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Changes in land use in Lai Chau city, Lai Chau province, Vietnam during 2020 - 2023

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ABSTRACT: *Lai Chau city is the administrative, economic, political, cultural and social center of Lai Chau province, with a natural area of 9,687.99 hectares, accounting for 1.07% of the total area of the province. In the period 2020-2023, agricultural land accounted for the highest structure in the land use structure of Lai Chau city (over 72% of the city's total land area); non-agricultural land accounted for about over 12% and unused land accounted for over 14%. From 2020 to 2023, agricultural land and unused land were decreasing gradually, while non-agricultural land was increasing gradually. The structure and changes inland use in Lai Chau city were consistent with the development planning of Lai Chau province and Lai Chau city, and at the same time consistent with the local socio-economic situation.*

Keywords: *agricultural land, non-agricultural land, unused land, changes in land use, Lai Chau city*

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I. INTRODUCTION

Land is a limited and extremely valuable resource, used by people for many different purposes, especially in the context of population growth and current economic development needs. In recent decades, Vietnam had witnessed dramatic changes in land use, reflecting economic and social developments and environmental challenges. Rapid urbanization, especially in large cities such as Hanoi and Ho Chi Minh City, has led to the expansion of urban land areas and the conversion of large amounts of agricultural land to construction purposes of industry and services [1]. In Hanoi city, from 2021 to April 2024, the total area allowed to be converted from rice land to other purposes to implement investment projects is 5,994.65 hectares, of which, the actual area had been converted is 2,207.74 hectares [2]. In Ho Chi Minh City, from August 1, 2023, the City People's Council had the authority to decide to change the use purpose of rice land under 500 hectares [3]. In addition to big cities, urbanization along with the formation of industrial parks and economic zones in rural areas to attract investment also changed the structure of land use. The process of urbanization and industrialization had a strong impact on land, especially agricultural land [4, 5]. In Dong Hy district (Thai Nguyen province), in the period 2018 - 2022, the area of agricultural land will decrease from 13,635 hectares (2018) to 14,496 hectares (2022) [6]. Urbanization and economic transition also significantly affect the landscape and land use in coastal areas [7]. Land use changes not only create opportunities for economic development but also pose challenges in maintaining a balance between development and protection of natural resources. Analyzing land use changes helps management agencies better understand land use trends and patterns, thereby making reasonable policy and planning decisions.

Lai Chau city is the administrative, economic, political, cultural and social center of Lai Chau province, with a natural area of 9,687.99 hectares, accounting for 1.07% of the total area of the province [8]. Lai Chau city's terrain is relatively flat, with an average slope of 5-10%; Average annual temperature 19.2°C; Annual rainfall is distributed almost evenly throughout the months and is quite large [9]. Lai Chau city has 7 administrative units (5 wards and 2 communes) with a population of 47,040 people; Population density is 485.40 people/km2 [8].

Fig. 1. San Thang market in Lai Chau city - the largest market in Lai Chau province

The economic structure of Lai Chau city tends to shift towards increasing the proportion of the service industry, reducing the proportion of agriculture - forestry - fishery and construction industry. In 2020, the construction industry accounted for 30.9% of the city's total economy; Services accounted for 63.9% and agriculture, forestry and fishery accounted for 5.2% [9]. With a large total agricultural land area, Lai Chau city focuses on developing commodity-oriented agriculture and structural transformation in agricultural and forestry production. By 2023, the proportion of the industrial and construction sector will account for 38.03%; Services account for 40.14% and agriculture accounts for 15.16% [10].

Lai Chau city became a class III urban area in 2013 and is in the process of upgrading to a class II urban area (period 2021-2025) [11,12]. Urban development accompanied by land use changes is an inevitable trend of change. In that context, analyzing land use changes in Lai Chau city in the period 2020 - 2023 becomes extremely necessary. This study focuses on analyzing data related to area and land use purposes from 2020 (the year before starting the process of upgrading Lai Chau city to a class II urban area) to 2023 in Lai city. Chau. In addition, the study will consider the main impact factors, including socio-economic development and planning policies in the study area. The objective of the study is to provide an overview of changing trends and to help better understand the causes and consequences of land use changes. Through this, managers and policy makers can make timely and effective decisions to manage land resources sustainably, support reasonable urbanization and protect the environment.

II. RESEARCH METHODS

The data used in this study includes the land use planning map of Lai Chau city for the period 2021-2023, socio-economic data (including population, administrative, infrastructure and economics), data on natural conditions, policy and planning data and actual survey data.

During the research process, the project used some of the following methods:

Data collection method: Collected from official document sources such as legal documents, Government resolutions, reports of the Ministry of Natural Resources and Environment, land use planning of Lai Chau Provincial People's Committee, statistical yearbook of Lai Chau province... In addition, data sources are also collected from previous research, scientific articles related to land use changes and public databases of agencies. state officials.

Data processing and analysis methods: Statistical methods: Apply statistical techniques (such as trend analysis, regression) to analyze data and identify factors affecting land use changes. The authors used SPSS statistical software during the research process to analyze trends in land area changes in Lai Chau city. Comparison method: Compare land use data in different years to identify trends and fluctuations.

Actual survey method: Field survey of the research area on socio-economic conditions and infrastructure in Lai Chau city.

III. RESULTS AND DISCUSSION

3.1. Overview of land use situation in Lai Chau city in the period 2020 - 2023

Lai Chau city has the lowest total natural area in Lai Chau province with 9,687.99 hectares, accounting for 1.07% of the total area of the province.

In the period 2020-2023, agricultural land accounted for the highest structure in the land use structure of Lai Chau city (over 72% of the city's total land area), mainly distributed in Sung Phai commune and San Thangcommune. This indicated that agriculture played a crucial role in the city's economy and land use strategy. The high percentage of agricultural land suggested that the region was reliant on farming activities for its livelihood and economic sustenance. Non-agricultural land accounted for about over 12% and unused land accounted for over 14% (Table 1, Fig. 1). This suggested a moderate level of urban development, infrastructure, and other non-agricultural activities. The structure of unused land indicated areas with future development potential, which could be used to expand agricultural activities, urban development or other purposes.

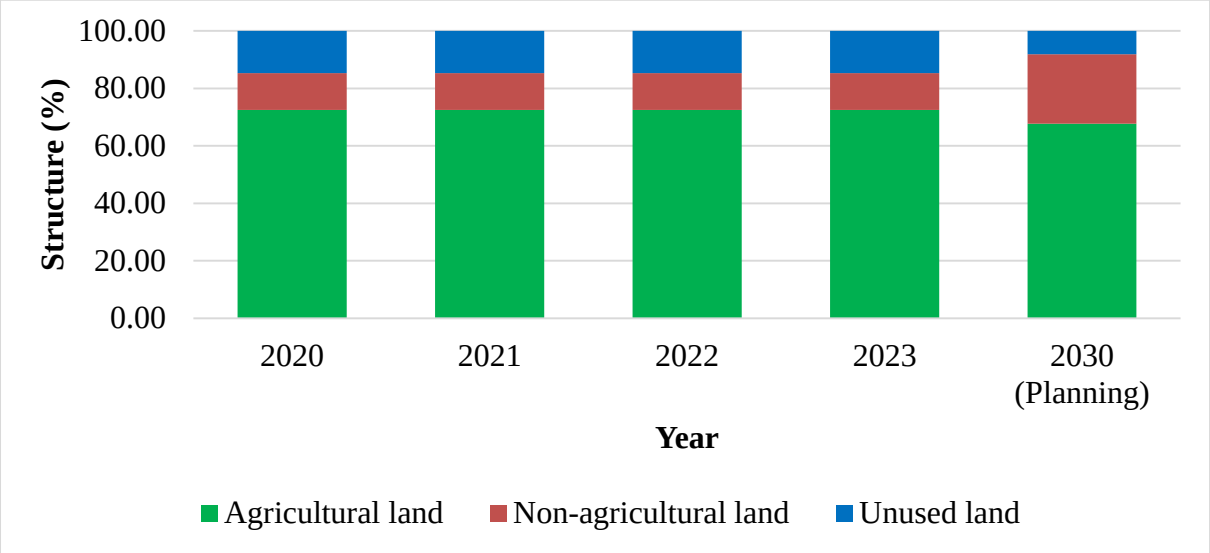


Fig. 1. Structure of land types in Lai Chau city in the period 2020-2023

gradually increasing use of non-agricultural land, reflecting ongoing urbanization and infrastructure development. The stable structure of unused land suggested consistent land management practices and potential for future development. Overall, the city's land use structure in 2023 indicated a balanced approach to maintaining its agricultural base while accommodating growth and modernization.

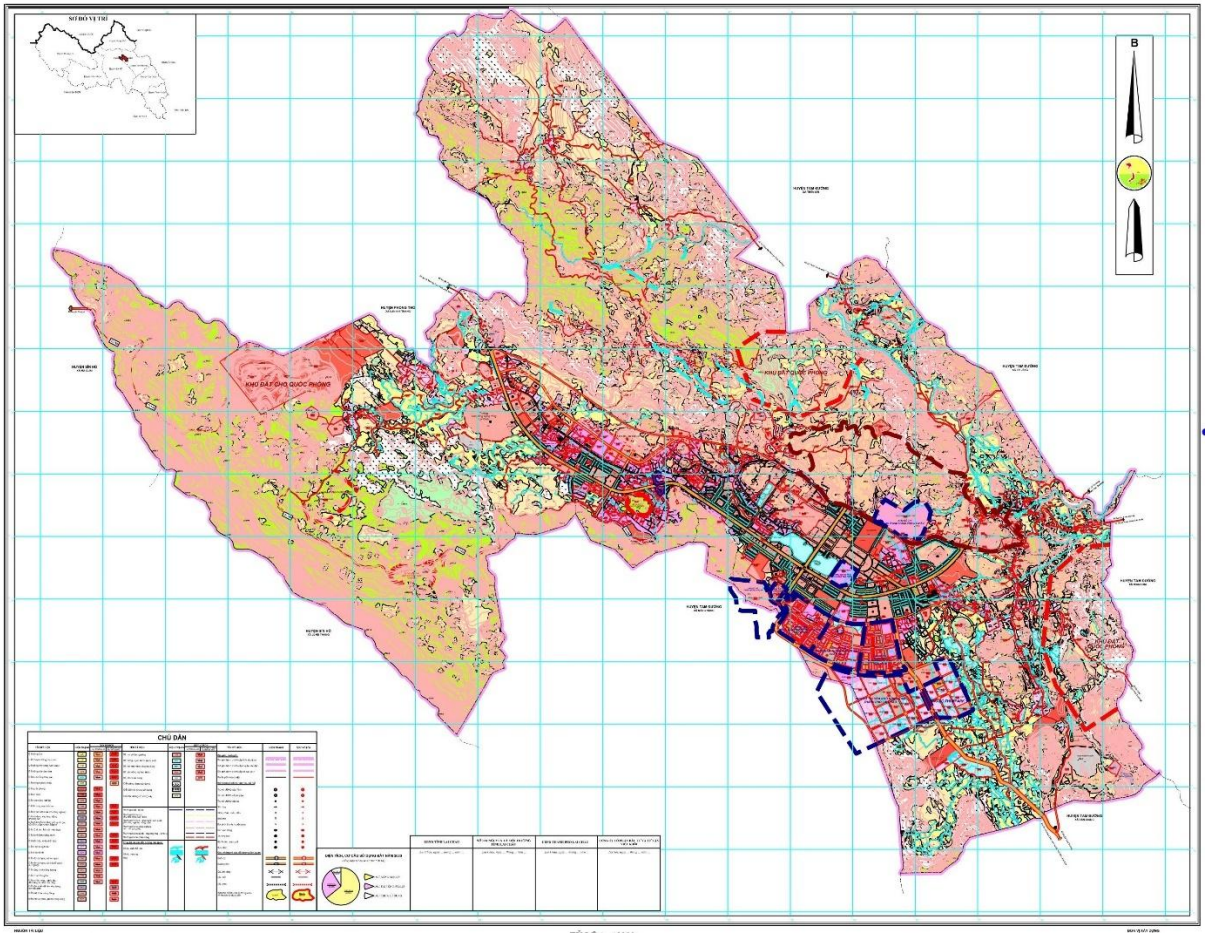
Table 1. Current status of land use in Lai Chau city in the period 2020-2023

Year	Agricultural land		Non-agricultural land		Unused land	
	Total area (ha)	Structure (%)	Total area (ha)	Structure (%)	Total area (ha)	Structure (%)
2020	7,029.78	72.56	1,232.27	12.72	1425.93	14.72
2021	7,029.76	72.56	1,232.70	12.72	1425.53	14.71
2022	7,026.20	72.52	1,236.70	12.77	1424.77	14.71
2023	7,022.58	72.49	1,241.21	12.81	1424.20	14.70
2030 (Planning)	6566.94	67.78	2337.07	24.12	783.98	8.09

(Source: Compiled from [13] – [18])

3.2. Land use changes in Lai Chau city in the period of 2020 - 2023

Aiming to upgrade to a class II urban area by 2025, on August 31, 2021, the People's Committee of Lai Chau province issued Decision No. 1152/QD-UBND on approving the Land Use Planning for the period 2021-2030 and Land Use Plan 2021 of Lai Chau city, Lai Chau province. In particular, the structure of land types according to use purposes had changed significantly (Fig. 2, Table 1, 2).



(Map source: Viet Khoi Investment and Consulting Joint Stock Company; Document source: Map investigating land use planning needs of communes and wards to 2030, Map of current land use status in 2020 Lai Chau street)

Fig. 2. Lai Chau city land use planning map for the period 2021 – 2030

Analyzing the correlation between the structure of land types in Lai Chau city shows that: There was a negative correlation between the structure of agricultural land and the structure of non-agricultural land, unused land and the structure of non-agricultural land with structure of unused land. As the area of agricultural land increased, the area of non-agricultural land and/or decreased; and vice versa (Table 2, Figure 3).

Table 2. Changes in land types in Lai Chau city in the period 2020 – 2023

Year	Agricultural land		Non-agricultural land		Unused land	
	Change in area (ha)	Rate of change (%)	Change in area (ha)	Rate of change (%)	Change in area (ha)	Rate of change (%)
2020						
2021	-0.02	0.00	+0.43	+0.03	-0.40	-0.03
2022	-3.56	-0.05	+4.00	+0.32	-0.76	-0.05
2023	-3.62	-0.05	+4.51	+0.36	-0.57	-0.04
2030 (Planning)	-455.64	-6.49	+1095.86	+88.29	-640.22	-44.95

Notes: -: Reduced area; +: Increased area

Agricultural land:In 2020, agricultural land accounted for 72.56% of the total land area. This structure remained constant in 2021 but started to decrease slightly in 2022 (72.50%) and continued to 72.49% in 2023. In general, the area of agricultural land tended to decrease slightly. However, this change was very small, suggesting that agricultural land use remained relatively stable.

Non-agricultural land:There was a gradual increase in non-agricultural land, from 12.72% in 2020 to 12.81% in 2023. The increase in non-agricultural land, although small, suggested a trend towards more urbanization and development. This was due to the construction of new buildings, infrastructure, or other non-agricultural developments.

Unused land:Unused land accounted for a higher structure than non-agricultural land. There was a slight decrease in unused land, from 14.72% in 2020 to 14.70% in 2023, showing a reduction of 0.02 percentage. The structure of unused land was relatively stable over the years, suggesting a consistent approach to land management without significant changes in land development or reclamation. The slight decrease in unused land indicated a marginal improvement in land utilization. Some of the previously unused land had been converted to either agricultural or non-agricultural use.

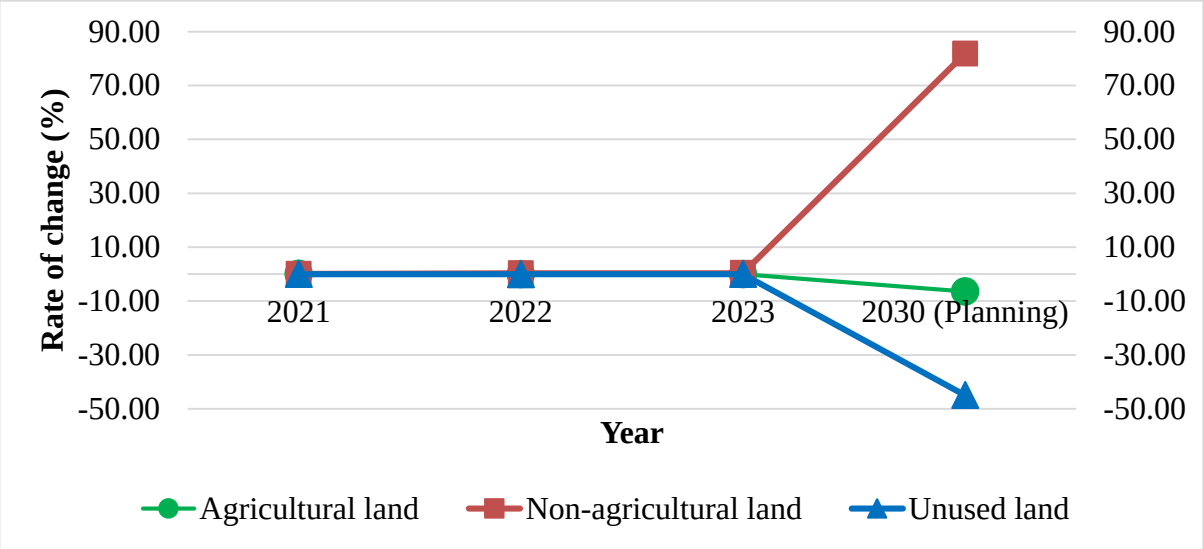


Fig. 3. Rate of the change in area of land types in Lai Chau city in the period 2020 – 2023

From 2020 to 2023,agricultural land and unused land were decreasing gradually, while non-agricultural land was increasing gradually. Looking ahead to 2030, the planned changes are more significant. The total agricultural land is expected to drop substantially to 6,566.94 hectares (67.78%), indicating a strategic move towards reducing reliance on agricultural land. Conversely, non-agricultural land is projected to increase dramatically to 2,337.07 hectares (24.12%). This planned increase underscores a major shift towards urbanization and development. Unused land is also set to decrease significantly to 783.98 hectares (8.09%), suggesting a comprehensive plan to optimize land use efficiency and minimize wastage.These changes suggest a trend towards urbanization and development, with more land being allocated for non-agricultural purposes and less for agricultural and unused land.This shift indicates a strategic approach to accommodate growth, enhance infrastructure, and optimize land use, aligning with broader development goals for the city's future.

IV. CONCLUSION

The data from 2020 to 2023 indicated a gradual shift in land use in Lai Chau city. Agricultural land and unused land were reduced, albeit slowly, while non-agricultural land was on the rise. The decrease in unused land, although minor, showed an effort to optimize land use. These trends suggested that Lai Chau city is in the midst of a transition towards more urban and developmental land uses.

The changes of using land from 2020 to 2023 set the stage for more significant transformations planned for 2030. The projections indicated a substantial reduction in agricultural land and a significant increase in non-agricultural land, underscoring a strategic move towards urbanization and development. This planned shift aimed to accommodate growth, enhance infrastructure, and made more efficient use of the city's land resources.

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