

Urban Land Use Planning Influencing to Urbanization  
In the area of Wiang Nuea Municipality,  
Wiang Chai District, Chiang Rai Province

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This research aimed to study an urban planning that affects land use change and urbanization in Wiang Nuea Subdistrict Municipality, Wiang Chai District, Chiang Rai Province. The collected data through interviews, observations and related documents were in order to analyze the spatial phenomena. It was found that the former Wiang Nuea Subdistrict Municipality area had the overall city plan in the form of green area city plan, rural and agricultural land. In 2019, there was the 4 lane road cutting project from Chiang Saen 2 port from the Department of Rural Roads crossing through the area of Wiang Nuea Subdistrict Municipality resulting in a plan to adjust the overall city plan to be the form of yellow area city plan. The land utilization from the original is a low-density residential land caused by transportation routes in the area, resulting in the entry of external capital, rising land prices including the latent population in the community. This was in line with the urbanization concept of the Sector theory, Homer Hoyt, which describes the city's expansion along the way of transportation which connects to commercial centers and residences in other areas.

**Keywords:** Urban planning, Land utilization, Urbanization

## Introduction

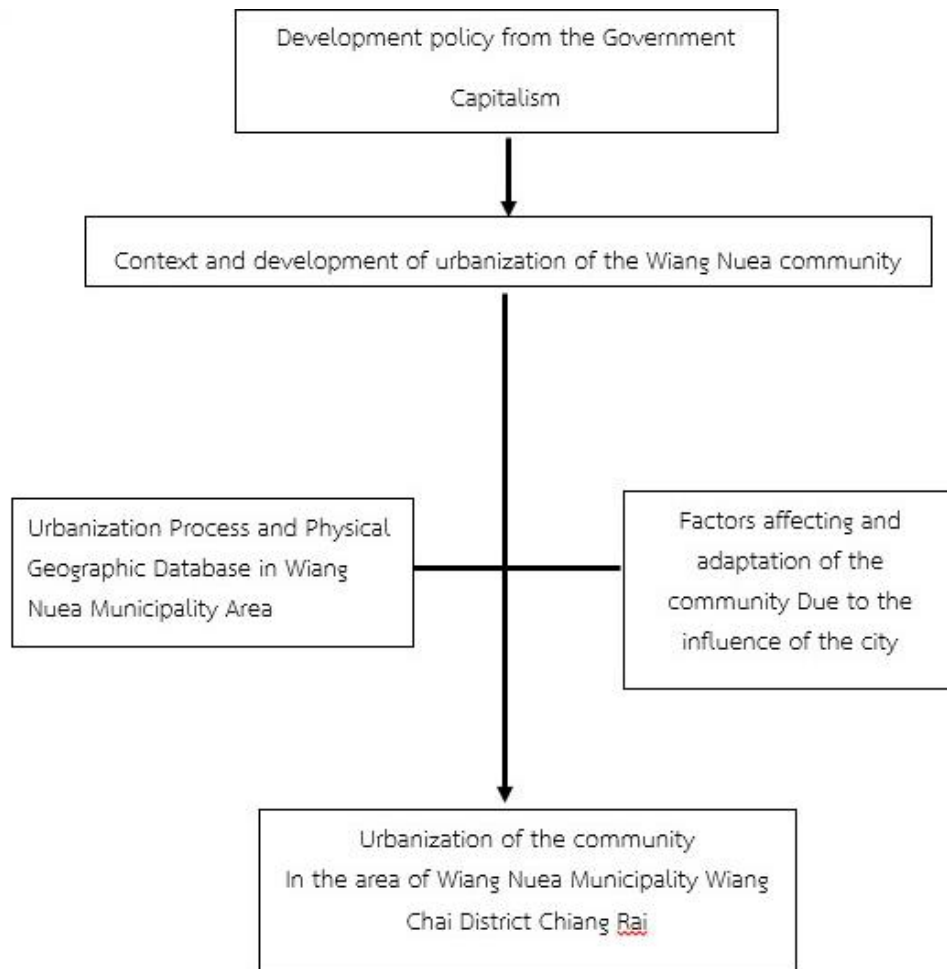
The urban planning act B.E. 1975 defines the definition of "urban planning" means the plan, preparation and operation to be in accordance with the combined town plan and the specific town plan in urban and related areas or rural areas. The objectives of this plan are as follows: to build or develop a town or new section of the town or to replace damaged towns or parts of towns in order to have or improve sanitation; convenience; orderliness; beauties; use of properties; public safety and the welfare of society, to promote the economy; society and environment, to maintain or restore a place or useful object or values in fine arts; architecture; history; or archeology or for the maintenance of natural resources; beautiful landscape or valuable in nature.

Urban planning in Thailand has a long history with the creation of the town from the past to the present time. Therefore, the essence of town planning control will consist of land use controls and population density control. This control requires the use of a zoning map, which is based on the future land use plan, which contains details showing the classification of land use which is under the development of the private sector such as the residential zone, commercial zone, industrial zone and agricultural zone. Each type of land use zone will be classified into sub-categories according to the development and specific roles of the town in the area of Wiang Nuea municipality, Wiang Chai district, Chiang Rai province. It is a community area that has characteristics of local area development that are in accordance with the characteristics and processes of urban planning and has created a 4 lane road intersection project, Chiang Saen Pier 2 from the Department of Rural Roads cut through the area of Wiang Nuea municipality, causing the adjustment of the town plan area. Therefore, the researcher is interested to study the urban planning pattern that affects the land use and the urbanization in the Wiang Nuea municipality area, Wiang Chai district, Chiang Rai province.

## Objective

To study an urban planning that affects land use change and urbanization in Wiang Nuea Subdistrict Municipality, Wiang Chai District, Chiang Rai Province.

## Conceptual framework



## Review Literature

Yuzhe Wu (2011) researched the impact of urbanization policy on land use change: a scenario analysis. The study found that the rapid urbanization has led to extensive land use change particularly in those developing countries. In line with the development of urbanization, arable land is decreasing dramatically, which presents the threat to food security for human beings. It is therefore essential to understand the level of impacts of urbanization on the land use change. This paper introduces a dynamic systems based method for assessing the impacts of urbanization policy on land use change with reference to the urbanization practice in China. Four typical policy scenarios are identified in implementing urbanization in China, including balanced development driven by planning, uneven development driven by planning, balanced development driven by market and uneven development driven by market and their impacts on land use change are analyzed through a dynamic system model. Land use change is considered as a dynamic system model composing five subsystems: urbanization, social, economic, environmental and land use subsystems. The key attributes in these five subsystems are interactive and they are dynamic variables. The assessment on the impacts of urbanization policy to land use change is demonstrated through employing the software iThink to the land use change dynamic model, using the data collected from the Jinyun County in China. The findings suggest that the urban construction land will continue to

increase in the foreseeable future in China, whilst the agricultural land will gradually decrease. Nevertheless, different policy scenarios will have different impacts on these land changes. Thus decision makers can adopt different policies to control the rate of land use change.

Jin S. Deng (2011) “An integrated analysis of urbanization-triggered cropland loss trajectory and implications for sustainable land management” this paper demonstrates an integrated method for studying cropland loss dynamics and the resultant impacts on sustainable development spanning the past 10 years (1996–2006) in response to rampant urban growth. This study deploys remote sensing to obtain accurate measures of cropland change information and applies GIS to examine the spatio-temporal trajectory of cropland loss. Coupled with landscape metrics and soil quality assessment approach, this paper also explores the impacts on fragmentation of cropland landscape and soil resource in detail. The case study concludes that cropland has undergone considerable loss from 1996 to 2006 and exhibited distinct variation of change dynamics between 1996–2000, 2000–2003 and 2003–2006. In the meantime, cropland loss was spatially concentrated in Jianggan, Xihu and Binjiang districts. However, these changes have caused an increasingly fragmented composition and dispersed distribution of cropland landscape over the time. Moreover, the study further documented a severe competition between urban development and good quality soil concomitant with the rapid urbanization process. In addition, some distinct soil types, with their unique physical structure and history of formation, may be on the verge of disappearance. The permanent loss of valuable cropland and increasing fragmented landscape patterns along with continued urban sprawl may also impose potential threat on the sustainable development and food security of the region.

## Methods

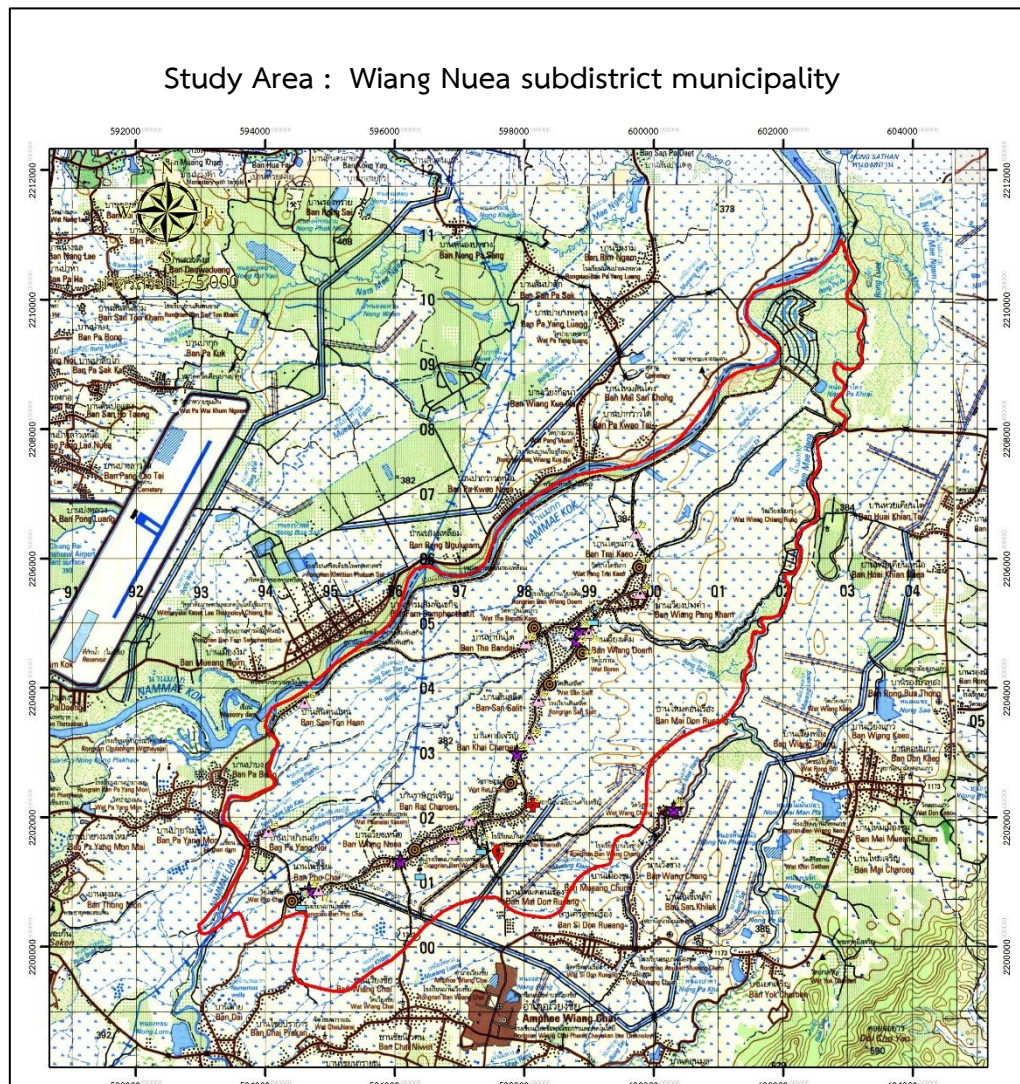
Methods of conducting this research was a study by a qualitative research methodology by using informal interview forms and observation without participation in order to analyze spatial phenomena with the aim of knowing urbanization process and public opinion from the town plan change and how land use in the area impacts the community. Sample was selected by using purposive sampling from the population of Wiang Nuea subdistrict municipality area, Wiang Chai district, Chiang Rai province as the following details; Population groups in this study would study the people in the villages in the area of responsibility of Wiang Nuea subdistrict municipality area, Wiang Chai district, Chiang Rai province.

1. Village headmen of 12 villages, the responsibility area of Wiang Nuea subdistrict municipality, Wiang Chai district, Chiang Rai province: 12 persons
2. Government officers/relevant public and private personnel including the president of Wiang Nuea subdistrict municipality, chairman of Wiang Nuea subdistrict municipality council, permanent secretary: 5 persons
3. Informal leadership groups such as sage villagers, women's leadership group, youth leader group: 5 persons

4. Community enterprise group that has changed the characteristics of agricultural activities into industrial activities: 5 persons

## Results

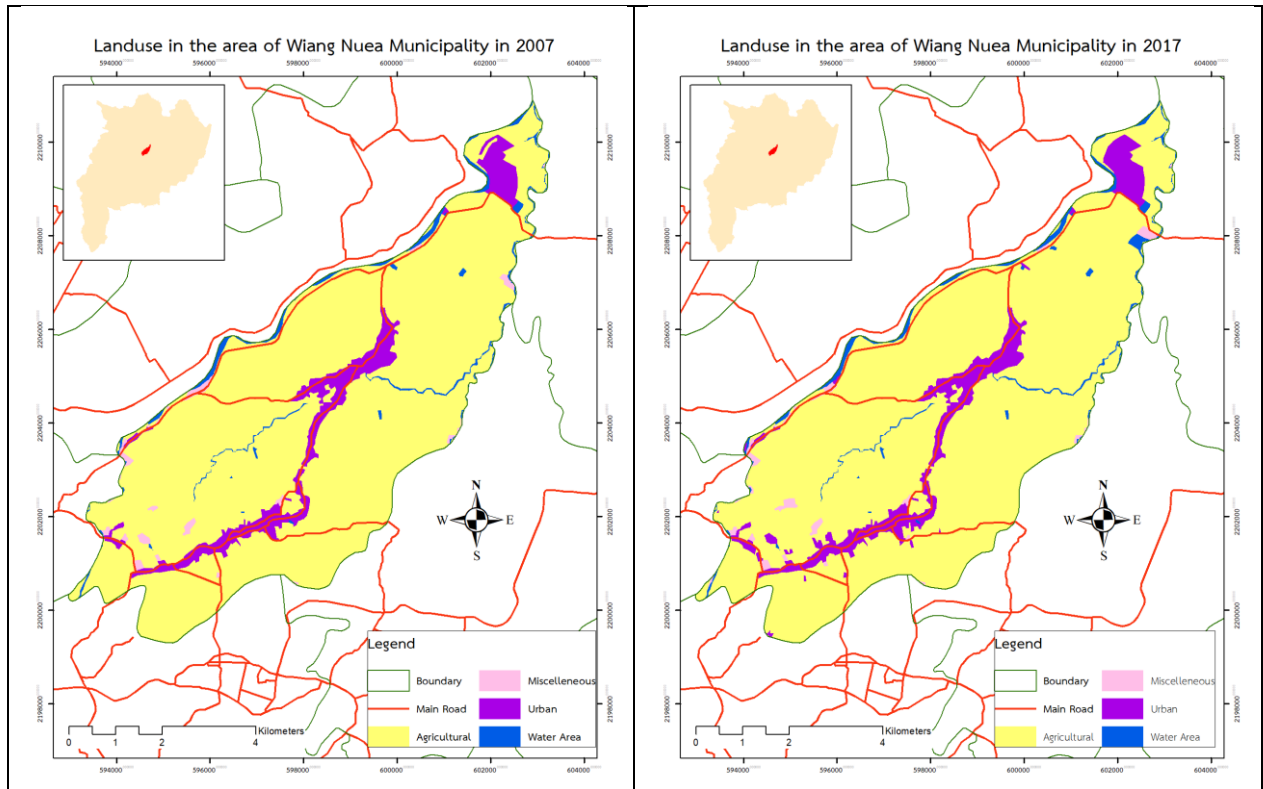
Wiang Nuea subdistrict has a landscape of plains. There are two important rivers flowing through, namely Laos River and Kok River, which are important on agricultural water resources of the community, suitable for agriculture especially a good source of soil, the water is plentiful, with Kok River flowing west and north next to Ban Tha Bandai and Ban Tri Kaew. Laos River flows through Ban Pa Yang Noi. There is also a small water source, Lao Log River, which separates from Laos River at Ban San Ton Nae, passing Ban Tha Bandai, Ban San Salit, Ban Wiang Doem and flow into Sakin River in the area of Ban Wiang Pang Kham, as well as a swamp and a small mine surrounding all 12 villages. The area in Wiang Nuea subdistrict has no mountains and forest areas or the national park. Wiang Nuea subdistrict is a distance from Wiang Chai district about 2.5 kilometers and a distance away from Chiang Rai center is about 12 kilometers.



**Figure 1** Map showing the area of Wiang Nuea subdistrict municipality

Source: Royal Thai Survey Department





**Figure 2** Map of land use changes in 2007 and 2017

Source: Land Development Department

**Table 1** Area of land use changes in 2007 and 2017

Land use changes		2017				
		Agriculture	Miscellaneous	Community	Water	Total
2007	Agriculture	25,362.08	156.59	390.59	51.11	25,960.37
	Miscellaneous	39.58	191.90	88.31	0.81	320.61
	Community	4.83	0.02	2,168.20	0.40	2,173.45
	Water	4.99	0.55	0.71	635.68	641.93
	<b>Total</b>	25,411.48	349.06	2,647.81	688.00	29,096.36

Land use change in Wiang Nuea subdistrict, Wiang Chai district, Chiang Rai province in the year 2007 - 2017 found that the type with the most increase of the area was the community. In 2007, the area was 2,173.45 rai or 7.47 percent of the total area and in 2017 the total area was 2,647.81 rai or equivalent to 9.10 percent of the total area which increased 474.36 rai. The type with the largest decrease was agriculture in 2007 with an area of 25,960.37 rai or 89.22 percent of the total area and in 2017 the total area was 25,411.48 rai or 87.34 percent of the total area which decreased 548.88 rai.

From the urbanization process analysis by using land use characteristics consistent with the interview information from government policy in accordance with the announcement

of the establishment of Wiang Nuea subdistrict administration organization to be Wiang Nuea subdistrict municipality which the Ministry of Interior considered that it was appropriate to establish a subdistrict municipality in 2003 by raising any local status to be a subdistrict municipality. The law does not specify the number of citizens and the density of the people in any way which is just as follows: 1. a locality that has sufficient population density 2. having sufficient income to perform duties as specified by the law. In practice, local authorities are often regarded as district councils, often including local government organizations, sanitation already exists which the Ministry of Interior has laid down rules for raising sanitation status is a registered municipality as follows 1. have actual income excluding subsidies in the previous fiscal year from 5,000,001 baht 2. population from 7,000 people onwards 3. population density from 1,500 people per 1 square kilometer and 4. has been approved by the local people

The subdistrict municipality is a local government organization for small towns. Generally, the subdistrict municipality has the same status as the sanitation or subdistrict administrative organization (SAO). The establishment of the municipality is made by the announcement of the Ministry of Interior raising the local status to be a municipality under the Municipality Act of 1953. The Municipality has one mayor as the head of administration and the municipal council, consisting of 12 members elected by the municipal government to act as the legislative branch. The mayor is directly elected by the representatives of the municipality. The subdistrict municipality has the duty to maintain order and cleanliness, build and maintain roads and ports; firefighting and rescue; educational services; public health services; social work and maintain good local culture. In addition, public utilities and other facilities may be provided as appropriate if the subdistrict municipality has grown to a population of 10,000 and has a sufficient income. It may be elevated to a municipality (local government organization for medium-sized town), which will have more power, duties and independence and the municipality may expand according to the expanding urban community by dissolving the neighboring subdistrict administrative organizations that have become urbanized. However, this must be in accordance with the spirit of the people living in that area.

In this regard, during the year 2017, the Department of Rural Roads proceeded to cut the 4-lane road project in Chiang Saen Pier 2 to support the 6-sided economic logistics system, laying through the area of 9 subdistricts, 4 districts connected to Phahonyothin road, to connect with the transportation system development project to link the countries in Mekong river basin, especially in Chiang Rai province, the important trade gates in the 6-sided economy from southern China through Lao People's Democratic Republic, Thailand, Vietnam, Malaysia, Singapore, Indonesia through Chiang Saen port 1-2 and R3a road. There have been feasibility studies and environmental impacts, intersection in the direction of Chiang Saen Pier 2 port, Mueang district, Highway 118 three-way intersection, convergence Highway 1, Mae Lao district, Chiang Rai province. Director of Chiang Rai rural highway said that this construction

project is expected to solve the problem, save travel time including reducing accidents as well as being able to support the transportation of passengers and goods, while being able to be part of expanding the transportation network in Mekong region, which impacts in Wiang Nuea subdistrict municipality area in the budget year 2020. It may have land use adjustment that will make future land use from the green areas, rural and agricultural land to become a yellow area, residential land type (moo 1, 8, 12) and from the Chiang Saen Pier 2 road project-Mae Lao. The area will have a road cut through the village moo 8, 9, 2, 3 in the fiscal year 2020, with the reason to make traveling easier and faster. Resulting in prosperity in the community, the pattern of investment planning and the purchase of land in the area that is expected to change from the land use type to use the green land for agriculture or related to agriculture, government institutions, public utilities and utilities are mainly the use of yellow land, residential land type, tight little. That may lead to more land use patterns in urbanization. There is a plan to invest in the area, both near the main road lines and areas that have future town plans.

As mentioned above, various problems occur due to growth and the changing conditions of the town and cause many problems, but can be prevented and solved if there are the development plans in advance. There is coordination between various departments for proper development. Therefore, urban planning is important because the overall urban planning in urban areas or municipalities determine the future physical development of the town. It will make the town or municipality have a clear plan and policy and to be a framework for development for the public and private sectors. It will make the town development to be effective and in line with the economic development plan and society of the country according to the national economic and social development plan.

## Discussion

From the results, it can be seen that the phenomena in the area have started to plan the use of the area as well as the investment in the area that comes from transportation building, intersection road in the direction of Chiang Saen Pier 2, Mueang district, Highway 118 three-way intersection, convergence Highway 1, Mae Lao district, Chiang Rai province, which are consistent with the concept of urbanization of Sector theory, Homer Hoyt, which describes the town's expansion, will expand along the transportation routes which connects to commercial centers and residences in other areas. It explains that the expansion of the town is caused by the center of the town that is the center of the main transportation routes of the town. The influence of the transportation route will cause the town to expand along the route of cars, subway and train. Most people would like to live in a dense neighborhood near the transport routes within easy walking distance. Later, the town has improved communication routes. People in the town prefer to use cars more. The empty space between the transport routes will have more people to live together. The empty spaces are connected into one area. Furthermore, the issue of the urbanization process that has elevated



governance from sanitary districts to district councils in accordance with the characteristics of urban communities in Thailand. Yarnsarn,S. (2011) summarized the characteristics of urban communities in Thailand, the growth of urban communities or general municipalities were still low for 50 years ago (1947- 1996). The urban communities in Thailand increased slightly; however, the number of Thai urban communities increased to 1,130 towns in 2000 and 1,620 towns in 2008 as a result of sanitation being granted to subdistrict municipalities. However, the municipality still does not have real urban characteristics. And this research is related with Yuzhe ,Wu,. (2011) the impact of urbanization policy on land use change: A scenario analysis. This paper introduces a dynamic systems method for assessing the impacts of urbanization policy on land use change with reference to the urbanization practice in China. Urban land use will continue to increase in the foreseeable future in China, whilst the agricultural land will gradually decrease. Nevertheless, different policy scenarios will have different impacts on these land changes. Thus decision makers can adopt different policies to control the rate of land use change.

### Conclusions and Implications

According to studies, it found the urbanization process of Wiang Nuea subdistrict municipality, the factors affecting urbanization process and its impact on Wiang Nuea subdistrict municipality. The main point was to upgrade the administrative characteristics from the subdistrict administration organization to Wiang Nuea subdistrict municipality in 2003, which the town was in line with ideas about the process of urbanization. According to the definition of the urbanization process, it is a movement from simple units and has a high degree of localization to a complex and expanded system, with organized towns. The rate and degree of urbanization can increase depending heavily on the technology used to organize the organization for coordination from every part. The suburb expansion is the nature of the changes caused by the expansion of the town when the suburbs have a population moving into denser settlements. There is a prosperity in both utilities and consumption which are some indicators of the urbanization process.

Development by project management, the importance of the overall town planning in that town: It will be a support for the government and private sectors to achieve development objectives because of various community problems that arise. For example, road systems that do not meet the standards can cause accidents easily. The drainage is not a good system causing problems affecting the shop buildings and land use lacking regulations since there is no major planning to proceed causing the expansion of the town to not be within these frameworks or guidelines correctly. This can be seen from the phenomenal situation in Wiang Nuea subdistrict municipality area which is currently in the development phase in line with the transportation route construction project and is linked to the process of urban planning allocation to intervene in the process of the changes.

Empirical observations of how urban areas develop, such as the emergence of polycentric urban configurations, often defy the simple assumptions of pure neoclassical

urban theory. In contrast to the fundamental assumption in the neoclassical city model that employment was concentrated in central business districts (and gradually decreased with increasing distance to the urban core), modern agglomerations in developed countries are characterized by their multi-nodal settlement system, with a complex pattern of primary and secondary centres (Garreau 1991; Champion 2001; Davoudi 2003). Accordingly, many additional factors other than land prices and commuting costs have been identified that affect the location decisions of individual households or firms (Nechyba and Walsh 2004). Examples include the quality of urban services, specific priorities and demands of different social groups in terms of urban and environmental amenities, or the desire to live in a socially homogeneous neighbourhood. The Tiebout Local Public Finance Model (Tiebout 1956) suggested that people decided to locate in a particular jurisdiction based on their preferences and taste for local amenities. Tiebout described factors that “pull” people out of the central areas of metropolitan regions on account of attractive characteristics of suburban communities (e.g. good service levels or lower taxes) and others that “push” people out of central areas as a result of inner city problems such as poor environmental quality and services, or crime. Theoretical accounts of this nature hint at the importance of particular social-cultural trends that mould the current demand for urban land, such as the proliferation of both land-consuming urban lifestyles (tourism and recreational activities, second homes) on the one hand and a (re)orientation (particularly among upper middle-class households) towards urban centres (“reurbanisation”) on the other.

With urban sprawl and land consumption being a major environmental concern, recent scholarly efforts have broadened the knowledge on its causes and drivers significantly. However, while it is often possible to explain the intensity of urban land use change on a broader scale, e.g. on the European (Oueslati et al. 2015) or global scale (Creutzig et al. 2019), predicting its spatial patterns remains a challenging issue. As a consequence, spatially explicit land use models have been developed which not only explain at what rates urban land use change occurs in a given period of time, but also address the question where it will take place, i.e. its likely location (Frenkel 2004). Poelmans and van Rompaey (2010) have distinguished five groups of explanatory variables that have been frequently used in models of urban land use change:

1. Biophysical factors, such as the slope or water table, have an impact on the suitability of land tracts for the construction of buildings or infrastructure facilities, and can explain why certain areas are excluded from development.
2. Social factors reflect the location preferences of households (or household types). Examples include the income level or ethnic composition of nearby neighbourhoods, and the availability of open green spaces. These factors may encourage or discourage a household's choice of development site.
3. Economic factors refer to accessibility features as proxy values for market access. Frequently used measurements include the distance to urban centres or main roads, and the

availability of public transport services within a walkable distance. Undeveloped properties with good accessibility are more likely to become urbanised in the future.

4. Neighbourhood interactions refer to an observed spatial autocorrelation between new developments and existing urbanised areas. In contrast, some potentially conflicting land uses (e.g. residential and industrial development) are unlikely to be located directly next to each other.

5. Spatial policy and planning include the possibility to legally define, i.e. distinguish the usability of different land parcels. These policies can be labelled “negative planning” inasmuch as they aim to protect current land uses (habitat conservation, prime farmland) or “positive planning” inasmuch as they define the suitability of a piece of land for a specific use (i.e. where they explicitly designate sites for urban development).

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