ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

Potential Land-Use Conflicts at the County Level in Arid Oases Based on the LUCIS Model

Li Bincai[1], Wu Zhaopeng[1,2,*], Lv Siyu[1]

[1]College of Geography and Tourism, Xinjiang Normal University, Urumqi, 830054, China
[2]Lake Environment and Resources Laboratory of Arid Region of Xinjiang, Urumqi, 830054, China
**Corresponding author*

Abstract: *In this paper, Jinghe County, one of the key core areas of the Silk Road Economic Belt and the Northern Slope of Tianshan Mountains Economic Belt, was selected as a case study. The improved land-use conflict identification strategy (LUCIS) model was adopted to define the multi-appropriate land in the study area into three land use types as follows: agricultural land, urban land and conservation land. After all the data were processed and assigned, the appropriate layers of the three land-use types were obtained. Then, the construction of the LUCIS model was completed to obtain the layers of potential land-use conflicts in Jinghe County. The results show that there are 22 kinds of land-use conflicts in Jinghe County, among which there are 10 kinds of potential land-use conflicts. The 22 kinds of land-use conflicts can be divided into five categories: non-conflict, conflict between agricultural land and urban land, conflict between urban land and protected land, conflict between agricultural land and protected land, and high conflict. The area with potential land-use conflict in Jinghe County accounts for about 47.85% of the total area, which is about the same as the area without conflict. The area of high-conflict area is 21.50×104 hm^2, accounting for 19.22%, and the high-conflict area is concentrated in the intersecting area of existing agricultural land and existing city and its buffer zone. The conflict between agricultural land and urban land is 18.74×104 hm^2, accounting for about 16.75% of the total area. The area is also wide and the conflict intense. The conflict area between protected land and urban land accounts for about 11.61% of the total area, while the conflict area between protected land and agricultural land is relatively small, accounting for only 0.26% of the total area. Conflict-free areas account for about 20.39% of the total area, and their spatial distribution is relatively dispersed. The research results have practical significance for maintaining ecological security and sustainable development of the social economy in desertification areas*[2].

Keywords: *Jinghe County, land-use conflict, LUCIS model*

1. Introduction

Since the 1990s, the issue of land scientific use has attracted widespread attention from governments and international organizations around the world, and its process, trend, driving force and the resulting comprehensive evaluation of the ecological environment are the focus of research [1]. Among them, land-use conflict can be summarized as various contradictions and antagonism caused by the imbalance of land-use mode, improper land-use structure, and unreasonable quantity and space allocation, and it can lead to different degrees of social, economic and environmental harm. This process can occur at any spatial scale, but changes at the small and medium scales will have an important cumulative amplification effect on large-scale regions, and thus they have an important impact on the global change. Therefore, the environmental effects caused by the scientific use of small- and medium-scale land are not only regional, but also global. As early as the 1770s, the highly unbalanced distribution of social production relations and land ownership led to land-use conflicts in Brazil and other places [3]. Foreign scholars believe that land-use conflicts in the modern sense began in the 1960s and 1970s, and they mainly occurred in developing countries with unequal regional resources and uncoordinated internal regions and countries with intensified industrialization [4]. Starting from this, although a series of important results have been achieved [5-7], no consensus has been reached on the concept, causes, and classification of land-use conflicts. In terms of research methods, geographic information systems (GISs), artificial neural networks (ANNs), spatial analysis, game theory and other methods are mostly used, and empirical research and quantitative analysis are emphasized on the basis of qualitative research [8]. The domestic academic research on land-use conflict started relatively late,

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

starting from the Yangtze River and Rhine River flood disaster and land-use conflict conference jointly held by China and Germany in 2000. With in-depth exploration of the concept, causes and types of land-use conflicts by domestic scholars, the focus of research has shifted to case analysis and evaluation of land-use conflicts, with qualitative analysis as the main method and quantitative evaluation as supplementary [9-13].

As a typical desert–oasis landscape in the arid area of northern China, Xinjiang is an ecologically fragile region. Oases are an important component, and the most fundamental activity is land use. However, with the increase in the regional population and the intensification of urbanization in recent decades, coupled with the combined effects of the arid climate conditions and spatial differences in water resources distribution, a series of serious ecological crises have been caused in the process of land use, such as the emergence of two major ecological hot spots in Xinjiang: Tarim River basin in southern Xinjiang and Aibi Lake basin in northern Xinjiang [14]. Since the founding of the People's Republic of China, a large number of research studies on land-use science in Xinjiang have mostly been qualitative and quantitative research studies at the macro level, while research studies on potential land-use conflicts and their prevention from the inherent level are relatively few but more instructive. Based on this, this study used remote sensing and geographic information technology to select Jinghe County, an oasis in an arid region, as a typical target area to carry out dynamic evolution and modeling research of potential land-use conflicts, establish a suitability evaluation system, and distinguish potential land-use conflicts in Jinghe County based on the land-use preference degree. It can not only provide a decision-making basis for regional ecological environment governance, the Eurasian Land Bridge unimpeded project and other major projects in the West, but also provide an example for the ecological environment development planning of China's Silk Road Economic Belt.

2. Overview and Data Sources of the Study Area

2.1. Overview of the Study Area

Jinghe County is located in the northwest of Xinjiang, the southwest edge of Junggar basin, and belongs to the Bortala Mongolian Autonomous Prefecture of the Xinjiang Uygur Autonomous Region. The spatial range is between 81° 46’e -- 83° 51’e, 44° 0’n -- 45° 10’n (Figure 1), with an average elevation of 400 m and a total area of 11.85×105 hm2. Of these, mountains account for about 41%, plains about 54%, and lakes about 5%.

The southern part of the study area is mainly a mountainous area, the central part is a sloping plain of foremountain alluvial–diluvial edges, and the northern part is an alluvial lacustrine plain with flat, open terrain with a mostly saline–alkali marsh area due to the high water level. The agricultural area is mainly concentrated on the piedmont plain. Aibi Lake is in the northernmost part of the study area. It is the second largest saltwater lake in Xinjiang, with an elevation of 189 m above sea level. The study area has a typical continental climate with abundant sunshine, cold winters, hot summers, and dry and little rain.

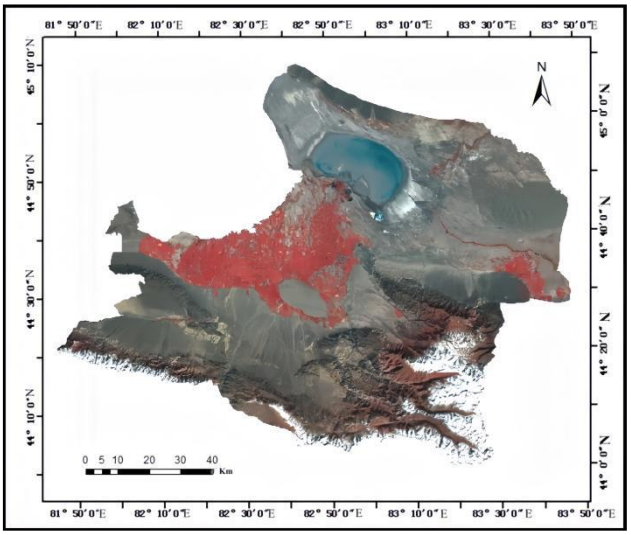

Figure 1: Sketch map of the study area

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

2.2. Data Sources

This paper selects Landsat 8 remote sensing image data from September 24, 2019, and uses ENVI and ArcGIS software platforms to complete image geometric correction, projection conversion and other pre-processing steps. According to the standard, the current land use was divided into the following six land types: cultivated land, forest land, grassland, water area, construction land, and unused land. The Kappa coefficient of the land-use classification was 0.87, which met the accuracy verification.

Meteorological data were obtained from the following five meteorological stations: Alashankou meteorological station (station number: 51232), Tori meteorological station (station number: 51241), Wenquan Meteorological station (station number: 51330), Jinghe meteorological station (station number: 51334), and Wusu meteorological station (station number: 51346).

The required statistical data are from the Statistical Yearbook of Jinghe County from 1990 to 2018, the government network of Jinghe County, the Statistical Communique of Jinghe County for 30 years of reform and opening up, and the agriculture and national economic accounting part of Xinjiang Statistical Yearbook.

3. Research Methods

As a set of systematic quantitative identification methods formed for the first time in the field of land-use conflict research, the "land-use conflict identification strategy (LUCIS)" proposed by Carr et al. [14] in 2005 mainly realizes the measurement of conflict intensity and the identification of spatial location through three steps as follows: suitability analysis, identification of land-use preference, and mapping of land-use conflict. This study mainly sets three types of land-use targets, namely construction land, agricultural land, and ecological land.

3.1. The Potential Land-Use Conflict Adaptability Evaluation System

Based on the LUCIS model, a preference evaluation system for urban land, agricultural land, and protected land was constructed from the perspective of suitability. The preference evaluation right for urban land mainly reflected the natural, social and economic feasibility of land transfer for urban land, and the preference evaluation for agricultural land turned to assessing the dynamic strength of land or maintaining protected land. The feasibility of natural factors and location factors of protected land can be obtained through the water area, forest area and existing protected land area. Assigning weight to its various factors can better determine the suitability of some areas as certain purposes in the future(see Table 1-3).

Table 1: Land use suitability of agricultural land

Classification layer	Factor value	Factor layer	Factor grading				
			High preference (9)	Medium preference (7)	Medium to low preference (5)	Low preference (3)	No preference (1)
suitability	Natural (0.60)	Land fertility (0.4)	1.95-1.8	1.8-1.6	1.6-1.4	1.4-1.2	≤1.2
		Water source, m (0.28)	0-7860	9596.75-11333.5	13070.25-14807	16543.75-18280.5	20017.25-40262.8
		Average annual temperature, °C (0.19)	≥7℃	6.7℃-6.4℃	6.1℃-5.8℃	5.5℃-5.2℃	4.6<℃
		Slope, ° (0.13)	0°	3°-6°	9°-12°	15°-18°	≥21
	Location (0.40)	Road European distance, m	0-8897	11165.5-13434	15702.5-17971	20239.5-22508	24776.5-44169.7
		Current agricultural land, m	≤10	＞1000	＞1000	＞1000	＞1000

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

Table 2: Land use suitability of protected land

Classification layer	Factor value	Factor layer	Factor grading				
			High preference (9)	Medium preference (7)	Medium to low preference (5)	Low preference (3)	No preference (1)
suitability	Natural (0.40)	Open water, m	0-120	120-240	\	\	>240
		Natural forest land, m	0	\	\	\	>0
	Location (0.60)	Current protected land,m	0	\	\	\	>0
		Distance from protected land,m	0-25846	25846-32106.75	\	\	32106.75-93990.1

3.2. Preference for Potential Land-Use Conflicts

The suitability of land use is indeed to find the most suitable land for a certain type purpose. The determination of land is based on the interaction of natural factors and location factors, both of which need to be taken into account. The influencing factors of each factor are weighted to obtain the final layer.

3.3. Identification of Potential Land-Use Conflicts

Table 3: Suitability of urban land use

Classification layer	Factor value	Factor layer	Factor grading				
			High preference (9)	Medium preference (7)	Medium to low preference (5)	Low preference (3)	No preference (1)
suitability	Natural (0.50)	Water source, m (0.28)	0-7860	9596.75-11333.5	13070.25-14807	16543.75-18280.5	20017.25-40262.8
		Slope, ° (0.13)	0°	3°-6°	9°-12°	15°-18°	≥21
	Location (0.50)	Road distance,m	0-8897	11165.5-13434	15702.5-17971	20239.5-22508	24776.5-44169.7
		The current city,m	0	\	\	\	＞0
		Distance from existing urban land,m	0-18835	22019.5-25204	28388.5-31573	34757.5-37942	41126.5-60672

According to the evaluation results of the land preference degree of the urban, agricultural and protected land, the results were classified into 27 types of conflict situations. The 27 types of conflicts were further divided into 4 types of conflict areas and 12 types of potential land-use conflict types, and the classification of the conflict type was concluded (see Table 4).

Table 4: Zoning table of potential land use conflicts

Conflict partitioning		Degree of suitability			Instructions
		Agricultural land	Urban land	Protected land	
Advantage area	Agricultural preference area	High	Weak	Weak	The adaptability of agricultural land is higher than that of urban land and protected land
		High	Medium	Weak	
		High	Medium	Medium	
		High	Weak	Medium	
		Medium	Weak	Weak	
		Weak	High	Weak	
		Medium	High	Weak	
	Urban preference area	Weak	High	Weak	The adaptability of urban land was higher than that of agricultural land and protected land
		Medium	High	Weak	
		Weak	High	Medium	
		Medium	High	Medium	
		Weak	Medium	Weak	

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

	Protection preference region		Weak	Weak	High	The adaptability of protected land was higher than that of agricultural land and urban land
			Weak	Medium	High	
			Medium	Weak	High	
			Medium	Medium	High	
			Weak	Weak	Medium	
Potential conflict zone	High conflict area	Agriculture and city	High	High	Weak	The suitability of agricultural land and urban land is stronger than that of protected land
			High	High	Medium	
		Agriculture and conservation	High	Weak	High	The suitability of agricultural land and conservation land is stronger than that of urban land
			High	Medium	High	
		Cities and conservation	Medium	High	High	The suitability of conservation land and urban land is stronger than that of agricultural land
			Weak	High	High	
		Agriculture and cities and conservation	High	High	High	The suitability of agricultural land and urban land to protect land is strong, so there is a high conflict
	Middle conflict area	Agriculture and city	Medium	Medium	Weak	The degree of suitability of agriculture, city and conservation is medium
		Agriculture and conservation	Medium	Weak	Medium	
		Cities and conservation	Weak	Medium	Medium	
		Agriculture and cities and conservation	Medium	Medium	Medium	
	Low conflict area	Agriculture and cities and conservation	Weak	Weak	Weak	The suitability degree of agriculture, city and protection is low

4. Results

4.1. Analysis of the Distribution Characteristics of Three Types of Land-Use Preference Intensity

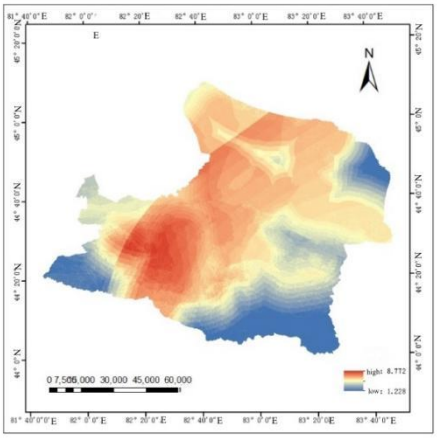

Figure 2: Agricultural land preference

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

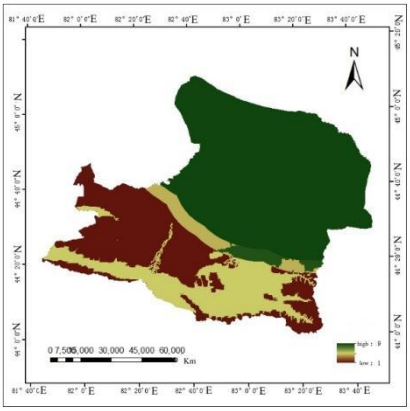

Figure 3: Conservation land preferenc

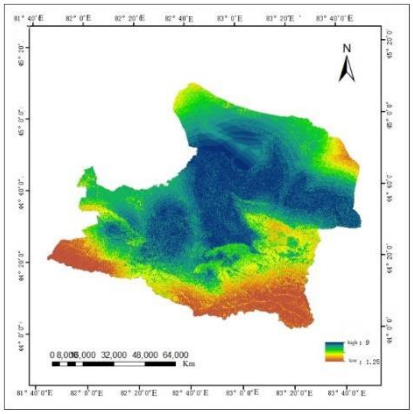

Figure 4: Urban land preference

Through the analysis of Jinghe County's land use and its three types of land-use preference, the following conclusions can be made. Figure 2 shows the land-use preferences of high, medium and low agricultural land. From a spatial perspective, the preference for agricultural land in Jinghe County showed a trend of higher in the west and lower in the east, among which the highly preferred areas were mainly concentrated in the agricultural irrigation area in the southwest and central part of the county, while the lesser preferred areas were mainly concentrated in the southeast, northeast and the current construction areas; this was significantly different from the trend distribution of construction land. The high preference areas account for the largest proportion of agricultural land, followed by the medium preference areas, while the low preference areas account for the smallest proportion, indicating that the agricultural land in this region is widely distributed and of high-quality, and the agricultural advantages in counties and towns are more prominent and the agricultural industry more developed.

Figure 3 shows the land-use preferences of high, medium and low types of protected land. From the perspective of space, Jinghe County's protected land preference generally presents a trend of high in the north and low in the south. The area of low preference is the same as that of medium preference, and the area of high preference is the largest, but it is much larger than the area of high preference for construction land and agricultural land because the protected land area includes the Ebi Lake and the natural area around the lake, which has excellent ecological conditions. As a result, the protected land preference in this area is more prominent, and the protected land preference area shows obvious balanced distribution characteristics.

Figure 4 shows the land-use preferences of high, medium and low types of protected land. From the perspective of space, the preference for urban land use in Jinghe County shows a trend of high in the middle and lower in the surrounding areas, in which the proportion of medium preference area is the largest, followed by the low preference areas, while the proportion of high preference area is the smallest, indicating that the expansion momentum of urban land use in this area is insufficient and the economic development is lagging behind. The high preference area is mainly concentrated in the areas with higher urbanization levels in the northeast and southwest of Jinghe County, the township area and the area around the main road, while the low preference area is mainly concentrated in the southeast of the county, the junction between towns and the southwest area.

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

4.2. Potential Land-Use Conflicts in Jinghe County

Potential land-use conflicts are distributed among agricultural land, urban land and protected land in Jinghe County (see Table 5), in which the area of conflict is 53.52 km^2. This includes conflict areas between agricultural land and protected land, between agricultural land and urban land, between protected land and urban land, and between all three types of land. This accounts for 47.85% (~50%) of the total area of Jinghe County, indicating that the land-use conflict situation is relatively severe in Jinghe County, while the conflict-free area accounts for about 20.39% of the total area of the study. The existing protected land and urban land are difficult to convert into other land in land planning; therefore, we subtract them when calculating their area, making the existing protected land and urban land account for about 31.77% of the total area of Jinghe County(see Figure 5).

Table 5: Percentage of each type of land use conflict in the study area

category	Area (hm2)	Percentage of the study area
Conflict between agricultural land and protected land	2902.77	0.26
Conflict between agricultural land and urban land	187397.46	16.75
Conflict between protected land and urban land	129914.73	11.61
High conflict	214978.32	19.22
A conflict-free zone	228048.30	20.39
Existing urban land	6144.30	0.55
Existing protected land	349177.05	31.22
Amount to	1118562.93	100.00

Agricultural land and urban land have shown an expanding trend (see Figure 6). In Jinghe County, the growth of agricultural land is relatively slow, while the growth of construction land is always accelerating. The increase in land use in Jinghe County will inevitably lead to land-use conflicts, and the expansion of industrial zones will likely begin to occupy agricultural land in the process of urban development. The main conflicts between agricultural land and urban land in Jinghe County in the future will mainly be concentrated in the existing agricultural land and the area extending southwest and south, accounting for 16.75% of the total area of the study area. This region is close to the existing agricultural land and urban land and has abundant water resources and convenient transportation routes. These factors are favorable in the expansion planning of the two regions, and so the conflict will be relatively high.

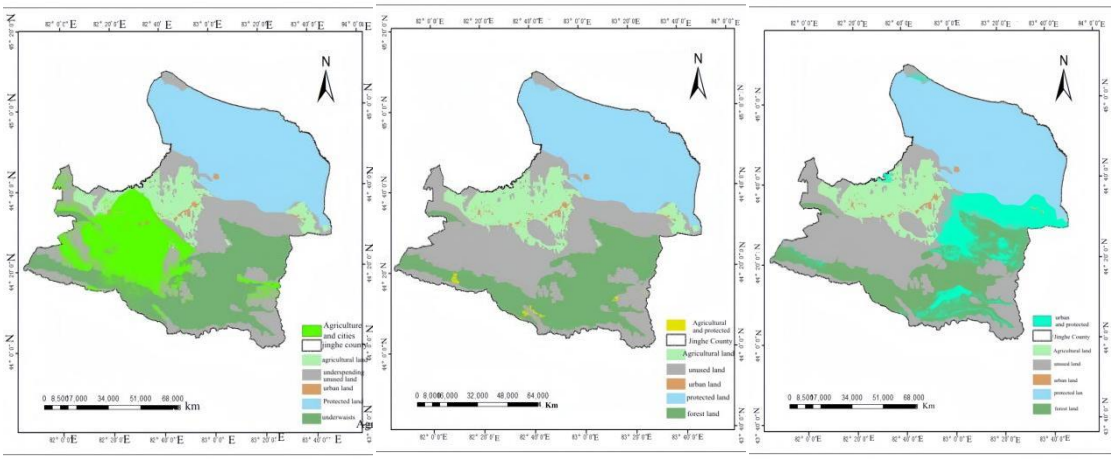

Figure 5: Three types of land use conflict situation

The potential land-use conflicts between agricultural land and conservation land (see Figure 6) and the practical significance of planning in advance were investigated. The potential land-use conflicts between agricultural land and protected land are scattered, and the conflict area accounts for about 0.26% of the total area of the study area, which is very small. The conflict area is mainly concentrated at the edge of the already forested area, and the characteristics of the counties and towns around the conflict area are suitable for agriculture and foresting, so there is a certain conversion probability of agricultural land and protected land in some small areas. The conflict probability of large-scale agricultural land is less than that of protected land.

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

The potential conflict area between urban land and protected land (see Figure 6) is mainly concentrated in the southeast of the existing protected area, accounting for 11.60% of the total area of the study area. The potential conflict area is connected with the protected area, and the distribution is banded along the boundary of the protected area. Although the conflict of land preference between protected land and urban land is of the same level, the ecological value is mainly considered when the protected area is expanded in the future, while the urban value is second. Therefore, protected land is actually more competitive than urban land.

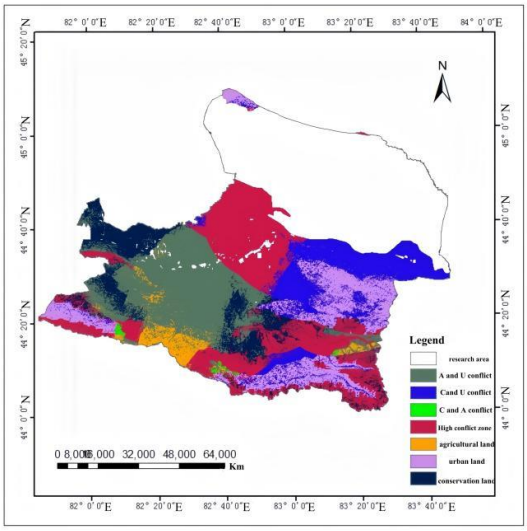

Figure 6: Distribution of 7 conflict type

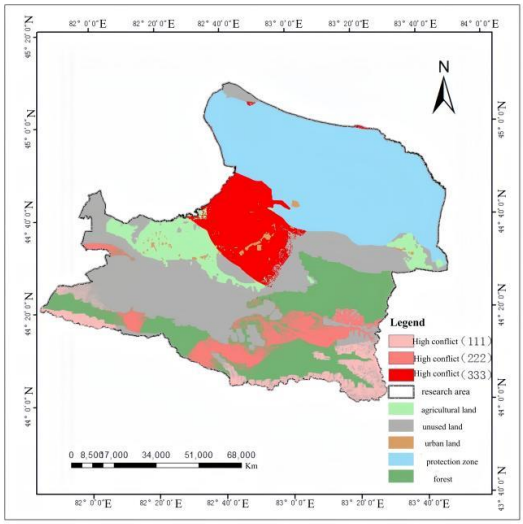

Figure 7: Three types of high conflict

The potential land-use conflicts among the three land types are mainly distributed in the oasis plain area of the Jinghe basin (see Figure 7) and the high mountain area in the south of Jinghe County, accounting for about 20% of the total area of the study area. It can be seen from the figure that the high-conflict areas with a high preference for the three land types are mainly located in the oasis central area of the Jinghe River basin, which is close to agricultural land, urban land and protected land. The high-conflict areas with a medium preference are distributed in the pre-alpine areas far from the agricultural land, urban land and protected land. The areas with a low preference are located in the snowy mountains in the southernmost part of Jinghe County. The low preference value indicates that the preference for the three types of land is very low. The existing urban land with the same land-use type covers a small area and will face great conflicts in the future urban expansion. The existing protected land accounts for about 30% of the authorized area of Jinghe County, which is also because there are two nationally protected areas in Jinghe County—Ganjiahu National Nature Reserve and Aibi Lake Wetland Nature Reserve. They are located in the area around Ebi Lake, so the conflict over the protection of land is mainly concentrated around this area.

5. Discussion

(1) The potential land-use conflict evaluation system based on the LUCIS model can scientifically and reasonably identify the potential land-use conflict situation in this region. Most of the existing studies discuss the conflict between ecological security and environment in arid areas from the perspective of economic development. Different from other regions, Jinghe County is an arid region, affected by topographic and geomorphic factors, and its land-use situation is a stepped development with a complex land use situation, many impact factors, and fragile ecological environment. Therefore, scientifically identifying potential land-use conflicts in this region is particularly critical. Starting from the land-use goals of food security, economic development, and ecological protection, this study constructed a classification system for agricultural land, urban land, and protected land to match the current land-use needs. In order to improve the scientific rationality of the results of conflict identification when using the LUCIS model to build evaluation indicators, this study considered the regional characteristics of Jinghe County, selecting factors such as slope, elevation, and relief degree that have an important impact on the land-use pattern of the region to build a land conflict evaluation system, and subsequently, identifying 27 types of conflict. Then, the 27 types of conflicts were subdivided into 4 types of conflict areas and 12 types of potential conflicts, among which the conflict between construction land and agricultural land was found to be the most significant. The potential

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

land-use conflict evaluation system based on the LUCIS model breaks the limitations of previous conflict evaluation systems, playing an important role in identifying land-use conflict problems in this type of area and in coordinating the structure and layout of resources, the environment, ecology and other factors in arid zone planning.

(2) According to the land-use conflicts of different land types, the formulation of differentiated coordination strategies can effectively alleviate the conflicts and contradictions of such land use, providing a reference for realizing regional sustainable development. Land-use conflict is the concentrated embodiment of land planning, urban planning, and other spatial planning conflicts in land use. One of the main objectives of territorial spatial planning is to coordinate the conflicts existing in various spatial planning, and thus land-use conflict coordination is a top priority [15]. The research results based on land-use conflict identification and coordination play a guiding role in land management practices in basic farmland demarcation [16] and "three-line" demarcation [17]. In addition, this study proposed conflict coordination strategies from the perspective of environmental protection, also providing a new perspective for resolving land-use conflicts in arid areas and determining land-use zoning under territorial spatial planning. Jinghe County is a typical arid area oasis, where the ecological environment is extremely fragile and social and economic development is important; however, without the background of ecological stability, one cannot talk about the economy nor development. Jinghe County has two national nature reserves, Ganjiahu National Nature Reserve and Aibi Lake Wetland Nature Reserve, in which ecological restoration and breeding is allowed to be the main cultivation. Therefore, resources can be used rationally under the premise of protecting the ecological environment as the first priority; and the rich diversity of species and their habitats can be protected; the land can be used efficiently in the arable area; and the crop yield, scientific breeding, and economic yield in the farmed area can be increased. On the one hand, ecological stability is protected, while on the other hand, conflicts between protected land, urban land, and agricultural land are reduced.

6. Conclusion

Using the ArcGIS software and The land-use conflict identification strategy (LUCIS) model, this paper classified the land-use types of Jinghe County and drew the following conclusions:

1) There are 22 types of land-use conflict in Jinghe County, 12 of which are potential land-use conflicts.

2) The areas with conflicts in Jinghe County account for about half of the county area, and the areas with high conflicts account for 19.22%, mainly distributed in the oasis center of Jinghe County. There are few conflict areas between agricultural land and protected land, with most being between agricultural land and urban land. The conflict areas include existing agricultural land and the extension of agricultural land to the southwest and south of the desert areas.

3) The areas with no potential land-use conflicts in Jinghe County also account for about 52.15% of the county area, including (1) identified urban land and protected land, (2) areas without conflicts, (3) areas with a higher preference for agricultural land than the other two land types, (4) areas with a higher preference for urban land than the other two land types, and (5) areas with a higher preference for protected land than the other two land types.

4) According to the results of potential land-use conflicts, three suggestions for sustainable land use are put forward as follows: (1) Increase the yield of existing farmland and minimize the pressure of expanding farmland. (2) Control population growth and improve the utilization rate of existing urban land. (3) Protect the ecological environment and make rational use of protected land.

References

[1] Li, X.B. International research trends in land use/land cover change, a core area of global environmental change research. Acta Geogr. Sin. 1996, 51, 553-558.
[2] Siddig, E.F.A.; El-Harizi, K.; Prato, B. Managing conflict over natural resources in greater Kordofan, Sudan: Some recurrent patterns and governance implications; International Food Policy Research Institute (IFPRI): Washington, DC, 2007.
[3] Tan, S. Summary of foreign research on land conflict and its management. China Land Sci. 2007, 21, 74-80, doi:10.3969/j.issn.1001-8158.2007.04.013.
[4] DeFries, R.S.; Foley, J.A.; Asner, G.P. Land-use choices: Balancing human needs and ecosystem

ISSN 2616-5872 Vol.5, Issue 10: 72-81, DOI: 10.25236/AJEE.2023.051010

function. Front. Ecol. Environ. 2004, 2, 249-257.
[5] Junior, R.F.V.; Varandas, S.G.P.; Fernandes, L.F.S.; Pacheco, F.A.L. Groundwater quality in rural watersheds with environmental land use conflicts. Sci.Total Environ. 2014, 493, 812-827.
[6] Junior, R.F.V.; Varandas, S.G.P.; Fernandes, L.F.S.; Pacheco, F.A.L. Environmental land use conflicts: A threat to soil conservation. Land Use Policy 2014, 41, 172-185.
[7] Varandas, S.; Pacheco, F.; Pereira, V.; Cortes, R. Impacts of land use conflicts on riverine ecosystems. Land Use Policy 2015, 43, 48-62.
[8] Adam, Y.O.; Pretzsch, J.; Darr, D. Land use conflicts in central Sudan: Perception and local coping mechanisms. Land Use Policy 2015, 42, 1-6.
[9] Xiao, H.; Yuan, Q.; Song, F. Study on the evolution process and formation mechanism of land use conflict in Urban Scenic Spots: A case study of Xiwuzi Mountain Scenic Spot. Chin. Landsc. Archit. 2013, 29, 117-120.
[10] Liu, Q.; Zhao, H.; Wu, K.; Yu, X.; Zhang, Q. Potential land use conflict identification based on land use competitiveness: A case study of Daxing District, Beijing. Resour. Sci. 2014, 36, 1579-1589.
[11] Chen, W.; Liu, X. Potential land use conflict diagnosis based on suitability assessment: A case study of Honghe County, Yunnan Province. J. Gansu Agr. Univ. 2015, 50, 123-130,139, doi:10.3969/j.issn.1003-4315.2015.01.022.
[12] Xu, Z.M. Research on land use conflict management based on stakeholder theory. Master's thesis, Zhejiang University, Hangzhou, 2011.
[13] Zheng, L.P. Identification of potential land use conflict and its application in the demarcation of basic farmland. Master's thesis, Shenyang Agricultural University, Shenyang, 2012.
[14] Yang, Y.; Liu, Y.; Zhu, L. Theory and method of land use conflict tradeoff Areal Res. Dev. 2012, 31, 171-176, doi:10.3969/j.issn.1003-2363.2012.05.035.
[15] Yang, Y.; Zhu, L. The theory and diagnostic methods of land use conflicts. Resour. Sci. 2012, 34, 1134-1141.
[16] Shi, Y.; Yang, Z.; Xin, G.; Yang, H.; Wei, Z. Hilly area of potential land use conflict - Chongqing metro, for example. Res. Soil Water Conserv. 2021, 28, 316-324, doi:10.13869/j. cnki.rswc. 2021. 05.036.
[17] Ruan, S.; Wu, K. Research on land use conflict and its mitigation mechanism in the process of urbanization: from the perspective of non-cooperative game. China Popul. Resour. Environ. 2013, 23, 388-392.