

## **Evaluation of Agricultural Land Utilization Based on the RTRW in North Sangatta District, East Kutai Regency**

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### **Abstrak**

Lahan pertanian memiliki peran penting dalam menjaga ketahanan pangan, kestabilan ekonomi masyarakat, dan keseimbangan lingkungan. Perkembangan kawasan permukiman dan aktivitas pertambangan di Kecamatan Sangatta Utara menyebabkan perubahan penggunaan lahan yang berpotensi mengurangi luas lahan pertanian produktif. Penelitian ini bertujuan untuk mengevaluasi kesesuaian pemanfaatan lahan pertanian aktual terhadap arahan Rencana Tata Ruang Wilayah (RTRW) di Kecamatan Sangatta Utara, Kabupaten Kutai Timur, serta mengidentifikasi perubahan penggunaan lahan yang terjadi pada kawasan pertanian. Penelitian menggunakan metode deskriptif komparatif dengan membandingkan kondisi penggunaan lahan aktual dan arahan RTRW Kabupaten Kutai Timur. Data diperoleh dari dokumen RTRW, citra Google Earth, artikel ilmiah, dan berbagai sumber sekunder lainnya. Pengumpulan data dilakukan melalui studi dokumentasi, observasi tidak langsung, dan studi literatur. Analisis dilakukan dengan mengidentifikasi kawasan pertanian sesuai RTRW, mendeskripsikan kondisi aktual penggunaan lahan, serta membandingkan kesesuaian penggunaan ruang di wilayah penelitian. Hasil penelitian menunjukkan bahwa penggunaan lahan di Kecamatan Sangatta Utara didominasi oleh kawasan permukiman, pertambangan, perdagangan dan jasa, serta kawasan budidaya masyarakat. Perkembangan permukiman dan aktivitas pertambangan menyebabkan sebagian kawasan pertanian berubah menjadi kawasan terbangun dan area nonpertanian. Namun, beberapa kawasan budidaya masyarakat masih sesuai dengan arahan RTRW dan memiliki tutupan vegetasi yang cukup baik. Oleh karena itu, pengawasan tata ruang dan pengendalian pemanfaatan lahan perlu dilakukan secara berkelanjutan untuk menjaga keberadaan kawasan pertanian sesuai arahan RTRW.

Kata kunci: Pemanfaatan lahan, Pertanian, RTRW, Perubahan lahan, Sangatta Utara

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### *Abstract*

*Agricultural land plays an important role in maintaining food security, economic stability, and environmental balance. The development of settlements and mining activities in North Sangatta District has caused land use changes that potentially reduce productive agricultural areas. This study aims to evaluate the suitability of actual agricultural land use with the Regional Spatial Plan (RTRW) directives in North Sangatta District, East Kutai Regency, and to identify land use changes occurring in agricultural areas. The study applied a comparative descriptive method by comparing actual land use conditions with the East Kutai Regency RTRW directives. Data were obtained from RTRW documents, Google Earth imagery, scientific articles, and other secondary sources. Data collection techniques included documentation studies, indirect observation, and literature review. The analysis was conducted by identifying agricultural areas according to the RTRW, describing actual land use conditions, and comparing the conformity of spatial use within the study area. The results show that land use in North Sangatta District is dominated by residential areas, mining activities, trade and service areas, and community cultivation zones. The expansion of settlements and mining activities has caused several agricultural areas to change into built-up and non-agricultural land. However, some cultivation areas still conform to the RTRW directives and maintain relatively good vegetation cover. Therefore, spatial monitoring and land use control are necessary to maintain agricultural areas in accordance with the RTRW directives.*

*Keywords: Agriculture, Land use, Land use change, North Sangatta District, Spatial planning*

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## INTRODUCTION

Agricultural land plays a crucial role in maintaining food security, community economic stability, and regional development (Putri & Amrullah, 2024). Agricultural areas not only serve as food producers but also as a source of income for those dependent on the agricultural sector (Maulana *et al.*, 2026). Agricultural activities also contribute to environmental balance by playing a role in water absorption, controlling erosion, and maintaining ecosystem quality in the region (Klau *et al.*, 2025).

Urban development and economic activity often impact agricultural land (Muhamad, 2011). The increasing demand for space for residential, commercial, industrial, and mining developments has triggered changes in land use in various regions. This situation can reduce the area of productive agricultural land if not accompanied by effective spatial planning (Asmara & Purbokusumo, 2022). The use of space that does not comply with the spatial plan can potentially lead to land use conflicts and harm the function of agricultural areas (Wirda, 2023).

The Regional Spatial Plan (RTRW) is created as a reference for managing spatial use in an area (Souhuwat *et al.*, 2025). The RTRW serves to direct regional development so that spatial use can be carried out in accordance with the potential and character of the area (Azqia *et al.*, 2025). Agricultural areas included in the RTRW are designated to ensure continued cultivation activities and to prevent irregular land use changes (Astuti & Lukito, 2020). The existence of the RTRW is an important foundation for implementing sustainable regional development (Yacob *et al.*, 2024).

North Sangatta District is a key area in East Kutai Regency that is experiencing rapid development. This region serves as a center for government, economic, and residential activities, and is supported by a significantly growing mining sector (Simanjuntak, 2025). This situation has resulted in high demand for space for various development activities. Land use in several areas is dominated by mining activities, developed areas, and settlements developing around cultivated areas (Hatta *et al.*, 2022).

The availability of agricultural land in North Sangatta District faces challenges due to regional development and increasing economic activity (Kurniawan & Rahmi, 2025). Several areas designated in the Regional Spatial Plan (RTRW) as agricultural zones have been converted to non-agricultural zones. This situation can impact the sustainability of the agricultural sector and reduce the function of space in accordance with spatial planning directives established by the local government (Hambali *et al.*, 2021).

The purpose of this study is to evaluate the suitability of actual agricultural land use to the Regional Spatial Plan (RTRW) guidelines in Sangatta Utara District, East Kutai Regency, and to identify the forms of land use changes that occur in agricultural areas due to residential development, economic activities, and mining. In addition, this study also aims to provide an overview of the condition of space use in agricultural areas as a consideration in more planned and sustainable spatial management. Assessment of agricultural land use is very important to understand the current state of land use compared to the RTRW guidelines (Widiastuti & Sudrajat, 2024).

This study aims to evaluate the suitability of actual agricultural land use to the RTRW guidelines in Sangatta Utara District, East Kutai Regency and to identify the forms of land use changes that occur in agricultural areas. This evaluation process can provide an overview of how space is used in agricultural areas and determine the possibility of land use changes that occur in Sangatta Utara District (Murtinah & Putra, 2024). It is hoped that the results of this study can be a source of information for local governments and communities to support more planned and sustainable spatial management (Paranoan *et al.*, 2023).

## **MATERIALS AND METHOD**

This study applies a comparative descriptive method to analyze the agricultural land use situation and compare existing land conditions with those outlined in the Regional Spatial Plan (RTRW) in North Sangatta District, East Kutai Regency (Rochman & Muryamto, 2023) (Desgasi *et al.*, 2022). The study focused on agricultural areas, which were analyzed using the East Kutai Regency RTRW document, Google Earth imagery, and land use information from various secondary sources. The study was conducted in 2026, focusing on agricultural land use conditions and changes in spatial use in the study area. The study population encompassed all land use areas in North Sangatta District, while samples were drawn from agricultural areas that complied with the East Kutai Regency RTRW guidelines. Sample selection was conducted using a purposive sampling method in accordance with the research objectives, focusing on areas designated for agriculture and experiencing progress in spatial use (Gafuraningtyas, 2022).

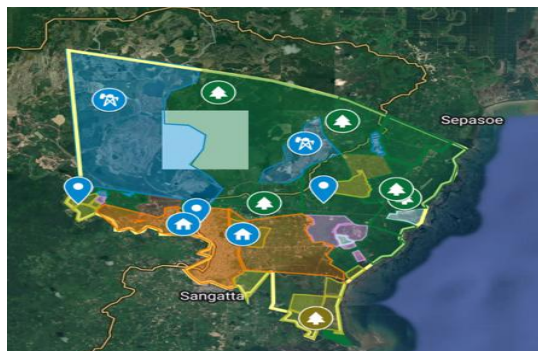
The data used in this study were secondary data obtained from the RTRW document, Google Earth images, scientific articles, books, and other sources related to agricultural land use and regional spatial planning. Data collection was conducted through documentation studies, indirect observation, and literature review. The documentation

process included collecting RTRW maps, land use images, and other documents supporting the research. While indirect observation was conducted through visual observation via Google Earth to understand the actual condition of agricultural land use. Data analysis was conducted using a comparative descriptive method, which included identifying agricultural areas according to the RTRW, describing the actual condition of land use, comparing the actual condition with regional spatial planning guidelines, and explaining the types of land use that were appropriate and had undergone changes. To ensure data validity, information was checked for conformity between the RTRW documents, images from Google Earth, and literature sources so that the research results could reflect the condition of agricultural land use in a structured manner.

## RESULT AND DISCUSSION

North Sangatta District is the center of government and economic activity in East Kutai Regency. Based on the spatial plan of East Kutai Regency, this area is dominated by residential areas, trade and services, mining, and other cultivated areas. The development of built-up areas in this region generally follows the main road network and community activity centers, thus forming a pattern of rapid urban development. This condition is also explained by (Mulyadi & Makhravie, 2023), who states that the dynamics of land use in East Kutai are influenced by the development of human activities and the increasing need for space.

Based on the interpretation of Google My Maps imagery, land use in North Sangatta District shows quite visible changes. Mining areas dominate the northern part of the region, with quite extensive open areas. Meanwhile, residential areas develop in the central part of the region, following main road access and community activity centers. Meanwhile, vegetative areas such as secondary forests, community gardens, and community cultivated land are still found in the eastern and northern parts of the region, which have not yet experienced intensive development.



These changes in land use indicate a relationship between urban development and mining activities (Abidin, 2023). Mining activities have resulted in a reduction in vegetation and an increase in non-forest open areas. This is consistent with research by (Rahman *et al.*, 2020), which explains that coal mining activities in East Kalimantan have led to increased rates of deforestation and land cover change. Furthermore, research by (Rahman *et al.*, 2020) also explains that increased mining activity and the development of built-up areas have led to significant changes in land use in several areas in East Kutai.

Agricultural land use in North Sangatta District generally consists of community gardens and small-scale community cultivation areas located on the outskirts of the city. Based on image interpretation, these areas still have fairly good vegetation cover and are used by the community for agricultural activities and small-scale plantations. The existence of community gardens indicates that the agricultural sector still plays a role in the community despite the increasing development of the region. Some community cultivation areas are located adjacent to forest areas and other open areas.

This condition indicates that some areas in North Sangatta District still have semi-rural land use characteristics. However, the development of residential areas has caused community cultivation space to begin to decrease due to the increasing need for land for development (Suryanto *et al.*, 2024).

The development of residential areas along main road corridors has led to the conversion of some agricultural areas into residential areas and urban support facilities. Aisyah (2025) states that the increasing need for space due to economic development and population growth has driven the conversion of cultivated land into built-up areas. Research by Andshani *et al.* (2024) also explains that urban development leads to an increase in built-up areas and a decrease in vegetative and agricultural land due to residential expansion and regional economic activity. In addition to residential development, mining activities also put pressure on the availability of agricultural land.

The development of mining areas in the northern part of the region has resulted in fragmented cultivated areas and reduced natural vegetation in the surrounding area (Andshani *et al.*, 2024). Mining activities not only change land use but also impact the environmental conditions surrounding cultivated areas. Research on post-mining land reclamation in East Kutai explains that mining activities can cause changes in soil conditions and a decline in environmental quality if not balanced with proper land management. Another study on the soil quality of reclamation areas in North Sangatta also

showed that post-mining land has a high level of soil acidity, requiring rehabilitation and sustainable environmental management to maintain the area's ecological function.

Agricultural areas surrounding mining activities are also potentially subject to environmental stress due to changes in land cover and the reduction of natural vegetation (Fauzan1 *et al.*, 2025). This condition aligns with research on the impact of mining on the environment in East Kutai, which states that changes in the landscape due to mining activities can affect the ecological balance of the surrounding area. The East Kutai Regency Spatial Plan (RTRW) directs agricultural cultivation areas to be located outside the center of urban development and mining areas. A comparison between the RTRW and actual land use indicates that some cultivated areas still align with spatial planning guidelines, particularly in the eastern and northern regions, which still have relatively good vegetation cover and have not been intensively developed.

However, there are several inconsistencies in spatial use in areas designated as cultivation areas in the RTRW but which have actually been developed into non-agricultural areas. Residential development and mining activities are the main factors influencing these land use changes. The increasing need for space due to population growth and economic development has caused some open land and cultivated areas to be converted into built-up areas.

This situation aligns with research findings (Mulyadi & Makhrawie, 2023), which show that land use changes in East Kutai are influenced by human activity and increasing regional development. Other research related to the dynamics of land cover change and carbon emissions in East Kutai Regency also explains that the conversion of vegetated land to built-up areas and mining areas has resulted in a decline in environmental quality and increased ecological pressure in the region. The remaining forest areas and community gardens serve a crucial role as environmental buffers in the region.

These areas play a role in maintaining ecological balance amidst intensive urban development and mining activities. Therefore, controlling spatial use is crucial to ensure the preservation of community cultivation areas, in accordance with the East Kutai Regency Spatial Plan (RTRW). Land use changes in North Sangatta District have a direct impact on the existence of community agricultural areas. The reduction in cultivation space has resulted in agricultural activities becoming increasingly limited and dispersed to specific locations. This situation has the potential to impact the sustainability of the local

agricultural sector if not balanced with more optimal spatial planning management. Mining activities also impact the environmental conditions surrounding cultivation areas.

Changes in land cover and reduced vegetation have led to a decline in the region's ecological function, particularly as a catchment area and environmental buffer. Research on the impacts of coal mining in East Kalimantan explains that changes in land cover due to mining activities can increase deforestation rates and affect the region's environmental balance. In general, land use dynamics in North Sangatta District indicate that regional development is quite rapid and complex. Therefore, spatial planning supervision and sustainable land use control are necessary to ensure that agricultural areas and community gardens are maintained in accordance with the East Kutai Regency Spatial Plan (RTRW).

### **SUGGESTION AND CONCLUSION**

Based on the research results, the evaluation of agricultural land utilization in North Sangatta District, East Kutai Regency, shows that there is a dynamic change in spatial layout that is quite significant due to the rapid development of the region. Although some cultivation areas in the east and north still maintain good vegetation cover and in accordance with the direction of the Regional Spatial Planning (RTRW), there is a mismatch in the use of space at several other points. Pressure from the expansion of residential areas that follow the main road corridor as well as intensive coal mining activities have converted some productive agricultural land and cultivation areas into non agricultural development land. This land function transfer has a direct impact on the increasingly limited and fragmented community farming space, as well as reducing the quality of the surrounding living environment. Therefore, it is necessary to have a strict spatial supervision and control of sustainable land use from the local government to maintain the preservation of the agricultural area and the ecological function of the area so that it remains in harmony with the RTRW direction that has been set.

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