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LAND USE CHANGE AND RELATED PROBLEMS UNDER URBANIZATION IN SUBURBAN AREA OF HA NOI CITY (A CASE STUDY OF HOANG LIET COMMUNE, THANH TRI DISTRICT)

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Abstract

This article deals with land use change under urbanization and related problems on land management, market of real property, quality of human landscapes in a sub urban commune of Hanoi City.

Key words: Land use change, land management, real property market, human landscape

Introduction

Nowadays, urbanization process is going on in Vietnam, especially in Hanoi City. This urbanization has a very strong impact on land use and related problems on land management, quality of human landscape.

Hoang Liet is a suburban commune located outer Hanoi city in the south. Its total population is 7,735 person (in 2000), and the area is 467.09 ha. Hoang Liet has the boundaries with communes of Yen So in the east, Tam Hiep in the south, Dai Kim and Thanh Liet in the west and Thinh Liet in the north (figure 1). Hoang Liet commune consists of 5 villages (Phap Van, Linh Dam, Bang A, Bang B and Tu Ky). The distance from Hanoi center to Hoang Liet is less than 9 km. This location makes the Hoang Liet to have advantages for commune development in one side, and also disadvantages as complicated land management, water environment in other side.

The land law of Vietnam in 1993 shows that “Investigation, survey, measurement, evaluation and classification of land and cadastral mapping, Land use planning and land use plans” (Article 13). “The People’s Committee shall direct the land management office under its control and the People’s Committees at lower levels to monitor changes in land area, land category, land user, and timely update land records to reflect the current land use situation in their respective localities” (Article 14). “Cadastral maps shall be made in accordance with administration units of rural and urban commune and commune town” (Article 15).

Therefore, investigation of land use change and related problems is very necessary for the commune of Hoang Liet.

Data and methods used

Main materials used for writing this paper are topographical map 1:10.000 conducted in 1994; data of land use collected from survey in the commune in 2002 - 2003, data of water quality from Vietnam - Canadian project “Remote sensing - GIS - Environment - Health”.

The main used methods are:

- GIS for land use mapping and calculating areas of land use type and land use change (Arc/Info, PCI and Map/info software).
- Questionnaire for collecting qualitative data on land management, real property market.
- Statistic analysis of collected data on land use, environmental quality.

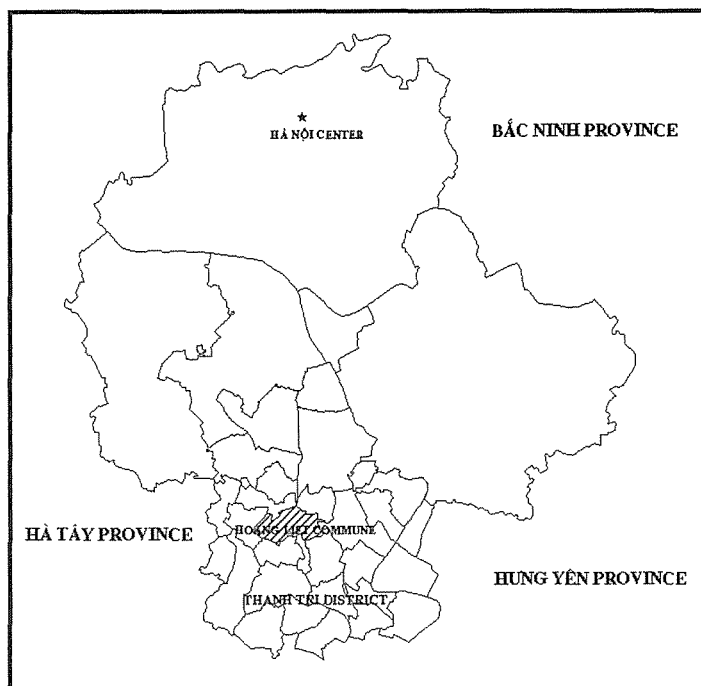


Figure 1. Location of Hoang Liet commune

Results of study

Factors influencing to land use change

- 1) Location of Hoang Liet commune is not far from Hanoi center. It's one of most important factors influencing to land use change under urbanization.
- 2) Urbanization process and socio-economic development of Hanoi have an influence to land use change in Hoang Liet commune more strongly from 1995 up to now. According to the space planning of Hanoi City in 1995, Hoang Liet commune is located in suburban zone. After the announcement of this space planning land use has daily changed.
- 3) Land law of Vietnam conducted in 1993 allows that "Household or individual receiving land allocated by the state shall be entitled to exchange, transfer, lease inherit mortgage the land use right" (Article 3).

Urbanization and economic development in scope of Hoang Liet commune require spaces for settlement and industrial location. This causes some conflicts between land demands for agriculture, fishery and settlement...in the investigated commune.

Land use change may create a diversity of human landscape and every human landscape has intellectual, cultural and environmental values that are important for life of local people in Hoang Liet commune.

Land use change and its related problems on land management

1) Land use of Hoang Liet commune in the period of 1990 - 2002.

According to the collected data, land use of Hoang Liet commune is divided into 4 categories: Agricultural land, Settlement land, Land for special use and Non - used land.

Every above land use type has a different change on different period of urbanization 1990-1995 and 1995-2002 (Table 1).

Before 1995, Hoang Liet has been an agricultural commune. Agricultural land occupied the first place, its area was 316.03 ha (67.66% of total area). Among this land the annual cropland (rice and other annual crops) is 233.90 ha (50.08%) and wetland for fishery: 82.13 ha (17.58%). For this commune in 1995 there

was no urban settlement land; the rural settlement land was about 37.57 ha (8.04%); the land for special use was 106.07 ha; non- used land was 7.42 ha (22.71%).

After 7 years of socio-economic development, a structure of land use in 2002 in Hoang Liet commune is different from 1995 year. Agricultural land has the second place after the type of land for special use. The use of agricultural land in 2002 is only 203.56 ha (43.58% of total area). Among this, the area of annual cropland (88.32 ha) is less than wetland for fishery (115.24 ha). The settlement land of Hoang Liet is 48.14 ha (10.30%), especially, urban settlement land is presented. It has an area of 5.13 ha, non- used land has 3.22 ha, it is mainly non- used wetland, as stream and small swamp.

2) Land use change in period of 1995 - 2002 and related land management problems.

a) Agricultural land decreased

In Hoang Liet commune, the agricultural land is the reserve source for other uses. Therefore, during the period of 1995 - 2002, area of agricultural land is decreased from 316.03 ha (1995) to 203.56 ha (2002). A rate of this decrease is about 16.07 ha/year (Table 1). In the scope of agricultural land, annual cropland is decreased rapidly (20.70 ha/year), but wetland is increased with rate of 4.73 ha/year. That is because of high demand on agricultural land for expanding settlement land (rural settlement land - 43.01 ha, urban settlement land 5.13 ha) and land for special use (101.9 ha) (Fig. 2).

b) Settlement land increased with urban land appearance.

Increasing of population of Hoang Liet and project of new settlement area in Linh Dam zone need land for expanding both of rural and urban settlement land. Rural settlement land is increased with rate of 0.78 ha/year, and urban land with 0.73 ha/year. The urban land chiefly is located in Linh Dam and Phap Van area.

c) Land for special use with high increasing rate. This type of land use is more complicated. It includes land for road, army service, schools, factories and other. Total increasing area of this land is about 212.27 ha (approximately 45.44% of total area), so that every year, the increasing rate is 15.17 ha/year.

Table 1. Existing land use and land use change of Hoang Liet commune in periods 1990 - 1995, 1995 - 2002

Land use type	Unit	1990	1995	2002	Land use change			
					1990 - 1995		1995 - 2002	
					ha	ha/year	ha	ha/year
1. Agricultural land	ha	328.86	316.03	203.56	- 12.83	- 2.56	- 112.47	- 16.07
	%	70.41	67.66	43.58				
- Annual crop land (Cr)	ha	216.07	233.90	88.32	+ 17.83	+ 3.57	- 145.58	- 20.80
	%	46.26	50.08	18.91				
- Wetland for fishery (Wf)	ha	112.79	82.13	115.24	- 30.66	- 6.13	+ 33.11	+ 4.73
	%	21.15	17.58	24.67				
2. Residential land	ha	36.94	37.57	48.14	+ 0.63	+ 0.13	+ 10.57	+ 1.51
	%	7.09	8.04	10.31				
- Rural settlement land (Ru)	ha	36.94	37.57	43.01	+ 0.63	+ 0.13	+ 5.44	+ 0.78
	%	7.09	8.04	9.21				
- Urban settlement land (Ur)	ha	0	0	5.13	0	0	+ 5.13	+ 0.73
	%	0	0	1.1				
3. Land for special use (SU)	ha	95.01	106.07	212.27	+ 11.06	+ 2.12	+ 106.20	+ 15.17
	%	20.34	22.71	45.44				
4. Non - used land (NU)	ha	6.28	7.42	3.12	+ 0.14	+ 0.03	- 4.2	- 0.60
	%	1.34	1.59	0.67				
Total	ha	467.09	467.09	467.09	0	0	0	0
	%	100	100	100	-	-	-	-

Reasons of above mentioned land use change can be distinguished as the followings:

- Space planning of Hanoi city has an impact to land use planning of Hoang Liet commune that includes new urban area (Linh Dam), regulating lake of Yen So, building infrastructures as road, schools, factories...
- Market economics pushes the changing the low effective land use types to higher effective (rice cropland is changed to land for fishery and settlement), increasing land space demand, for investment projects.
- Transfer of land use right is not controlled.

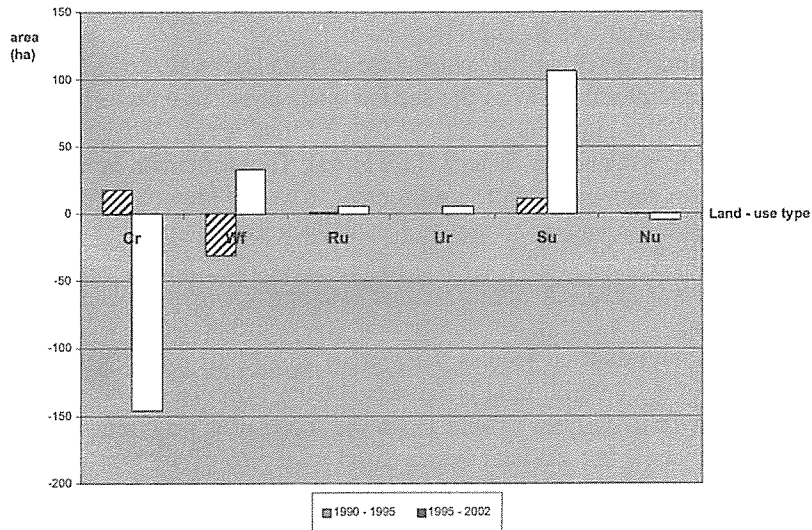


Figure 2. Land use change in Hoang Liet commune in period 1990 - 1995 and 1995 - 2002

d) Predicting land use change until 2020

Based on the data of land use change in Hoang Liet commune for the period 1990 - 1995 and 1995 - 2002 (Table 1), relationship between land use types was investigated and a model for predicting land use change in period 2003 - 2020 has been established (Figures 3 and 4).

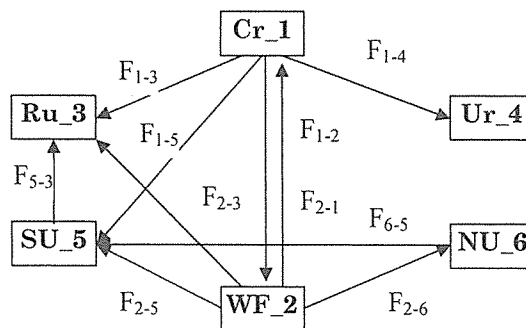


Figure 3. A model of land use rotating in Hoang Liet commune (Period 1990 - 1995 and 1995 - 2002).

In here:

Cr_1: Crop land; *WF_2*: Wetland for fishery; *Ru_3*: Rural settlement land; *Ur_4*: urban settlement land; *SU_5*: Land for special use; *NU_6*: Non - used land.

F_{i-j} : quantitative variables = area flow from land use type "i" to land use type "j" (ha)

The results of estimation by using the model show that:

- There were strong changes of land use types in the periods of 1990 - 1995 and 1995 - 2002, especially in 1995 - 2002. By this change rate in land use, the cropland is decreased rapidly (about 67.02% in 2020); the land for special use is increased rapidly and will reach about 296.01 ha in 2020.
- The settlement land has an increasing tendency: about 21.55% for rural settlement land and 103.51% for urban settlement land. While, the wetland for fishery and non-used land have decreasing tendency: about 8.18% for wetland for fishery and 25.64% for non-use land.

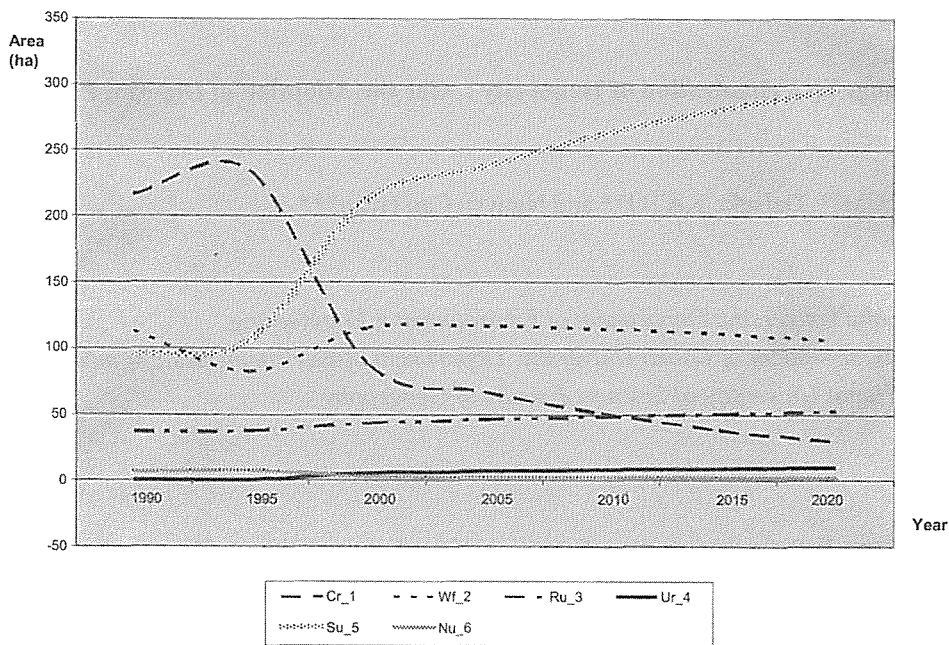


Figure 4. A graph of predicting land use change in Hoang Liet commune until 2020

3) Unexpected increased price of real property

Real property includes land and constructions built on land (houses, enterprises...). This paper focuses mainly on land price change under urbanization. In Hoang Liet commune, an irregular market of land is going very ebulliently, especially from 1995. A price of land was continuously increased for all types of land use (settlement land, agricultural and non-used land), but the highest price is for land plots that have a good location (near the road, comfortable for commercial works). For example, during 3 years from 1999 to 2002 a price of land use right is increased in 4 - 8 times for Linh Dam area, and in 3 - 5 times for other villages.

4) Land management complicated

The strong change of land use and transfer of land use right have complicated land management for Hoang Liet commune. Projects need spaces for building infrastructure, therefore works for flooring spaces and compensation have to do at the same period. Together with this, land management is more complicated, cadastral map often has to update new land plots because of land use change.

5) New human landscapes created and its living environment

Human landscape can be understood as landscape that has made by man due to economic development activities. In Hoang Liet commune we can distinguish the main types of human landscape as the following:

- Planned urban settlement landscape;
- Suburban settlement landscape;
- Rural settlement landscape;
- Industrial landscape;
- Agricultural rice field landscape;
- Waterscape.

The planned urban settlement landscape is located in Linh Dam area. This landscape includes high buildings, parks, garden - open space and service basis. Living conditions as electricity, living water supply and infrastructure in this landscape are more favorable than in rural landscape.

Rural settlement landscape in Hoang Liet step by step is urbanized, and become suburban landscapes. For this landscape, we can mention some characteristics:

- To remain some traditional features in structure (low houses with gardens), and in development of some traditional as noodle making, wood - furniture making.