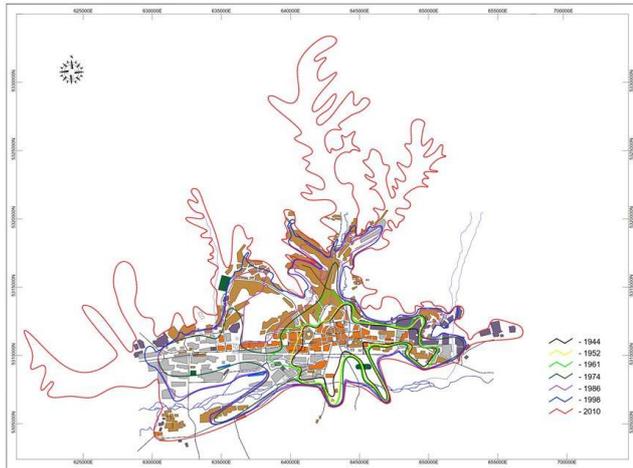


Figure 1: Expansion of built-up area of Ulaanbaatar city (1944-2014)

Although official statistics are lacking, it is believed that major part of population moving from rural area to the capital city are settled in suburban Ger area, building khashaa (khashaa - fences around ger, ger - Mongolian traditional tent) which is causing rapid urban sprawl.

3. Urban greenbelt of Ulaanbaatar city

3.1 Rationale for Urban greenbelt

The green belt territory was set up in surrounding 70-75 km area or approximately 470,400 ha area to provide circumstances to amenity of urban residents, protection of urban agricultural land, forest, water and wildlife as well as rational utilization of natural resources [15].

The territory of the capital city has attempted to be divided into following zones: "intensive urbanization zone", "non-intensive urbanization or limited industrial development zone" and "agricultural development zone" [12, 24], but land tenure, regulation, conservation and protection were not legalized.

Land use and management plan for the Capital city [10] and Ulaanbaatar city Master plan 2030 [9] state "Urban containment zone" is required to be set up to decentralize urban population, urban services and industrial cluster, to limit unplanned and uncontrolled urban sprawl, to provide amenity to urban residents interconnecting these and above mentioned documents' concepts. Therefore this "Urban containment zone" is proposed to regulated and planned as urban Green belt for the capital city of Ulaanbaatar.

3.2 Green belt boundary, purpose and objectives

The urban land in the city itself can be divided into following main parts: the built up city centre, is 12.3 thousand ha; the surrounding Ger areas 4.1 thousand ha, which the predominant buildings are gers or Mongolian traditional dwellings and houses each surrounded with wooden fence; land for public use, 6.0 thousand ha; and green space of 33.6 thousand ha.

There has been a substantial conversion of agricultural lands into urban settlement uses. In addition, last years due to the land privatization and immigration from rural area, agricultural lands are being intensely converted into Ger area. Besides conversion from agricultural land into Ger area some Ger areas and public use lands were converted into land for residential apartment blocks. The trends in land use in last decades that characterized the city were as follows: (1) a depletion of agricultural land; (2) the conversion of agricultural land to residential use, (3) the conversion of residential use to commercial use and administrative use; (4) trend towards water protection zones development; (5) development following linear patterns along major roads; and mixed use development.

Therefore, the urban growth boundary should be drawn clearly to manage this unpleasant expansion. The boundary of Green belt have been defined as following: outer boundary is set by Government Decree №326 in 1996 [15] and the inner boundary or urban growth boundary is recommended to set up taking into consideration following factors: (1) elevation, slope, forest land and water area; (2) land resource, demand for land development, engineering facility and infrastructure, water supply and provision capacity of social infrastructure (Figure 2).

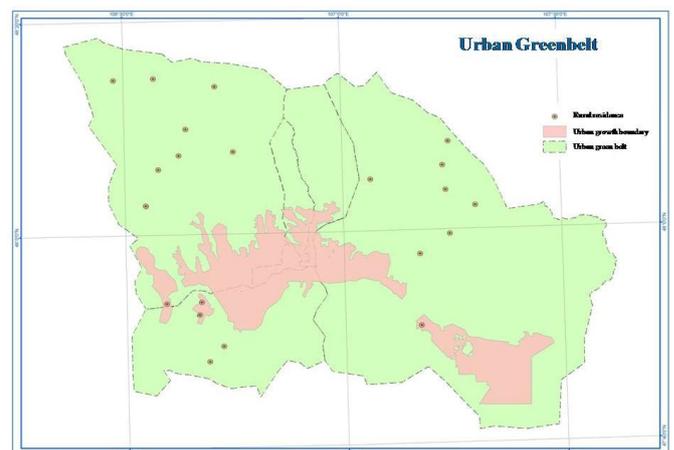


Figure 2: Urban green belt boundary

Green Belt is an area of land near to and around urbanized and urban extension zone in Ulaanbaatar. The fundamental aim of Green Belt is to prevent urban sprawl by restricting inappropriate development, provide recreational open space to urban residents as well as protecting agricultural land, environment and natural resources.

Once Green Belts have been defined, the use of land in them has a positive role to play in fulfilling the following objectives:

- to limit unplanned and undeveloped urban sprawl;
- to provide appropriate lands for the general amenity and outdoor recreation of urban residents;
- to retain land in agricultural, forestry and related uses.
- to protect drinking water source for urban population;
- to improve damaged and derelict land around towns;
- to secure nature conservation interest;
- to retain attractive landscapes and environment; and
- to recognize the development and land use limitations of environmentally sensitive lands.

4. Establishment and main purpose of zoning in Green Belt

4.1 Zones and its main purposes

However urban greenbelt territory is defined for Ulaanbaatar city in 1996, its land use and land tenure, conservation and protection regulations have not been developed. Therefore land use zones with permitted land use definition within the green belt are recommended to accomplish greenbelt concept and objectives in reality.

Seven land use zones such as agricultural, rural residential, green belt cottage, recreational, forest, ecologically restricted area and Special Protected Area are determined for the urban green belt considering existing land uses, land use requirements, natural, socio-economic factors, land resource, land quality and other features (Figure 3, 4).

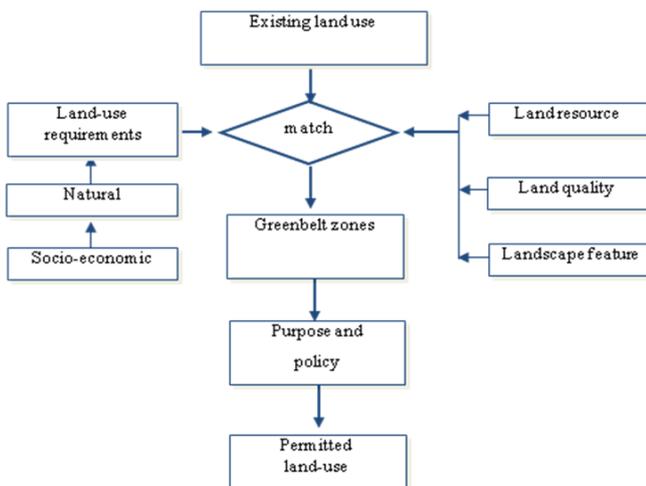


Figure 3: Green belt zoning concept

And the main purpose of the zones defined as following (Figure 4).

<i>Agricultural zone</i>	To provide adequate space for agriculture, intensive farming, haying, development or construction for essential facilities and building for agricultural purposes
<i>Rural residential zone</i>	Zone to provide area for small residences such as center for agricultural and livestock breeding industries, industrial and service center, railway

<i>Green belt cottage zone</i>	station Residential area only for summer cottages
<i>Recreation zone</i>	To provide adequate open spaces for outdoor recreation and its camping
<i>Ecologically restricted area</i>	To protect and preserve surface water and drinking water resources and ecologically sensitive area
<i>Forest</i>	All forest areas within Green belt which are not included in Special Protected Area and Ecologically restricted area
<i>Special Protected Area</i>	To preserve and maintain Special Protected Area near Ulaanbaatar city and within Green belt

Figure 4: Main purpose of zones in the Green belt

4.2 Permitted land uses in green belt zones

Agricultural land

- Livestock breeding for households
- Specialized and intensive farming
- Vacant pastureland
- Construction of new buildings and essential facilities for agriculture and farming
- Haying
- Improvement of damaged agricultural land Fodder and other vegetable cultivation
- Irrigated cultivation (may be permitted with condition)

Rural residential

- Construction of dwellings for farmers
- Construction of essential facilities for agriculture and farming
- Agricultural services
- Small and medium services and manufacturing

Green belt cottages

- Single or family summer houses only for warm seasons
- Shared parking and open spaces

Recreation

- Outdoor sports
- Outdoor recreation
- Camping

Forest

- Construct essential infrastructure facilities
- Set up stripes against forest fire
- Deforestation
- Nature conservation activities
- Outdoor recreation

Special Protected area

- Research and study using environment friendly approaches
- Nature conservation activities
- Outdoor recreation

Ecologically restricted area

Research and study using environment friendly approaches
 Nature conservation activities
 To build essential facilities for drinking water supply and water protection
 Water system intakes, pumphouses and water storage facilities

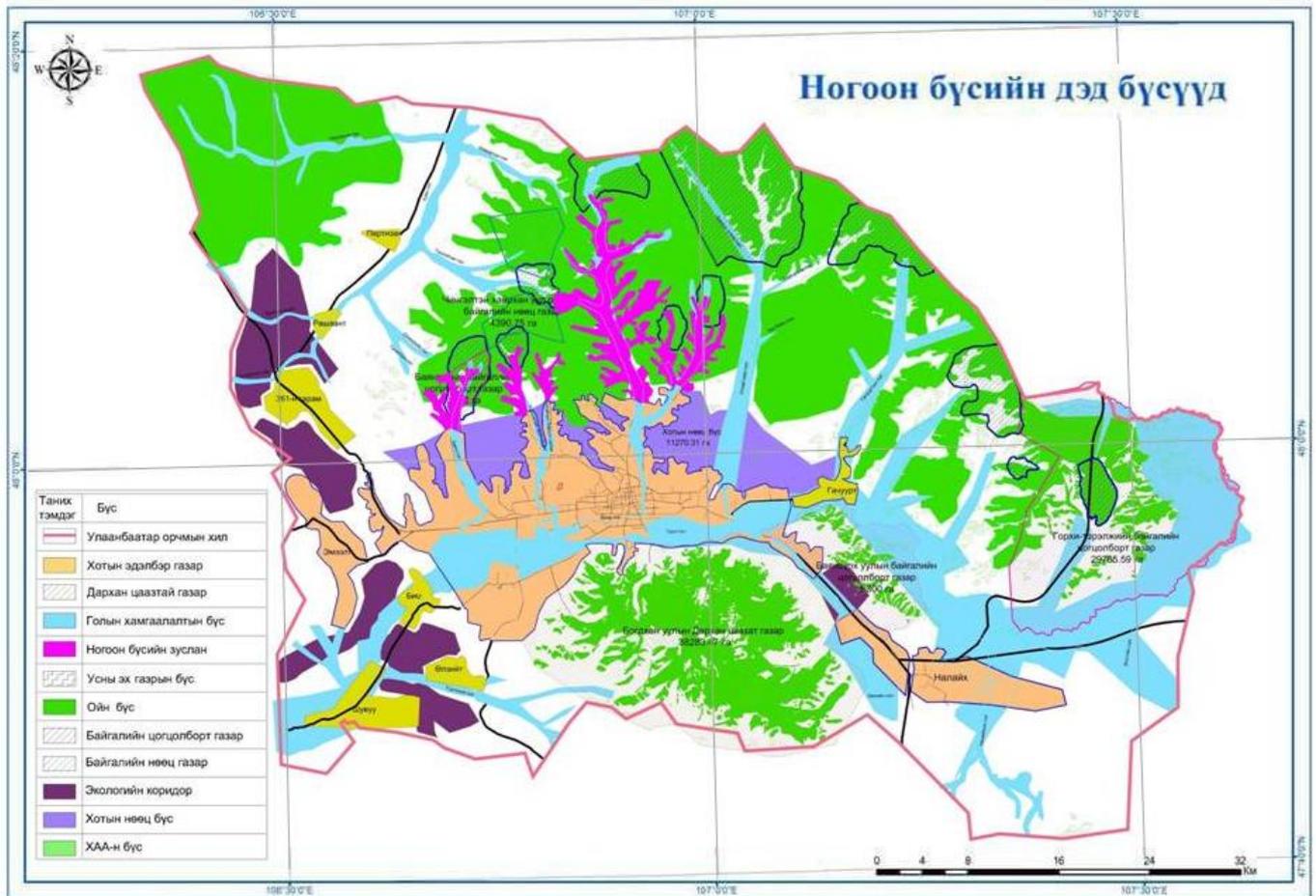


Figure 3: Urban green belt zones

5. Conclusion

Green belt is suggested as a tool to limit urban sprawl, retain agricultural land, open spaces and natural resources as well as provide opportunity to amenity of the urban population. Green belt is set up around urban extension zone and in as defined urban containment zone in Ulaanbaatar city Master Plan 2030. Outer and internal boundaries are set up under the Ulaanbaatar city Master Plan 2030, Amendment of Capital city Land Use and Management plan and other related regulations.

Seven initial zones such as agricultural land, rural residential, green belt cottage, recreation, forest, ecologically restricted area and Special protected area are classified in the Green belt and its permitted uses are discussed. Green belts will function effectively in containing urban sprawl if it has some form of institutional stability supported by influential regulation.

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Author Profile

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