EQA - International Journal of Environmental Quality
ISSN 2281-4485 - Vol. 36 (2020): 23-35
Journal homepage: https://eqa.unibo.it/

published by

Factors that affect land values and the development of land value maps for strengthening policy making in Vietnam: the case study of non-agricultural land in Quang Ninh province, Vietnam

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Article info
Received 13/8/2019; received in revised form 18/9/2019; accepted 30/9/2019.
DOI: 10.6092/issn.2281-4485/9771
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Abstract
This study is a part of the outcomes of Vietnam Academy of Science and Technology's project on "Establishing the evaluation method and the process of transferring values of natural resources into the national account system in Vietnam" (Climate Change code 14/16-20). The overall objectives of the study are: re-systemizing the classical and modern theories as well as identifying the factors affecting the land values in Vietnam; developing procedures and methods of mapping suitable land value areas in order to support the Government in policy making and regulating land use rights market in Vietnam. The results have classified three groups of factors that have impacts on land values in Vietnam. In particular, based on the successful test results in Quang Ninh Province, Vietnam, the research team discussed issues relating to land management institutions, issues of prices, land values in the context of applying the universal ownership regime to land and developing a socialist-oriented market economy in Vietnam. These results show that "the use of value theory and the development of land value maps helps the Government effectively manage and regulate land use rights market in Vietnam".

Keywords
land value, value zone map, non-agricultural land, Quang Ninh province, climate change code 14/16-20

Introduction

Land is the premise for allocating production space for economic activities such as industry, agriculture, transportation and human living space. The value of land and mapping land values are among the topics discussed very early by scholars, both theoretically and practically. Prime examples of scholars include William Petty (Mcgovern, 27); David Ricardian (Bidard, 2014); Von Thun'e'n (1783-1850) (Elbarmelgy et al., 2014); A. Myrick Freeman (Freeman III et al., 2014). Based on the theory of land value, other authors in the field of economic positivism have used models to quantify land values.

Vietnam applies the "universal ownership" regime. Accordingly, "Land belongs to the entire-people and the State acts as the representative of the land ownership and uniformly manages land which also belongs to all the people. The State grants land use rights to land users based on the Land Law" (Vietnam National Assembly, 2014). Simultaneously, Vietnam's economy is operated on the basis of "socialist-oriented market economy institution". In recent years, institutions and methods of land management have been gradually improved to meet the country's development requirements. However, land management and regulation, especially land relations in the economy, have some limitations. One of the issues is currently the "simultaneous existence of two types of land prices: state-issued prices and market prices", leading to inequality in implementing policies

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EQA 36 (2020): 23-35

DOI: 10.6092/issn.2281-4485/9771

on compensating and site clearance when the State acquires land (Tran Thi Minh Chau, 2013). Although the State has attempted to adjust land valuation methods to be closer to market prices, the gap is still high. The overview of domestic research shows that the evaluation and mapping of land value areas are still something new but very meaningful to help the Government recognize fluctuations in land values in the economy, thereby adjusting land prices, taxes and fees to ensure social equality.

This study aims to find useful tools, make recommendations to help the Vietnamese Government recognize the true values of land to make policy decisions for managing and regulating land market in Vietnam to ensure efficiency and equality.

Literature Review

- William Petty (1623-1687) (Mcgovern, 27) in "Wealth, Stock or Provision of the Nation" discussed labor, land and claimed that "labor is the Father and active principle of Wealth, as Lands are the Mother". Although this statement does not have a specific viewpoint about land values, it is fundamental for future arguments and research on the value of land .

- "Principles of Political Economy and Taxation" by David Ricardo (1772-1823) explained the inconsistency between price and value. When examining land rent, Ricardo stated that "Economic rent on land is the value of the difference in productivity between a given piece of land and the poorest [and / or most distant], most costly piece of land producing the same goods. (e.g. bushels of wheat) under the same conditions (of labour, capital, technology, etc.)". The author also analyzes and concludes that rent increases as the population increases. Hence, Dicardo's study reveals that land quality and population have impacts on land values. (Suman)

- According to economist Von Thunen (1783-1850), the distance from the land to the output market determines the values of that land. He builds a model to prove that land returns are dependent on farm profits minus product transportation cost. The model also allows accurate land use prediction based on the distance to urban areas (Elbarmelgy et al., 2014).

- A. Myrick Freeman from Bowdoin University, United States in "Measuring the value of natural resources and the environment: Theory and methods" (2003) analyzed the theoretical model of calculating economic values of land and houses in chapter 11, "Real estate value models". There are two main approaches to measure the economic values of land and houses: Theory of Rents and the modern approach of Hedonic Theory. The economic theory recognizes that the profitability of land varies by location. Differences in profitability will lead to different economic rent levels, thus create different economic values for the land. The Hedonic Theory states that environmental characteristics such as air and water quality can have impacts on profitability of land both in the form of producer goods and consumer goods. The structure of ground rent will then reflect the differences in profitability which is determined by this environmental factor (Freeman III et al., 2014)

- Phe and Wakely (2000) in "Position, quality and other options: Towards a new theory of urban population position": Position and quality quantification can be implemented either through estimating a proxy by a ranking process, or through estimating inferred prices of attributes related to position and quality of land. From this point of view, goods can be exchanged because of its economic values and market values. Therefore, buyers need to have market values and sellers are able to perform a valuable exchange.

- A study by Perry (2018) examines the value of farmland by mapping assessor data to have a better understanding about land use change. Using ArcGIS, the author comes to several conclusions : (i) land value is at its highest in the middle of the city center and gradually decreases towards the edges of urban system as well as rural areas; (ii) values of residental lands and farmland show similar trends since both experience a decrease in density as the distances from the city center are greater. Landuse changes are shown to be clustered in urban areas. Zrobek et al. (2005) analyzes impacts on spatial differentiation of prices and real estate values which have not been developed but are aimed for building houses. The study includes calculating transaction price registration layer in ArcGIS. This layer should allow displaying "information of a transaction indicated on the map; selecting real estate properties based on attribute values; and presenting statistic values for real estates". The range of land values can be represented by isolines showing the same value or by isolated zones, where "a relative uniformity of price-determining factors are assumed". This method could be useful for analyzing preferences of real estate purchasers. Mostafa (2018) found that land price is positively influenced by population density, percentage of locals in Kuwait over the total population and schools, while it is negatively impacted by air pollution. Moreover, land prices in Kuwait are often clustered in groups/ hotspots. Hotspots are detected by the Kernel Density Estimation (KDE) method. Li and PGRNI (2015) determines

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DOI: 10.6092/issn.2281-4485/9771

the market value of land by using seven parameters: distance to schools; distance to roads, distance to police station; distance to railway station; distance to health facilities; types of land and distance to government buildings. ArcGIS software is used to create shapefiles for each of the above factors. Analytical Hierarchical Process (AHP) and surveys are also utilized to establish weights. The study area is divided into land value classes and classified as "very low, low, moderate, high and very high valued areas". The results show that the total area has many moderately high and high land values. In another study by Elmanisa et al (2017), information and data of land prices are collected through sampling method. This data is then processed and represented on isoline maps on ArcGIS. Land price data sampling is done by interviewing real estate business stakeholders as well as websites and finance magazines. The isoline map ultimately shows the significant differnces in land prices among different regions of Jakarta.

- The above results from past research indicate that: (i) the study of land value has been developed by many scholars with various viewpoints and theories but there still remains a lack of comprehensiveness, especially in the current context; (ii) the study of land value in Vietnam has been discussed and brought up, but the topic has been neither throroughly analyzed in theories nor put into practice; (iii) Developed countries such as Japan, the USA, Sweden, China have sucessfully applied mapping land value, showing that this is a very useful tool that helps governments anticipate fluctuations and changes in land prices and it is the premise for proposing policies of compensation, assistance, taxes and fees to regulate the market. However, this is still something new to Vietnam.

Methodology and Research Design

Methodology

Desk study method. Uses the Desk study method collects research and studies of land values to identify factors affecting land values, theories of land values, to apply outcomes of land value maps in reality, to collect secondary data relating to land values in Vietnam in general and Quang Ninh province in particular to serve the testing processes.

Modeling method. based on the land value factors determined by the SPSS tool, ArcGIS is used to run a regression model in order to produce a land value map in Quang Ninh province, Vietnam.

Policy analysis method. Recognizes the limitations in managing and regulating the land market in Vietnam, thereby relating theories of land values to mapping land value areas for policy recommendations.

Research design

The procedure of this study is illustrated in Figure 1. After reviewing past research, the study clarifies viewpoints on the Price Theory and factors affecting land values; determines the method of developing a land value map. Next, the database used for testing in Quang Ninh province, Vietnam is colllected.

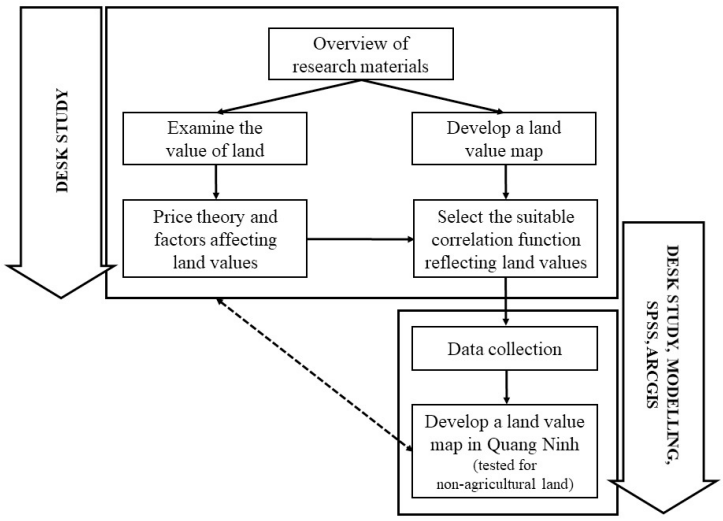

Figure 1. Research design diagram

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DOI: 10.6092/issn.2281-4485/9771

Results and discussion

Factors affecting land values

Based on theories of value and an overview of past research on land values, three groups of factors involved in land price formation are identified: (i) distance factors; (ii) socio-economic factors; (iii) environmental factors. More details are provided in Table 1.

Develop a land value map

According to Ardiwijaya (2006), Lien (2009), a land value zone is a geographic area that comprises of the same land units (pixels) impacted by natural, socio-economic, environmental and legal conditions and it is expressed in monetary values. Land value zones are classified based on usage purposes including agricultural land value zone and non-agricultural land value zone. Every zone has a standardized price, which is the average of the market price range. The number of standardized prices or the number of value zoning levels will be uniformly determined in each valuation period. Developing a land value map is a process that assesses the potentials of a location and quantifies the position and quality of land. Each land parcel has a certain value. This value remains constant if factors involved in land parcel price formation do not change. An area that is not divided into parcels will have a primitive value. Different attributes of land parcels will lead to different prices. Factors such as direction, area, facade, shape have created differences in price between two adjacent parcels, even if the two parcels are within the same land value zone.

Table 2. Factors affecting land value formation (Source: Collective author, 2019)

Factors	Explanation
I. Distance	
1. Distance to city center	Each city has a central location, which is often a starting point for provincial roads, or a post office of the city.
2. Distance from the land to the People's Committee at the study area	The impacts of this type of distance on land values are: convenience, accessibility to the State public agencies and stability of the city. The People's Committee is often considered the administrative center of the residential area.
3. Distance to the police station	Indicates safety and security level of the area.
4. Distance to schools	Closer distances are essential for families so that they can take their children to school easily. Schools include Primary, Middle and High schools.
5. Distance to colleges, universities and vocational schools	Indicates the advantages of accessing to training and educational centers.
6. Distance to health facilities	The distance to health centers and hospitals indicates accessibility to health facilities, medical examination and treatment.
7. Distance to markets	Markets are one of Vietnam's characteristics. This factor indicates accessibility to food and groceries. Selected markets are markets with adequate infrastructure (toad markets are not included).
8. Distance to supermarkets and shopping malls	Distance to supermarkets and shopping malls adapts the residents' shopping needs.
9. Distance to centers of culture, art, museums, theaters and sports	Adapts the needs for cultural, arts and sport activities.
10. Distance to parks and outdoor play areas	This is for daily entertainment for people at all ages.
11. Distance to kindergartens and public pre-schools	Facilitates accessibility for families that have children at preschool age.
12. Distance to bus and railway station	Makes travelling more convenient for the residents.
13. Distance to national historic sites	Residential areas that are near the national historical sites will be more valuable the others. This will bring cultural influences and spiritual values to the residents.
14. Distance to tourist destination	Tourist destinations such as resorts, ecotourism destinations.
15. Distance to pollution sources	Lands that are close to pollution sources such as chemical plants are heavily contaminated, directly affecting the residents and their health.

DOI: 10.6092/issn.2281-4485/9771

Factors	Explanation
16. Distance to noise pollution point	Noise pollution has detrimental impacts on the quality of life of residents, nearby companies and offices. In Vietnam, noise monitoring is still limited, the data is incomplete, thus it is necessary to investigate and examine real-life cases.
17. Distance to nearby city centers	This needs to be taken into account when mapping land values for satellite towns located near big cities. The degree of influence of big cities on satellite cities, according to the central theory, has been demonstrated in the land value model.
18. Distance to main roads	In an urban area, there are usually one or two main roads that have the highest profitability and trae potential, utility services, commercial centers. Having easy access to these places is big advantage.
19. Distance to graveyard	Lands that are close to graveyard will have lower transaction prices than those with same conditions but are further from graveyard, due to negative environmental and spiritual impacts on land price formation.
20. Distance to public lakes	Urban areas require a clean environment. Public lakes are the green lungs of the cities so lands that closer to lakes have higher prices than those that are further.
21. Terrain slope	Regional topography affects transportation activities, daily activities and economic activities. These activities are more difficult to mountainous residential areas, as the terrain is split with high altitudes.
II. Socio-economic factors	
22. Ability to provide clean water	This factor is vital to residents living in urban areas. Areas that have adequate clean water is better than those without clean water.
23. Static traffic density	Indicates the level of convenience of traveling, stable planning and traffic flow. Areas that have more lands for transportation will not be blocked.
24. Old towns that need to be conserved	Residential areas with long-standing traditional architecture values and ancient residential areas will be more valuable (e.g. Hoi An ancient town, Old quarters in Hanoi.
25. Population density (people per sq. km of a particular land area)	Areas with higher population density have higher demands of housing, low density areas have lower demands.
26. Rate of natural increase	Includes migration processes and the difference between the number of births and the number of deaths, directly affecting population density. Higher rate of natural increase leads to higher population density as well as higher land prices.
27. New urban areas	New urban areas are equipped with advancing infrastructure, facilities and higher educational level, thus they have higher values than the old residential areas.
28. Zoning	This has positive impacts on land values. Lands that are zoned properly will have prices that are entirely determined based on the land market and vice versa.
29. Limitations in construction	Investors, organizations and individuals will value non-agricultural lands in urban areas that are zoned and are not limited in terms of construction more than restricted areas with limited construction heights. Examples restricted areas include those that are within safety corridor of dykes or bridges.
30. Security control	High levels of safety and security control in residential areas increase land values and it is a prior condition in buying and selling. This is expressed in the "number of criminal cases prosecuted per year" index.
31. Total product per capita	Indicates incomes and region's well-being. It drives land prices to be proportional to the local average income.
32. Added value of a whole ward	Indicates the region's level of economic development and land demands, thus affecting land prices.
III. Environmental factors	
33. Air quality	A healthy environment will have positive impacts on real estate prices.
34. Water quality	Water shortage or contaminated water sources will have detrimental impacts on real estate prices.
35. Soil	This factor is used to represent weak, low, depressed areas and those with bad quality soil affecting daily lives and economic activities. Areas that are more susceptible to flooding will have negative impacts on production and business activities. Poor soil quality has influences on construction prices.

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Figure 2 below demonstrates a 7-step process of producing a land value map:

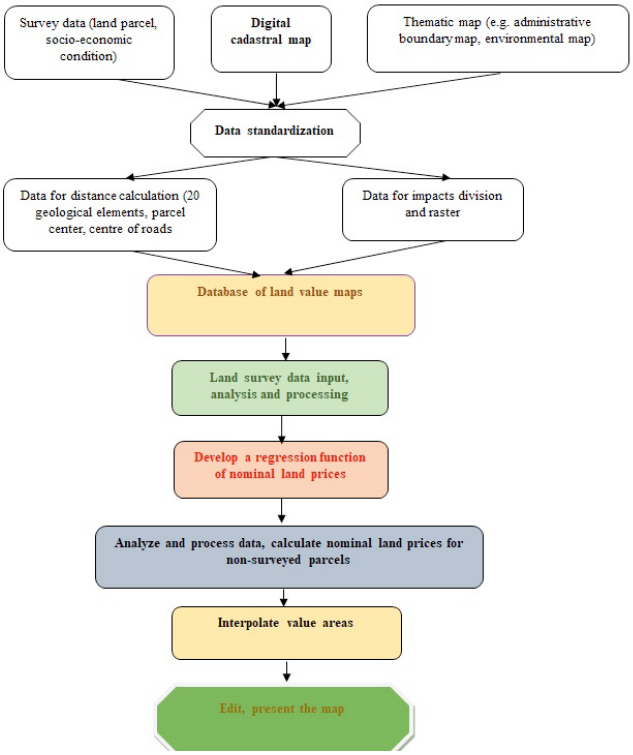

Figure 2. Steps in producing a land value map

Step 1: Preparation and field investigation

Preparation of documents, data for establishing land value areas for administrative units with cadastral maps:

Collecting thematic maps, socio-economic information. Maps, diagrams identifying areas and neighborhoods that need to be preserved; maps of red-line boundaries, construction boundaries, electrical safety corridors, dyke safety - Maps of assessing air quality and water quality; Soil maps; Administrative maps - Topographic map for interpolation of terrain slope in the form of raster within the administrative units to create a land value map - Other thematic maps for extracting background information - Statistical yearbook; socio-economic reports in the area.

Field investigation preparation. Determine investigation scope - Anticipating investigation locations requires sales, auction, compensation data - Provide training for technicians about requirements and methods of investigation - Prepare a survey form.

Investigate land parcels with transactions in the field. The investigation team needs to have a cadastral officer or a street leader - Areas without required samples need to have participation of real estate experts in order to estimate land prices of areas where land parcels do not have transactions.

Step 2. Data processing

Spatial data standardization. Clarify administrative boundaries, the scope of non-agricultural land in urban area - Standardize cadastral map data: combine cadastral map pieces according to administrative units; process and analyze boundaries of administrative units as well as internal data according to each administrative unit; divide cadastral map data into data layers of non-investigated land parcels to create a land value map; standardize information of socio-economic objects (20 objects) for distance calculation; standardize linear objects for distance calculation - Data that needs to be standardized for extracting information includes: ability to provide clean water, traffic density, conservation of historic towns, terrain slope raster, population density, rate of natural increase, new urban areas, urban planning areas, construction-limited areas, security, total product per capita, air, water and soil quality.

Data conversion. Having standardized data layers from above, use editing and data processing software to convert to database for the land value map.

Process surveyed land prices data. In this step, the user needs to eliminate individual factors, values of land assets. The land survey data is then standardized in Excel format (*.xls).

DOI: 10.6092/issn.2281-4485/9771

Step 3. Enter, process surveyed land parcels data.
- Create central points for surveyed land parcels (tamthuadieutra) with similar attribute information to that land parcel (DatPNN_Dtra).
- Enter the land survey data which was standardized in Excel format.
- Calculate the distance from land parcel centers to the nearest point-type socioeconomic objects.
- Export attribute information from attribute data layers (15 layers) in Dataset DL_Vungthuoctinh into the land parcel central point layer.
- Synthesize information of the surveyed land parcel, distance and other attribute information in a table.
- Export the synthesized information to calculate nominal land price regression function.

Step 4. Develop a nominal land price regression function.
- Having the surveyed land parcel information table in .xls format, a statistical software SPSS is used to calculate and determine the coefficients in the linear regression function.

Step 5: Interpolate land value zone. Having processed nominal land prices from the surveyed land prices and nominal land prices of unsurveyed land parcels calculated from the regression function, the Kriging interpolation tool in ArcGIS will be used to interpolate the land value zone.

Step 6: Edit, present the land value map. Use map editing and presenting tools to illustrate the thematic content, map elements and notes.

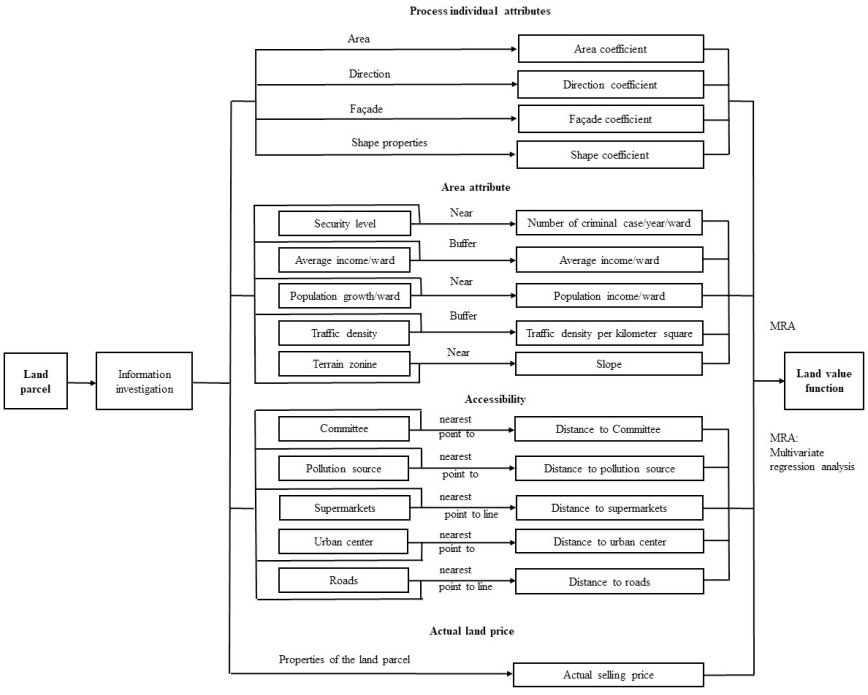

Figure 3. Establish a land value function by modelling impact factors

Application to non-agricultural land in Quang Ninh province

Quang Ninh is a mountainous, midland province located in the coastal and border areas of Northeast Vietnam with an area of 6,177.7 km^2 and a population of 1,224,600 people (2016). The topography of the province can be divided into three regions, mountainous, midland and coastal plains, sea and islands (Figure 4).

In order to create a land value map based on factors affecting land values, the required data includes: (1) spatial data (types of current land use maps, topographic maps, soil and air quality); (2) attribute data indicating socio-economic and environmental factors that are involved in land values. Details of data source are provided in Table 3.

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Figure 4. Quang Ninh province map (Source: Quang Ninh Department of Resources and Environment, 2019)

Table 3. *Data source details. (Source: Collective author, 2019)*

ID	Data group	Data layer	Data source
1	Spatial data	Current land use map	Quang Ninh Department of Resources and Environment
2		Topographic map	Quang Ninh Department of Resources and Environment
3		Soil map	Quang Ninh Department of Resources and Environment
4		Administrative map	Quang Ninh Department of Resources and Environment
5		Air quality map	Quang Ninh Department of Resources and Environment
6	Attribute data	Statistical yearbook	Quang Ninh Statistics Office
7		Socioeconomic reports	The People's Committee of Quang Ninh
8		Information on the ability to provide water, schools, parks, supermarkets etc.	Acquired from websites of Clean Water Supply company of Quang Ninh, Google Maps
9	Land price	Auction land price	Collect 1662 land price samples from auction results announced by Quang Ninh province.
10	Software	LVZMap, ArcGIS, Mapinfo, Microsation, Excel, SPSS, GPS	

The results from collecting and processing land transaction price information are demonstrated in Figures 5, 6, 7, 8, 9, 10.

Results of creating land value function. Use SPSS 20 to establish land value function with seventeen variables representing land formation factors:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X12 + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \varepsilon_i$$

where:

-Y_i is the dependent variable reflecting non-agricultural prices in pixel i

-X1, X2, X3, … X17 are the independent variables respectively reflect information about factors affecting land value (more details are explained in Table 4).

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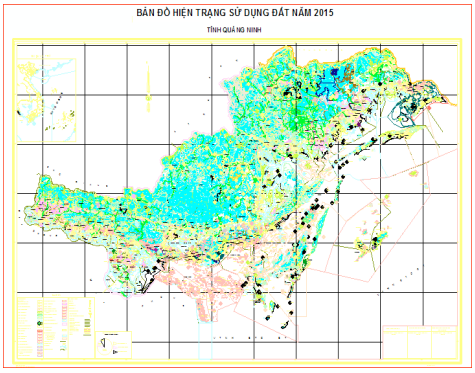

Figure 5. Land use map in Quang Ninh in 2015

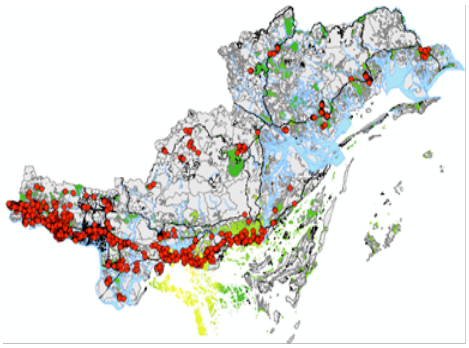

Figure 6. Transaction-based land price points in Quang Ninh

Figure 7. Unsurveyed non-agricultural land data in Quang Ninh

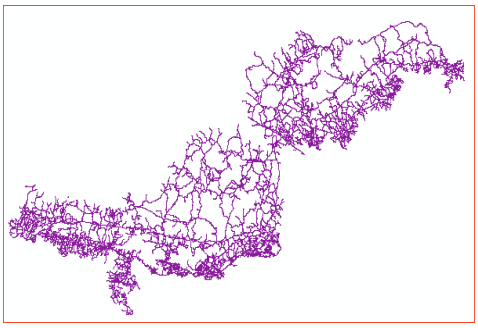

Figure 8. Traffic density in Quang Ninh

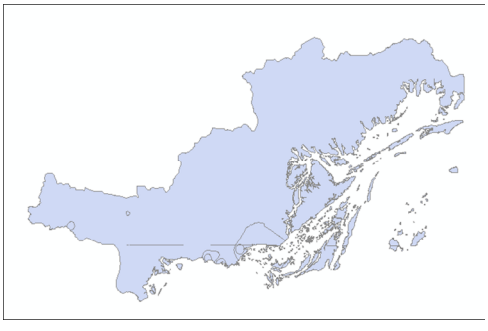

Figure 9. Air quality data in Quang Ninh

Figure 10. Soil quality in Quang Ninh

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Table 4. *Evaluating degrees of regression of the factors with nominal land prices.* (Source: Collective author, 2019)

X	Variables explanation	Results of correlation analysis, single regression	r^2
X_1	Distance from the land parcel to the nearest People's Committee	Y_{dn} =7786244,767* X_1 – 2066,258	0,162
X_2	Distance to urban centers types I, II and Special.	Y_{dn} = 9990564,726* X_2 – 169,994	0,159
X_3	Distance to urban centers types III, IV	Y_{dn} = 6504037,214* X_3 – 132,386	0,112
X_4	Distance to the police station	Y_{dn} = 7771008,910* X_4 – 533,561	0,166
X_5	Distance the nearest high school	Y_{dn} = 6589106,777* X_5 - 199,811	0,109
X_6	Distance to colleges, universities, provincial vocational schools	Y_{dn} = 5472296,854* X_6 – 22,440	0,014
X_7	Distance to health facilities at ward level and above	Y_{dn} = 6408229,525* X_7 – 239,968	0,055
X_8	Distance to markets	Y_{dn} = 6782580,869* X_8 – 500,725	0,172
X_9	Distance to shopping malls	Y_{dn} = 6247727,481* X_9 – 99,510	0,101
X_{10}	Distance to centers of culture, art, museums, theaters and sports	Y_{dn} = 7402469,294* X_{10} – 172,842	0,195
X_{11}	Distance to parks and outdoor play areas	Y_{dn} = 7240554,563* X_{11} – 95,843	0,106
X_{12}	Distance to bus station, railway station	Y_{dn} = 8136025,704* X_{12} – 300,531	0,101
X_{13}	Distance to tourist destination	Y_{dn} = 7607236,383* X_{13} – 703,979	0,152
X_{14}	Traffic density	Y_{dn} = -722738,875* X_{14} + 5169,047	0,192
X_{15}	Total product per capita	Y_{dn} = -7908161,300* X_{15} + 4612437,905	0,556
X_{16}	Ability to provide clean water	Y_{dn} = 1871923,671* X_{16} + 8195129,229	0,255
X_{17}	Soil quality	Y_{dn} = 1894465,072* X_{17} + 8311294,548	0,258

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.782[a]	.611	.607	4643711.387
a. Predictors: (Constant), X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}, X_{17}, X_{18}				

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.908E + 16	18	2.727E + 15	126.454	.000[b]
	Residual	3.120E + 16	1447	2.156E + 13		
	Total	8.029E + 16	1465			
a. Dependent Variable: Dongia b. Predictors: (Constant), X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}, X_{17}, X_{18}						

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Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-15123568.91	1103712.936		-13.702	.000
	X_1	-179.969	1067.441	-.035	-.169	.866
	X_2	12.971	18.598	.030	.697	.486
	X_3	-61.870	27.321	-.156	-2.265	.024
	X_4	-4.582	113.314	-.003	-.040	.968
	X_5	37.615	27.841	.062	1.351	.177
	X_6	-2.423	6.012	-.012	-.403	.687
	X_7	17.847	19.402	.024	.920	.358
	X_8	142.425	108.375	.102	1.314	.189
	X_9	1.928	9.578	.006	.201	.840
	X_{10}	148.285	45.139	.342	3.285	.001
	X_{11}	-17.647	14.063	-.060	-1.255	.210
	X_{12}	33.788	18.711	.036	1.806	.071
	X_{13}	-157.080	173.308	-.087	-.906	.365
	X_{14}	-.213	3.774	-.001	-.056	.955
	X_{15}	1712.178	284.104	.119	6.027	.000
	X_{16}	6114690.215	240406.590	.989	25.435	.000
	X_{17}	81178.853	965228.596	.005	.084	.933
	X_{18}	-2280220.578	1018097.928	-.139	-2.240	.025

The project could use the nominal land price function to calculate land parcels with unknown prices but with similar socioeconomic and natural information to land parcels with prices. A land value map in Quang Ninh is developed based on seventeen land price formation factors from the current land use map.

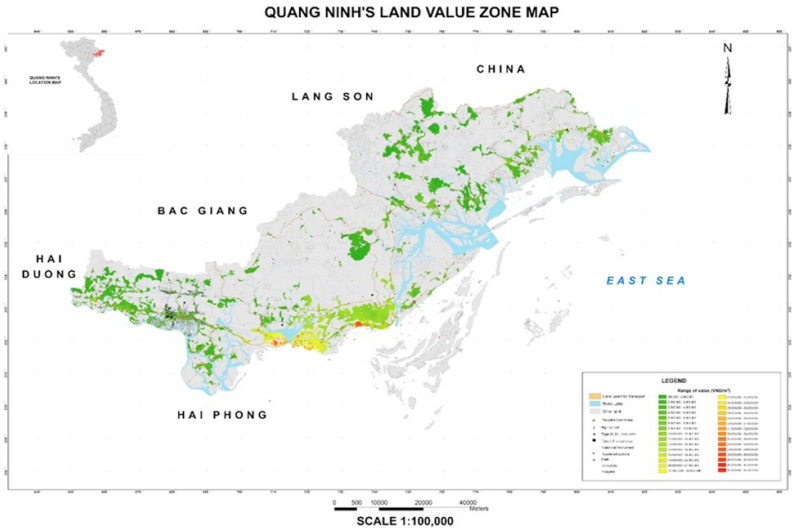

Figure 11. Land value areas map in Quang Ninh in 2017

DOI: 10.6092/issn.2281-4485/9771

Discussion and application

The Viet Nam Land Law states that "Lands belong to all the people, the State represents land owners, manages and grants land use rights to users according to regulations". Land users have a total of eleven rights, which are the basis for establishing land market relations such as the rights of transferring, donating, inheriting, mortgages, making financial contribution. Land users could include organizations, households, communities, individuals, foreign organizations, Vietnamese residing overseas according to law on nationality, national enterprises and those that are foreign-invested.

- There are two basic forms of land use rights market in Vietnam: (1) primary market, assigned and rented to land users by the State; (2) secondary market, includes market segments transferring land use rights, land rental market, market that contributes financially with land use rights. Transactions of land use rights is implemented on the trading floor. Land prices of primary market are assigned by the State according to the issued price lists and price brackets. Land prices of secondary market are the free market price.
- Land price reflects the relationship of supply-demand of land. It is also a tool used by the State to regulate land and real estate market, ensuring efficiency in land use. Therefore, the State needs to have an appropriate land pricing mechanism, reflecting the true value of land. Moreover, there are two types of land price: (1) land prices set by the State, used to calculate land use taxes, compensation when the State acquires the land or grants the land to enterprises, state agencies; (2) market land prices are those transferred by the parties based on the market mechanism. To ensure equality, it is necessary to regulate the added or diminished land value without investment from land users. Land taxes and fees need to be based on market's principles. However, in reality, price brackets are stable for a period of time while the minimum and maximum are still lower comparing to the market. Assigning and renting land do not show future values of land, thus land is not exploited and used effectively, leading to the above two types of land prices. Figure 11 reflects the current situation of land prices in Viet Nam.

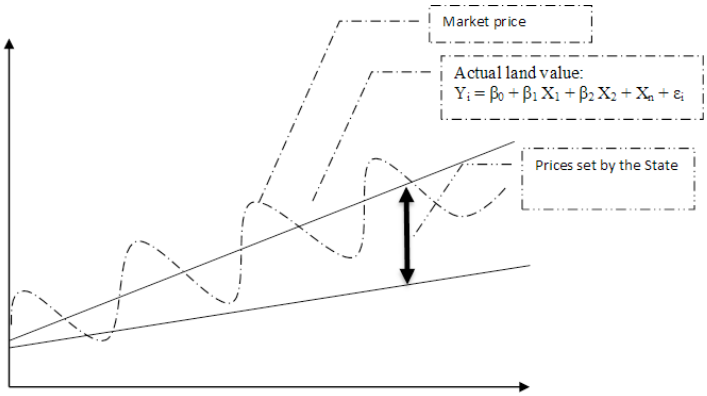

Figure 12. Illustration of market price, prices set by the State and land value in Vietnam Source: Collective author, 2019

Therefore, in order to reduce the gap between market price and prices set by the State as well as reflecting the actual land value, using a land value map will help us adjust the price list and price brackets.

Conclusions

This study has provided different viewpoints on land value and discussed methods of developing a land value map. Nevertheless, in the case of Viet Nam, determining factors affecting land value and creating land value zones are still limited. The study also identifies three groups of land value formation factors: distance, socioeconomic and environmental factors. With these three groups being concretized into seventeen factors, the study shows that determined factors are suitable, and that it is certainly feasible to create and build a land value map in Viet Nam.

In particular, comparing with the practical context of land management in Vietnam, it is significant to apply the method of developing land value zone maps based on the factors affecting the value of land. In order to solve the current shortcomings related to reducing the gap between the market price and the price issued by the State and at the same time ensuring fair. To do this, first of all need the official recognition of the Government

DOI: 10.6092/issn.2281-4485/9771

through legalizing the development, updating and use of land value zone maps in land management and administration.

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