

# Research Paper: Land Use Change in East Guilan and its Consequences



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## ABSTRACT

**Purpose:** In this article, land use change has been studied using satellite images of East Guilan (Lahijan, Siahkal, Ashrafieh and Langrood counties) in 1989, 2000 and 2015.

**Methods:** The information needed to identify the factors affecting land use change has been collected through visits, purposeful interviews in different parts of the area, and the study of written sources and archives of local offices. These data were analyzed using the "grounded theory" method in the Max Kiuda system.

**Results:** Findings show that land use changes in the region are related to various ecological, social, economic and political factors. Increased population pressure along with technological developments, land use policies, development plans, investments, land speculation and personal exploitation have each had some effect on land use change. State of nature has little dependence on tax revenues due to its natural resource revenues; as a result, it is not accountable. Lack of inclusive institutions promoting sustainable development, weakness of civil society, and inefficient production efficiency have caused the conditions for productive industrial development to not be provided. These issues and the economic instability resulting from the implementation of neoliberal policies have led to the commodification of land and housing, which has attracted capital.

**Conclusion:** One of the main consequences of such a situation is that, on the one hand, the destruction of natural resources, land erosion, environmental degradation and the occurrence of devastating floods have been increased, and on the other hand, unjustified class division and transfer of villagers from productive activities to unproductive businesses, such as security guards, villa caretakers and services of travel and transportation companies have endangered the social and food security of Iran.

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## 1. Introduction

**L**and use change is one of the challenges of rural settlements that have been the focus of rural research in recent years. In this process, the rotation of the rural economy and the beginning of consumerism have become the source of emerging developments in rural settlements (Halfacree, 1999; Gallent et al., 2003: 73). The developments of the global economy, land market, and technological and social developments have been influential in the structural changes and functioning of the rural economy (Plummer et al, 2017: 1). In this regard, urban-rural interventions and the physical structure of rural areas and land reduction and land use change around cities (Inwood & Sharp, 2012: 107) and new concepts in the form of land access power and land scarcity in rural areas have been proposed (Muraoka et al, 2018: 611).

Land use change is one of the issues in most countries of the world that is related to the development of technology and industrial and information economy. Although this type of change causes a lot of damage to the environment, it is economically and socially in the realm of development activities, which in any case will have negative environmental effects. But in low-growth countries, land use change originates from other sources, including rent and development policies, the consequences of which in addition to environmental hazards, occur in the form of social and economic problems. Therefore, in such countries, including Iran, lack of a proper tax system and the government's independence of citizens' taxes make the activity in the land and housing sector a suitable platform for large investments and tentative for speculative behavior, rent-seeking and corruption (Khandan et al., 2019: 242).

Rent refers to income earned effortlessly outside of the productive economic activity and by exercising political or economic power and influence. According to North et al., human behavior is shaped by institutions, but complex social interactions take place through organizations (government). Corruption is the abuse of public power for private benefit. In political corruption, political decision-makers use their position to maintain power, wealth and position, and in bureaucratic corruption, the administrative system gains personal benefit from its position (Momeni and Haji Norouzi, 2017: 221-252).

The root of corruption must also be sought in the rent-seeking of natural resource revenues. Undoubtedly, rent-seeking affects the political structure of a country.

Revenues from natural resources cause the tax systems of these countries to be weak, thus undermining accountability, which is a key element of democracy. The institutional factors that result from this situation cause rent-seeking countries to distance themselves from the democratic system. Since there is a reasonable and significant negative relationship between democracy and corruption, moving away from democracy provides the basis for intensifying corruption in these countries (Momeni and Haji Norouzi, 2017: 221-252).

## 2. Literature Review

In pre-modern governments, rents were received by force, but in modern times, rent-seeking bureaucracies make this kind of wealth transfer peacefully and bureaucratically. In developed societies, rental opportunities have been largely eliminated by streamlining regulation and establishing open access social order. There is a relationship between social order and the way rent is created, and historically, social order has had stages, including:

A. The first social order in hunting societies;

B. The order of limited access, dating back ten thousand years ago, which restrains violence through the intrusion of the political system into economic interests by the creation of rents. The limited access order creates rents, privileges, and discrimination between superiors (dominant coalition) and non-superiors, and is an obstacle to long-term economic prosperity and development.

C. The open access order has been prevalent in some parts of the world for three centuries, maintaining social order through political and economic competition (rather than creating rents like the state of nature). In this way, the government monopolizes potential violence and other organizations are not allowed to use violence. Open access remains sustainable in communities where economic, political, religious and educational activities are open to all citizens (as long as they meet the necessary impersonal standards). This order exists in a few countries in the world, all of which are developed.

The political and economic structure of the limited access order is the state of nature. In the state of nature, politics and economics are intertwined, and political, social, and economic access is limited to creating economic rents for superiors, and these rents create an obligation for superiors to maintain the existing social order. The more valuable these rents are, the more stable society will be. Hence, the superiors support the government, and if their rights are violated, they force the govern-

ment to respect their rights by threatening to leave the coalition. The government also has to respect the rights of superiors in order to survive. In such a government, each member of the superiors has exclusive control over certain resources or activities, and due to the restrictions on entry and access imposed by the superiors, they receive rent from their privileges. In such governments, the expansion of specialization and division of labor is limited because it requires an increase in the degree of entry, openness and access to the economic system, which leads to a reduction in the rents of superiors and is a threat to their status. In an environment with high corruption, the investor is forced to pay bribes and royalties to various institutions in the government in order to operate and continue its activities (North, Wallis, Wingast, 2006: 92-151).

There is also a logical relationship between the cycles of capital accumulation and the influx of capital to buy and seize land. In the conditions of the stages of accumulation cycles, certain groups of economically and politically influential classes restrain the allocation of scarce production resources in their interests (Borhani et al., 2017: 7).

Yan et al. (2021) in a study entitled "Assessing the Impact of Rural Land Use Planning: A Case Study of Kyuwangfen Village in Beijing" examined the situation of villages versus cities and believed that there are many problems in rural areas, which are: Destruction of cultivated areas, degradation of villages and environmental pollution. One of the main reasons for these problems is considered to be incorrect land use planning at the village level. In fact, it is believed that changes in land use will lead to a number of potential risks in the future. Accordingly, in this study, instead of minimizing the risks in planning optimization, maximizing the benefits has been considered. For this purpose, they used the term 'green development' to continue the research work and believed that this model leads to balance, efficiency, coordination and stability.

Huang et al. (2020) in an article entitled "Rural Rehabilitation in China: Using Land Use Optimization on Earth", believe that in the process of globalization and rapid urbanization, most of the world's villages are facing the challenge of transformation and revitalization. In this article, they focus on land use optimization and intend to reveal the trend of rural development in the theory of location from a micro perspective. A case study on the village of Yuanqivanesh in China showed that human-land relations can be coordinated in the process of building a place, which is the foundation of a

harmonious neighborhood to implement land use policy. Location ultimately leads to the optimal allocation of rural resources. Finally, they suggested that incentive policies such as surrogate subsidies with rewards and rural planning should be adopted to help villagers revitalize the villages after production.

Accumulation cycles have dialectical relations with each other (Harvey, 2008: 25) and need the commodification of nature, including the land, in order to earn profit and reinvest (Maljoo, 2014). For this reason, in countries against capitalism such as Iran, where it is not possible to expand industrial investment and industry is lagged behind (Ashraf, 1980), resources flow to the purchase and occupation of land and housing, which have become a commodity. This is while land and natural resources are different from capital and labor (two factors of the accumulation process). Labor is the active effort of man, capital is the result of the accumulation of past efforts of labor, capital is man-made, even in the form of commodities. But natural resources are not the fruit of human effort, but a natural gift. Even if it is said that the quality of land and the value of places are formed under the influence of human efforts, it means that they are somehow the fruits of human effort, which is true, but still, land and location are considered as long life conditions of production and supply of much of them is not the result of capitalism. Therefore, land is different from other goods and it is not a commodity (Matthew, 2001: 103-108)

In Iran, about 10,000 to 20,000 hectares of agricultural land are destroyed annually. In the last four decades, the area of the country's forests has decreased from 18 million hectares to 12 million hectares and 350 square meters of pasture land and forests are destroyed every second (Taleshi et al., 2019: 96).

According to Reza Aflatoni (2020), Director of Land Affairs of Qazvin Province, from 1995 to 2015, i.e. at the same time with the implementation of the Law on Agricultural Land Protection, about 1800 hectares of agricultural land has received a Note 1 permit and has become non-agricultural land. During this period, about 1800 hectares of agricultural land have undergone land use change illegally. When the land use changes from agricultural to residential-commercial, its value increases up to 20 times (Mehr News Agency, Thursday, April 2, 2020). According to the census data in the last 20 years, the rural population in Iran has decreased by 16.5 percent, but the number of residential units has increased by 10 percent (Amar, 2013A: 86).

According to the research of Darban Astaneh et al. (2016: 128-143), the land exchange by intermediaries and the profit from investment in housing and land have been important factors in the destruction of agricultural land in northern Iran. In Guilan province, during the period of 23 years from 1988 to 2011, about 91140 hectares have been decreased from agricultural lands; that is, in this period, the area of agricultural lands in Iran has decreased by 26.4% (Amar, 2013A: 87).

The priority of the economic role of Guilan province has been announced by those in charge of planning, agriculture, tourism and industry (Moj News Agency, quoted by Mohammad Ahmadi, Deputy Governor of Economic Affairs and Resources Development of Guilan Province, April 24, 2020). In this regard, the Tehran-Rasht railway has been activated and according to a local study in different cities, Guilan province has received more attention from the immigrant population. Hence, irrational change of agricultural lands will have dangerous economic, social and environmental consequences. Destruction of lands in mountainous areas will cause unexpected events and floods, such as the tragic floods of 1998 and

2012 in the mountainous area of Masouleh. Therefore, it is necessary for the government and civil society to seriously consider land use change of Guilan province. Accordingly, the present study first analyzes the trend of land use change in the east of Guilan province. Then, the effective factors in the process of destruction and land use change are studied, in the hope that the results will be used by authorities for the rational protection of land use and the planning of the environment and natural resources.

### 3. Methodology

The present research, from an epistemological point of view, is a pragmatic research (Crosswell, 2012: 39). The study area is the four cities of East Guilan (Ashrafieh, Siahkal, Lahijan and Langrood) with an area of 2260 square kilometers. To collect the required data to recognize changes in land use levels, satellite images of (1989-TM), (2000-ETM) and (2015-landsat 8) have been used to monitor land cover classes in three time periods. Table 1 shows the image specifications.

**Table 1.** Image specifications and image processing to study land use and land cover (LULC) change over a period of 26 years

Stages	Description of activities
1 Land cover classes	Changes in paddy, garden, urban (residential), water resources, forest and uncovered cover classes were examined.
2 Image selection	In selecting the images, an effort was made to select the months in which the cloud cover is minimal and the vegetation is perfect. 1. Image of 1989 (2/7/1989), Landsat Satellite, TM sensor 2. Image of 2000 (30/6/2000), Landsat satellite, ETM sensor 3. Image of 2015 (16/6/2015), Landsat 8 Satellite
3 Pre-processing and bands' combination	Envi5 software was used for image preprocessing including geometric corrections and radio metrics. Bands 1, 2, 3, 4, 5 and 7 were combined in Erdas software to create a false-color image in order to process changes in land cover classes.
4 Image classification	Images were classified in Recognition Developer software using object-oriented technique. The object-oriented technique included segmentation, training design, and area classification. The training points for the present were captured through the field methods using GPS in six spectra, and the aerial photographs of 1989 and 2000 were used to obtain the training points of the previous years.
5 Accuracy of classified images	Using the kappa coefficient, the image classification accuracy in 2015 was 95.74%. The classification accuracy of 2000 was 86.52% and the classification accuracy of the 1989 image was 36.89%.
6 Specifications of the study area	- The study area has an area of 2260 square kilometers and 744 rural settlements. - Existence of topographic diversity including coastal, plain, summer, foothill and mountainous areas in the form of a problem-solving environment - In recent years, there have been many sporadic changes in the use of tea gardens. Most of the tea gardens are in the selected area.
7 Periods of the study of the trend of changes	The time span of the research for analyzing and monitoring the land cover pattern was 26 years, from 1987-2015.

The information needed to identify the factors affecting land use change were obtained through field visits and targeted interviews in different parts of the area, as well as the review of written sources and archives of local offices. After a local interview with 76 people who had the desired eligibility (aware of the factors of land use change), information saturation was achieved, which resulted in understanding and extracting propositions effective in land use change. These data were analyzed using the "grounded theory" method. Grounded theory is an inductive and exploratory research method that allows researchers in various subject areas to formulate their own theory instead of relying on existing theories. This method, in the simplest possible form, is the process of constructing a codified theory through data collection and inductive analysis (Allan, 2003: 4).

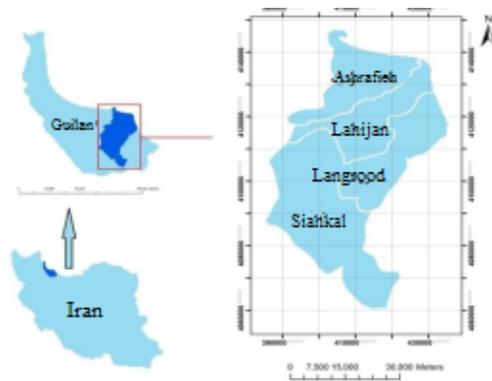


Figure 1. Study area



The study area is located between the coordinates  $X_{min} = 381911$ ,  $Y_{min} = 4059762$  and  $X_{max} = 435997$ ,  $Y_{max} = 4148165$  in the UTM global imaging system in Zone 39 N (Figure 1).

This 226,000-hectare area has 744 villages as well as coastal, plain, foothill, forested-mountainous and high summer features. According to the statistics of 2012 of the General Department of Natural Resources of Guilan province, the area of forest areas of Guilan is 564712 hectares and the area of rangelands of the province is 244986 hectares. Also, according to the agricultural census of 2003, Guilan province has 253402 hectares of land under cultivation of crops, orchards and shinnery, of which 198456 hectares are allocated to agricultural lands and 54946 hectares to gardens and shinnery. The share of agricultural lands in the study area was 48,292 hectares of arable lands and 14,377 hectares of garden lands. Accordingly, the study area includes 24.33% of agricultural lands and 26.16% of garden lands in Guilan province.

Most of the garden lands in the area are dedicated to tea cultivation, a significant part of which has been severely damaged or is subject to destruction and conversion for construction.

At present, the role of changing the economic function of the village from agriculture to tourism, rural guide project and modeling of urban lifestyle is undeniable in the remodeling of the villages. The study area is faced with phenomena such as unlimited penetration of urban land use coverage in the field of other land covers, the establishment of destructive environmental activities, fragmentation and abandoning of agricultural land. Abandoned land is very prone to sale and change of use. Favorable climatic features have increased speculation in land transactions. For example, increasing demand for villas has added to the value of land, specially landscaped, coastal, and sloping lands with natural endowments. Recently, villa construction on agricultural farms has also gained significant fans. As a result, land sales and illegal land use change have become very common as unpleasant events that together lead the region to instability. Certainly, with the continuation of the current trend, the unique natural endowments and the existential reason for the tendency to own land will be destroyed in the not too distant future, and the tourism industry will also face a serious challenge. Even some development projects, such as the guide project, have created a platform for legal changes in agricultural uses due to poor planning and implementation, with the aim of forming a cohesive rural fabric and providing optimal services. In the current situation, the agricultural economy is not able to compete with the land speculation and there is not enough supervision over the protection of agricultural land and natural resources. As a result, the quality and limited resources of the land are being wasted day by day due to anti-ecological measures.

In the study area, the main structure of the existing agricultural cover remains as a heritage of the past and in a traditional form, and its area decreases every year. Only parts of paddy lands have been organized in the agricultural mechanization equipment plan. An issue that deserves much consideration is the chaos and lack of a coherent planning program to prevent sporadic changes in agricultural cover. Aside from the existence of conservation laws for agricultural land, there are always ways and means to change and apply personal tastes. There is no limit to the scope for change. The occurrence of construction violations in agricultural lands and natural areas is also abundantly visible. Lack of employment has increased migration to the cities, which has affected land use change and the sale of agricultural land. Given that

the study area is the hub of strategic crops such as rice, tea, peanuts, legumes and citrus in Iran, unsustainable land use, ecosystem destruction and uneconomic exploitation in the agricultural sector will occur.

#### 4. Findings

##### A. Land use change

Changes in the area of the six land cover classes between 1989 and 2000 and between 2000 and 2015 were obtained using a cross-tabulation matrix. The first period of monitoring of cover changes was since 1989 with the beginning of the first development plan after the Islamic

Revolution, the end of the imposed war and the beginning of the construction season until 2000, the beginning of the recession of the tea industry and major developments in land use. The second period was from 2000 to 2015. Table 2 shows the ratio of the area of change of each class to the total area.

Table 3 shows the ratio of the area of change of each land cover class to the total area between 2000 and 2015.

Figure 3 shows the changes in the land cover classes of the study area in 1989, 2000, and 2015.

Table 4 and Figure 4 show land use changes in different years based on satellite images extracted from Figure 3.

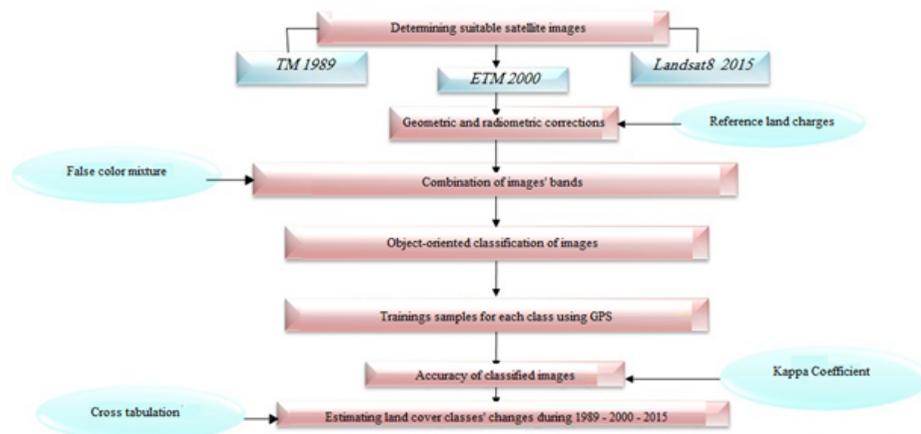


Figure 2. Stages of the study of images



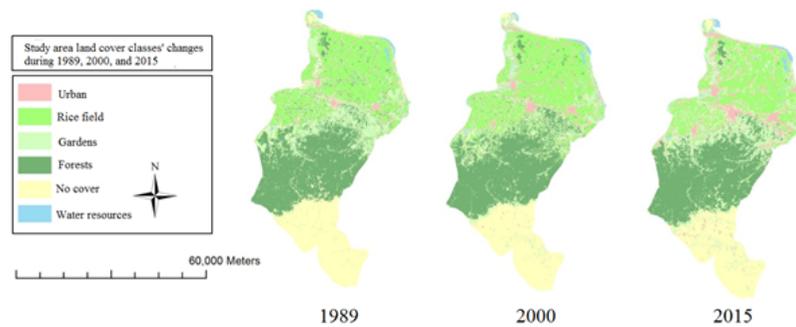
Table 2. Proportional cross-tabulation of 1989 image classes (columns) versus 2000 image classes (rows) (%)

Cross-tabulation	Around	Urban	Rice field	Gardens	Forests	No cover	Water	Total
Around	0.4878	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4878
Urban	0.0000	0.0111	0.0042	0.0084	0.0012	0.0033	0.0005	0.0287
Rice field	0.0000	0.0029	0.1046	0.0183	0.0118	0.0015	0.0015	0.1407
Gardens	0.0000	0.0037	0.0116	0.0385	0.0150	0.0118	0.0012	0.0818
Forests	0.0000	0.0004	0.0037	0.0184	0.1304	0.0022	0.0001	0.1552
No cover	0.0000	0.0009	0.0009	0.0040	0.0017	0.0886	0.0014	0.0975
Water	0.0000	0.0003	0.0015	0.0010	0.0002	0.0016	0.0038	0.0084
Total	0.4878	0.0193	0.1264	0.0887	0.1602	0.1091	0.0085	1.0000
Overall kappa	0.80							



**Table 3.** Proportional cross-tabulation of 2000 image classes (columns) versus 2015 image classes (rows) (%)

Cross-tabulation	Around	Urban	Rice field	Gardens	Forests	No cover	Water	Total
Around	0.4876	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.4878
Urban	0.0000	0.0183	0.0092	0.0115	0.0014	0.0035	0.0010	0.0449
Rice field	0.0000	0.0025	0.0910	0.0085	0.0021	0.0006	0.0010	0.1058
Gardens	0.0001	0.0066	0.0329	0.0418	0.0204	0.0094	0.0019	0.1130
Forests	0.0000	0.0004	0.0042	0.0144	0.1300	0.0015	0.0000	0.1505
No cover	0.0001	0.0005	0.0016	0.0041	0.0012	0.0815	0.0006	0.0896
Water	0.0000	0.0004	0.0018	0.0013	0.0001	0.0009	0.0038	0.0083
Total	0.4878	0.0287	0.1407	0.0818	0.1552	0.0975	0.0084	1.0000
Overall kappa 0.79								

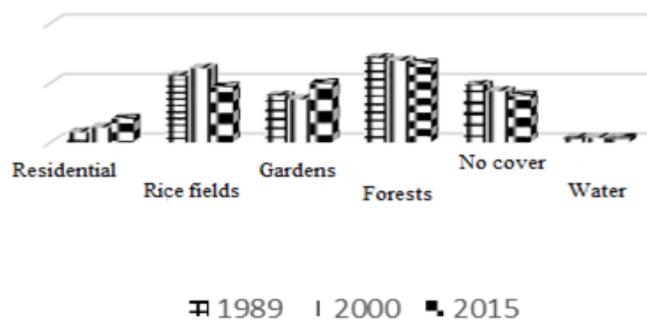


**Figure 3.** Land cover classes changes during 1989, 2000, and 2015



**Table 4.** Area of different land uses in hectare in different years in the study area

Land use	1989	2000	2015	% of 26-year changes
1 Residential	8511.97	12653.23	19818.17	132.83+
2 Rice field	55794.75	62071.09	46665.39	16.36-
3 Gardens	39121.45	36077.46	49842.26	27.40+
4 Forests	70671.84	68481.45	66416.95	6.02-
5 No cover	48155.05	43035.45	39500.69	17.97-
6 Water	3759.82	3686.88	3643.43	3.09-



**Figure 4.** Area of different land uses in hectare in different years in the study area



Based on the obtained data:

- The level of rice fields in the first period (1989-2000) has increased significantly because in this period groves and even water intakes of natural resources became rice fields on a large scale throughout the province (Afrahkhteh, 1996: 51-86), due to the implementation of paragraph A, the bill of transfer and rehabilitation of lands approved by the Revolutionary Council on September 16, 1979 (Ashraf, 1982: 50-56) and the increase in rice prices. After that, due to the implementation of the policy of structural adjustment and excessive import of agricultural goods, rice cultivation was not economically viable and retreated in favor of residential construction, so that during a period of 26 years, 16.36% of the area of arable land has decreased and this trend continues.

- Changes in the level of garden lands of the first period (1989-2000) experience a slight decrease, which can be related to the conversion of tea and mulberry garden lands into rice fields or residential areas. After that, i.e. the period 2000-present, the tea and mulberry orchards have been turned into construction levels as far as possible or left unused. If the statistics extracted from the satellite image show a limited increase in garden levels, it is no doubt related to abandoned gardens and weed growth, and also, levels related to natural resources, which in the first stage seem to be enclosed as a garden to turn it into a construction space.

- Forest areas and lands with no cover (high mountainous pastures) have been continuously reduced during a period of 26 years (1989-2000). The decrease in forest areas was 6.02%.

The decrease in areas with no cover was 17.97%. This type of land, both coastal and plain, especially in the foothill areas as well as areas without tree cover of high mountains has turned into residential use.

- Residential land has increased significantly by 132.83% during the last 26 years and has expanded to the detriment of all levels of agriculture, horticulture, forest and uncovered areas.

In general, these types of spaces can be divided into several groups:

First, the expansion of urban and rural centers: the number of cities in Guilan province has increased from 31 urban centers in 1986 to 52 urban centers in 2016. In the study area, the number of urban centers has increased from 4 cities to 11 cities during the mentioned period.

In addition to increasing the number of cities, the size of cities and villages with more than 20 households has also increased and the surrounding spaces including agricultural, garden and or natural sources have been swallowed.

Second, tourism spaces have expanded to the detriment of the agricultural, garden, and natural resources in most of the pleasant and accessible routes, tourist spaces, and hospitable construction, hotels, restaurants, and hookah centers.

Third, the construction of villas and second houses is a very common phenomenon in Guilan province, which has worked to the detriment of the agricultural, garden and natural resources.

Fourth is the occupation of land and the construction of buildings by speculators, which has grown greatly in the last two decades and has intensified with the saturation of Mazandaran province and the opening of the Tehran-Rasht railway.

There is another change in the land use of Guilan, which is less important compared to these changes, but it is important from the economic and livelihood point of view, and that is that traditional mulberry crops for silkworm breeding and tea cultivation are relatively obsolete. In contrast, crops such as peanuts in Ashrafieh, kiwi and citrus cultivation are more or less common in some areas.

### Factors affecting the evolution of land use

Table 5 shows the analysis of research data based on grounded theory, using Max Kiuda software (Appendix 1).

Table 5. Results of data analysis based on the grounded theory in the Max Kiuda system

Macro categories	Categories	Concepts	Propositions			
State of nature policy-making	Traditional bureaucracy	Bureaucratic rent	There is no strong will in the government to prevent illegal constructions.			
			Land use change in the suburbs is done with the intervention of high officials.			
			It is possible to prevent land use change in a quasi-legal way.			
			Laws are easily violated in land use change.			
			Changing the use of illegal lands is not a problem for influential people.			
			Land is assigned to certain individuals by the Natural Resources Organization and other bodies.			
			Land use change in suburban areas is done by factors of power and wealth.			
			First, they receive land as a "housing cooperative" from the government, then everyone sells their share in the open market.			
			Neoclassical economic policy	Withdrawal from governing duties	Self-sufficiency of villages and municipalities	Municipalities issue land use change permits without complying with the law.
						Villages and village councils act as intermediaries in the sale of land.
The tasks of the responsible institutions are parallel to each other.						
Agricultural land use cannot compete with residential, commercial, and service uses.						
Deregulation and weakening of productive activity	Competition of speculation with traditional production	If you sell agricultural land and save the money in the bank, the profit is far greater than the agricultural income without doing the work.				
		Traditional agricultural production has been eliminated due to economic inefficiency.				
		Traditional products (tea and berries for silkworm breeding) have been eliminated due to the import of similar goods.				
		If you turn a farm into a coffee shop and a bean shop, you will have both a comfortable body and a higher income.				
The commodification of land and housing	Elimination of agricultural activities from the village	They have brought transportation functions to the village.				
		They have brought warehousing functions to the village.				
		They have brought car repair and service functions to the village.				
	Land and housing speculation	The establishment of various factories has caused the surrounding smallholders to sell their agricultural land.				
		The prosperous group has turned agricultural and barren fields into villas.				
		If you save the money in the bank, it loses its value day by day, but if you buy land, the value of the money will be preserved.				
Deprivation of ownership of the poor	Deprivation of ownership of the poor	In the past, we used to trade in Nasro Khosrow Bazaar, but now we can no longer afford it. We want to buy and sell in halal ways.				
		If we sell medicine, they say you are a smuggler. We don't have a job, what should we do if we don't buy and sell land?				
Private ownership of urban lands and the high cost of land and housing have limited the settlement of the poor in cities.	Private ownership of urban lands and the high cost of land and housing have limited the settlement of the poor in cities.	Private ownership of urban lands and the high cost of land and housing have limited the settlement of the poor in cities.				

According to the data in Table 5, two major categories have been effective in land use change:

First, state of nature policy:

One of the policies of the state of nature is the domination of the traditional bureaucracy. In this type of bureaucracy, economic rents are provided to the upper classes. They have exclusive control over specific resources or activities and earn rent from their privileges. In such governments, the expansion of specialization and the division of labor is limited, the efficiency and productivity of production is very low, and the investor, in an environment with high corruption, has to pay different institutions of the government to expedite the work in order to be able to continue his activities. In the traditional bureaucracy, the principles of "Weber" bureaucracy, including the impersonalization of relations, observance of laws, and efficiency (Weber, 1995: 336-340) have no place, and the dominance of personal relations over affairs causes chaos in the implementation of land laws and land use changes. The statistics of the 2014 vision document show that the favoritism index, which is the personalization of relations, is high in Iran and Iran was ranked 46th out of 147 countries in the world in 2017. It is in such a system that the superiors of society can circumvent any law, including land laws, protection of natural resources, and reasonable use of land.

Second, the implementation of neoclassical economic policies:

One of the features of neoclassical economics is the withdrawal of the state from its governing duties. After the end of the war imposed on the Iranian people, the policy of Washington consensus overcame the country's decision-making system (Niko Nesbati, 2016: 195-179). In this regard, the Islamic Consultative Assembly on July 5, 1998, approved a single article, according to which, the Ministry of Interior is allowed to establish an organization called Dehyari, meaning rural development, according to the location of the place at the request of the residents in order to manage the affairs of villages (Parliamentary Research Center, Approved by the Islamic Consultative Assembly on 5/7/1998).

According to Article 2 of the General Statute of the Organization of Rural Development, it is a non-governmental public institution, has an independent legal personality, and is self-governing; that is, the cost of Dehyari administration became dependent on the purchase and sale of land and receiving its tolls. As a result, the implementation of this article, in some cases, caused

Dehyar, to become an intermediary in the sale of agricultural land without consulting the Housing Foundation and a consultant to obtain a construction permit for the buyer to provide the income required by Dehyari.

Sometimes, the villagers have been forced to give their land to influential people at a low price in order to use their influence to receive services, such as rural roads and electricity (Afrakhteh, 2014: 15-29).

Another feature of neoclassical economics is deregulation and the weakening of productive activity. As a result of the implementation of this policy and the import of agricultural products produced by international companies, traditional agriculture with hard work and low productivity, cannot compete with service, commercial and residential uses and retreats in their favor. Especially before the implementation of these regulations, farmers received their input needs such as fertilizers, pesticides and animal medicines at a cooperative price and in the form of loans from rural cooperatives (Azkia, 2008: 48) but after the implementation of these regulations, farmers had to purchase all inputs from the free market in cash. As a result, rural smallholders have put agricultural and horticultural lands up for sale to meet their immediate needs and daily livelihoods. In some cases, they have been able to engage in small business activities, such as setting up a hookah center and small grocery stores or have been involved in municipal capital services, travel agencies, or real estate agencies. However, due to the sharp inflation of land prices, they will never be able to buy back the land they lost.

Another feature of neoclassical economics is the commodification of land and housing. As a result of the implementation of this policy, first, agricultural and productive rural activities have been eliminated in the context of a market economy and in conditions of incomplete competition (Fujita and Thisse, 2009). The rural population as the assistant to the urban capitalists has transferred the necessary urban activities to the rural environment, and as a result, the village has become a consumption market for urban and imported goods. The rural population cannot keep local chickens and their agricultural and livestock production is very limited due to the expansion of second homes of urban people (Zaheri et al., 2013: 123-144) or the expansion of numerous shops supplying consumer goods. Accordingly, they themselves have become consumers of urban and imported goods, causing numerous social, economic and environmental problems for the villages (Khoshnood et al., 2017: 13).

Second, the land and housing speculation has become widespread. This policy has led to the rule of the traditional bureaucracy, in which the superiors remove productive activity and leave lands to residential use in various ways. One of these methods was to add an addendum to the "Law on Preservation of the Use of Agricultural Lands and Gardens", which was approved by the Islamic Consultative Assembly in 1995. In 2006, the addendum was added and Note 5 of Article 1 of this law stated that "Lands within the legal boundaries of villages with an approved guide plan are subject to the guidelines of this plan and are exempt from all the provisions of this law [the Land Use Preservation Law]." Thus, the decision and supervision of agricultural lands in rural areas of the guide project was entrusted to the Housing Foundation of the Islamic Revolution and Dehyar. This legal remark in Guilan province, where housing is scattered and garden houses are scattered throughout the village, has caused a large area of agricultural land in addition to the physical texture of the village to be within the scope of the guide plan. As a result, possible widespread violations of unauthorized change of use and construction in this valuable area in terms of agriculture and forestry became easily possible. Extensive land use changes and unauthorized constructions have been made using this note and by bringing more agricultural lands and natural resources into the scope of the guide plan, after removing it from the supervision of agricultural Jihad (Azimi, 2019).

The ruling coalition, using enacted laws, has expanded its rent-seeking activities, an example of which is the abuse of "paragraph D" of Article 194 of the Fifth Development Plan Law. Article 12 of the executive regulations of this article states that "Individuals living in cities who apply for return and permanent residence in villages outside the city limits (reverse migration), with the recognition and approval of the village head [Dehyar] and by observing the relevant rules and regulations can enjoy the support of the subject of this regulation and receive facilities for construction or strengthening of rural housing and land" (Executive Regulations of Article 194 of the Law on the Fifth Five-Year Development Plan approved by the Cabinet on Sunday, May 5, 2013). This regulation has given the excuse to influential people that have seized many natural resource lands as "tourist-owner", an example of which can be seen in the tourist routes of East Guilan, which have destroyed the pristine area of Deilman, natural, agricultural lands and gardens due to the invasion of so-called tourism activities (Amar, 2013: 171-192).

Third, the commodification of land and housing and the privatization of urban space have driven the lower classes out of urban space. Based on the statistical data of the Central Bank in the period from 1959 to 2012, the added value created in the industrial sector of the country has increased 60 times, the same figure for the agricultural sector has increased 70 times, for GDP without oil 75 times, for buildings and real estate 130 times, and for services focused on money trade has increased 200 times (Momeni, 2017: 49). As a result, the lower strata of society have been pushed to the outskirts of the city to settle on non-residential lands, which in Guilan province were mostly agricultural and horticultural lands, which has led to a change in land use.

## 5. Discussion

Today, discussions and concerns about land use change have received serious attention. In such a situation, land use has become an important issue of political analysis. Land use is an example of human impact on the environment. Land use has special economic characteristics in terms of its nature, for example, human activities such as production, consumption, investment, recreation, etc. require the use of geographical space. Economic activities are manifested in various forms such as housing construction, providing facilities, infrastructure construction, agricultural lands and green space in geographical space. Formed uses are raised as an issue when they have geographical differences in terms of compatibility and desirability.

Economic life does not pass through abstraction but is the product of human actions (Clawall, 1994: 146-373). According to Adam Smith, economics is defined as a system of collective life production and cannot be separated from social, economic and political processes (Afrakhteh, 2018: 11). Analysis of economic change will not go anywhere without considering political and social trends (Roderick, 2017).

Land use change and land cover change over three periods of time have shown that these changes have been related to the ecological system, social conditions and economic policies. Increasing population pressure, along with technological developments, land use policy, development plans, investments, land speculation, and personal exploitation, have each affected land use change in some way. Due to the fact that the changes are varied in terms of space, time and the prevailing views of the process, it is faced with scattering micro and macro spot changes in different parts of the study area, which cannot be mastered without efficient tools.

The state of nature has little dependence on tax revenues due to its natural resource revenues. As a result, it is not accountable. These conditions, along with the characteristics of underdeveloped countries and authoritarian governments, do not have inclusive institutions that promote sustainable development, where civil society is nothing or very weak, so production and productivity are negligible. Also, there is no growth and the necessary conditions for productive industrial development are not provided.

These issues and the economic instability resulting from the implementation of neoliberal policies are leading to the commodification of land and housing, which is attracting capital.

In most countries of the world, and even in countries governed by a free market order, land is not freely governed by the rule of the market by means of laws. But in the circumstances mentioned, corruption and rent-seeking along with neoliberal policies have fueled the land speculation and no one can deal with it.

One of the main consequences of such a situation is that on the one hand, the destruction of natural resources leads to floods, land erosion and environmental degradation, and on the other hand, unjustified class divisions, the transfer of villagers from the productive sector to guarding, villa care and travel and transportation services endanger the social and food security of the country, both of which require independent research and scientific solutions. Otherwise, the irreparable consequences of this situation will sooner or later cause major problems for society.

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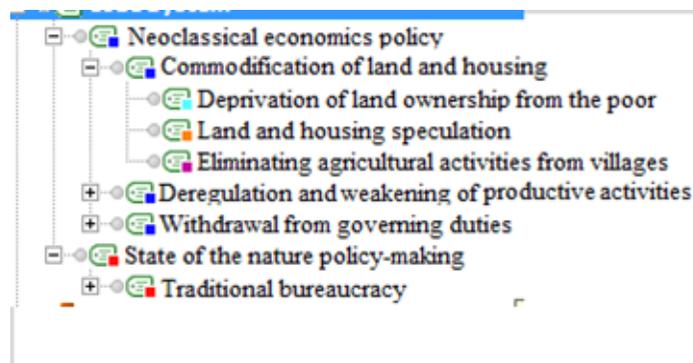
### Conflict of Interest

The authors declared no conflicts of interest.

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