Research Article Study of Regional Development Planning Towards Sustainable Development in Jember District, East Java, Indonesia

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Abstract: This study aims to identify priority sectors for regional development that support sustainable development in Jember Regency, as well as formulate spatial utilization strategies based on poverty criteria. The method used is the Analytical Hierarchy Process (AHP), which involves four main criteria, namely economic, environmental, regional spatial planning (RTRW), and socio-demographic aspects. Data were obtained from questionnaires distributed to stakeholders such as Bappeda, regional apparatus, academics, and the community. The results of the analysis show that the agricultural sector has the highest weight (0.269), followed by tourism (0.212), organizations (0.183), industry (0.169), and trade and services (0.168). These findings indicate that development must start from sectors that support basic needs and ecological sustainability, namely agriculture, which is also the backbone of the local economy and food security. Policy recommendations include strengthening spatial planning institutions, protecting agricultural land, developing ecotourism, sustainable housing, and empowering MSMEs and traditional markets. The results of this study are expected to be the basis for formulating balanced, participatory, and sustainable regional development policies by the principles of the Spatial Planning Law and Sustainable Development Goals.

Keywords: Analytical Hierarchy Process, Spatial Planning Policy, Sustainable Development.

1. Introduction

Sustainable regional development is a major challenge for local governments in realizing community welfare without sacrificing the environment and natural resources for future generations (Sugianto, 2025). Jember Regency, as one of the regions with abundant natural resource potential and quite rapid economic growth, faces various dynamics in regional development planning. Along with the increasing need for infrastructure, economic growth, and urbanization, Jember Regency must adopt a sustainable development approach to balance economic, social, and environmental aspects (Sugianto, 2023). Poorly planned development can cause various problems, such as environmental degradation, social inequality, massive conversion of agricultural land, and unequal access to public facilities. The Regional Spatial Plan (RTRW) is necessary to realize sustainable and targeted development.

RTRW can also help protect the environment and prevent misuse of space. However, there are still pros and cons in the ratification of RTRW in various regions, such as in Jember Regency which needs to revise the RTRW Perda because it is considered to have many shortcomings. Figure 1 shows the settlement center system in East Java Province which is the center of strategic activities for each district/city. Based on the settlement center system,

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Copyright: © 2025 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (https://creativecommons.org/li censes/by-sa/4.0/) the majority of regencies/cities in East Java are included in the Local Activity Center (PKL), which serves activities at the district/city scale and several sub-districts and is a node for social, cultural, economic, and administrative services for the community in the district area. Furthermore, Jember Regency is included in the Regional Activity Center (PKW), which is an urban area that serves activities at the provincial scale or several districts/cities and is part of the national urban system.



Figure 1. Settlement Center System in East Java Source: <u>https://sitr.jatimprov.go.id/webgis</u>, processed

Land use planning defines how land and space are used optimally and sustainably to achieve national and local goals. Planners reconcile competing interests in determining urban form and function, serving the public interest, and representing collective values in land use planning (Indrajit et al., 2021). For land management programs to be successful, the government needs to collaboratively provide information on Rights, Responsibilities, and Restrictions (RRR) obtained from land use planning to all stakeholders, including the government, landowners, and economic actors (Mattila & Heinilä, 2022). Based on the development of the East Java region, based on regional spatial planning, this study aims to analyze spatial planning in Jember Regency. The regency has unique characteristics, one of which is the richness of arts and culture, and has many tourist attractions and quite extensive agricultural and plantation land. In addition, it is also one of the most strategically important economic locations in Indonesia because it is passed by the main connecting route between Java and Bali. Thus, to increase national and regional economic development, Jember Regency has a development direction in plantation activities, conservation, trade, tourism, agriculture, settlements, and pioneer airports. The Medium-Term Regional Development Plan (RPJMD) of Jember Regency states that to encourage economic growth, infrastructure development must be carried out. Thus, infrastructure functions as capital to encourage economic activity in Jember Regency.

Various conflicts of interest have an impact on the sustainability of development. Conflicts of interest can come from the community, local government, regulatory bias, and investment management. In addition, there is minimal information related to the determination of sectors and regions within the spatial planning framework. Communication is an important element in the implementation of public policy, because through communication we can establish mutual understanding, understand each other, and know each other's information about a policy program that will be implemented by the government, what and how, who determines public policy (Bogdański, 2012; Rabiei-Dastjerdi et al., 2021).

Other problems in development related to RTRW are the deviation of spatial utilization and weaknesses in controlling spatial utilization, and the less-than-optimal function of spatial planning in harmonizing and integrating plans for sustainable development. This is related to the availability of resource aspects, namely quality human resources, sufficient infrastructure resources, and also financial support or budget. Spatial planning policies are determined by the Regent, whose members include the Regional Planning and Development Agency, the Regional Settlement and Infrastructure Service, the Legal and Organizational Section of the Regional Secretariat, the Civil Service Police Unit, the Licensing and Investment Service, and the Sub-district Head. Thus, the importance of the role of coordination is based on the fact that each employee and work unit in the organization has a specific task (specialization), but all are interrelated with each other to achieve organizational goals.

This research is also based on an empirical study that discusses regional spatial planning, which is a strategic issue in regional development. Kultsum (2023) explains the embodiment of the principle of sustainability in the process of preparing the Provincial RTRW and Regency/City RTRW by requiring local governments to prepare a Strategic Environmental Assessment (KLHS). Akbar et al. (2021) in their research also found several topics that have a strong relationship with regional development planning, namely decision making, decision support, land use, stakeholders, and coordination. Constraints and conflicts also often occur in the implementation of the RTRW, as explained by Dermawan et al. (2021) and Mediansyah (2023) that obstacles in the implementation of the Regional Spatial Planning Policy can come from target groups or communities, changes in government and the existence of a mismatch between the designation of the area and environmental characteristics. Mupepi et al., 2024) in their study recommend the implementation of resilience building interventions from an informed dimension, where specific resilience building initiatives are implemented in the right environment to obtain the desired results. Based on the previous explanation, this study aims to identify the implementation of spatial planning policies in the Jember Regency area, East Java Province, where each Regency included in the area has different regional characteristics and potentials. Thus, the differences related to regional planning can provide some supporting information in regional development nationally to be able to reduce the number of socio-economic disparities.

2. Research Methods

This research uses research that uses Mix approach, which has two quantitative and qualitative approaches that use two types of data to answer the formulation of the problem. Quantitative research is to find out the factors that influence the Implementation of the Regional Spatial Planning Plan by looking at the results of the analysis of the research hierarchy structure by considering several aspects. Furthermore, descriptive qualitative research wants to find out how the differences in the regional spatial planning and spatial utilization strategies of Jember Regency can create sustainable economic development and increase human capital. The data collected are in the form of secondary data and primary data. Primary data is data that is taken directly through field checks, interviews, and distributing questionnaires to experts, while secondary data is data obtained by a researcher not directly from the subject or object being studied, but through other parties. Secondary data comes from several related institutions, namely the Central Statistics Agency (BPS), Legislation, the Regional Financial and Asset Management Agency (BPKAD), the Regional Development Planning Agency (Bappeda), and other related sources.

The research method used is the Analytical Hierarchy Process (AHP), which is a technique used to evaluate and make multi-criteria decisions. AHP combines subjectivity and objectivity in the decision-making process and helps to find the most important factors in complex situations (Nezhad & Rezaei, 2015; Sadeghi & Ameli, 2012). Thomas L. Saaty, a professor of management science at the University of Pittsburgh, was the creator of the Analytical Hierarchy Process (AHP) method in the 1970s.

The Analytical Hierarchy Process (AHP) process consists of:

- a. Identify the problem to be solved and determine the purpose of the AHP process
- b. Identify the criteria needed to evaluate the available alternatives.
- c. Form a hierarchy of the identified criteria by placing the highest criteria at the top level and the smallest criteria at the bottom level.
- d. Pairwise comparison analysis is used to determine the relative weight of the identified criteria. This is done by asking respondents to compare two criteria on a certain scale.

The paired comparison scale and based on the intensity of importance and is as follows:

| Table I Fundamental Comparison Scale | | | | |
|--------------------------------------|---|---|--|--|
| 1 | = | Both elements are equally important. Two elements have the same | | |
| | | influence | | |
| 3 | = | One element is slightly more important than the other. Experience and | | |
| | | judgment slightly support one element over the other | | |
| 5 | = | One element is more important than the other. Experience and judgment | | |
| | | strongly support one element over the other | | |
| 7 | = | One element is clearly more absolutely important than the other, One | | |
| | | element is strongly supported and dominantly seen in practice | | |
| 9 | = | One element is more important than the other; evidence supporting one | | |
| | | element over the other has the highest level of confirmation that may | | |
| | | strengthen | | |
| 2,4,6,8 | = | Values between two values of adjacent considerations. This value is given | | |
| | | when there are two compromises between 2 choices | | |
| Reverse | = | If activity i gets one number compared to activity j, then j has the | | |
| | | opposite value compared to i | | |

 Determination of relative weight: Calculate the eigenvector of the pairwise comparison matrix to determine the relative weight of each criterion.

The priority weighted vector is calculated by the formula:

 $Aw = \lambda_{\max} w$,

w: priority weighted vector; λ_{max} : the largest eigenvalue in matrices A and w The consistency index of a matrix of order n can be obtained by the formula:

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

CI = Consistency index deviation ratio (consistency index), λ_{max} = The largest eigenvalue of a matrix of order n, n = Orde matriks

- 2. Determination of alternative scores by multiplying the relative weight of each criterion by the answers to the questionnaire for each alternative
- Decision making by comparing alternative scores to determine the alternative that best fits the identified criteria. The alternatives that are the objectives or objects of the decision are as follows:

| Table 2. Decision Alternatives | | | | |
|--------------------------------|--|--|--|--|
| Area | Description | | | |
| An agricultural | area for carrying out economic activities in the form of | | | |
| | farming, gardening, livestock, fish farming, and other | | | |
| | agricultural businesses | | | |
| An industry | area used for industrial activities, such as processing plants | | | |
| A residential | area where the population level and public facilities are | | | |
| The trade and services | area for trade activities, offices, and warehousing. | | | |
| Regional tourism | Regional tourism with natural resources that can attract | | | |
| - | visitors, both local and foreign tourists | | | |
| | | | | |

4. Verify and interpret the results obtained from the AHP and verify with other methods if necessary

The preparation of the criteria and sub-criteria for this study refers to several studies related to regional spatial management, such as (Kurniawati & Munir, 2017; Mao et al., 2024; Ramieri et al., 2024; Salsabila & Santosa, 2024; Shen, 2024; Stoeglehner & Abart-Heriszt, 2022).

Economic, environmental, institutional, and social & Demographic aspects are the criteria in this hierarchical structure because they have an influence on the implementation of spatial planning as stated in Law of the Republic of Indonesia Number 26 of 2007 concerning Spatial Planning that the implementation of regional spatial planning aims to realize a safe, comfortable, productive, and sustainable spatial planning in harmony, integration, protection of spatial functions, and prevention of negative impacts on the environment.

| Subcriteria |
|-------------------------------|
| Local Original Income (PAD) |
| Food Security |
| Investment Value |
| Infrastructure |
| Open Space Conservation Areas |
| Environmentally Friendly |
| |

Table 3 Criteria and Subcriteria

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|--------|-----|
|--------|-----|

| Criteria | Subcriteria |
|-----------------------|--|
| | Child Friendly |
| Institutional Aspects | Area development policies |
| | Related local institutions in the area |
| | National laws and regulations |
| Socio-demographic | Population Number |
| Aspects | Labor Absorption |
| | Disparities |

This study uses the Analytical Hierarchy Process (AHP) method to identify the most important factors in complex situations and aims to assist decision makers in solving complex problems. The decision-making in question is related to a case study on the implementation of the Regional Spatial Plan (RTRW) in Jember Regency to achieve holistic sustainable development, which means integrating economic, environmental, and social development in an integrated manner.



Figure 2. Research Hierarchy

3. Results Of Analysis And Discussion

Safe and orderly community conditions can increase regional competitiveness to attract investment and develop its various superior potentials. The basic principle of regional growth and development strategies by developing regional potential and investment is to accelerate the growth and economic development of the region concerned. This strategy must be implemented sustainably so that the regional government, central government, and community have a very important role in increasing or even increasing the economic capacity of the region. Investment is one of the supporting factors for the success of regional development. A higher labor absorption ratio will show how much capacity the investment project PMDN (Domestic Investment) and PMA (Foreign Investment) have to absorb labor in a region.



Figure 3. Strategic Areas of Jember Regency Source: (Source: <u>https://sitr.jatimprov.go.id/webgis</u>, processed)

The absorption of Jember Regency's workforce is dominant in the agricultural sector (BPS Provinsi Jawa Timur, 2023). This is also supported by the large amount of agricultural land in the Regency with various superior commodities such as rice, tobacco, and other agricultural products. This is also based on the analysis of the strategic area of Regional Regulation 10 of 2023 concerning the Provincial RTRW, where Jember Regency is mostly in an agricultural area. Figure 1.2 also illustrates that in addition to being included in the strategic area for agriculture, some are also large conservation areas, mining and energy areas, fisheries areas, production forest areas, and residential areas.

An important step in the long-term planning process is the issue of regional development and long-term strategic issues. This helps local governments identify opportunities and threats that may arise in the future. As is the case, industrial area development plans are based on the current development trends of industrial locations and their potential. This takes into account the availability of raw materials, labor, market demand, infrastructure availability, and regional development. Thus, good planning is planning that is carried out using accurate, valid, and accountable data and information. Jember Regency is one of the strategic areas in the eastern region of East Java Province, with an area of ±3,293.34 km² and consists of 31 sub-districts. Jember has a varied landscape ranging from coastal areas in the south, lowlands in the middle, to hills in the north and west. This spatial structure makes Jember have a very diverse regional potential, both in terms of economic, social, and environmental aspects. From an economic perspective, the agricultural sector is still the dominant sector that absorbs a lot of labor and supports the household economy, especially in rural areas. On the other hand, the small and medium industry (UMKM), trade and services, and tourism sectors are starting to develop in urban areas and leading destinations such as Papuma Beach, Puger, and agrotourism areas. Based on a sociodemographic perspective, Jember Regency faces challenges such as urbanization, disparities in development between regions, and increasing needs for basic services. In the environmental context, issues such as land degradation, conversion of green open spaces, floods, and landslides are important concerns in the preparation of sustainable development policies.

Data processing using the AHP method using the Expert Choice Application, the average output results of the weight and ranking of alternatives for holistic sustainable development from the AHP calculation are obtained based on the results of interviews with sources who know information about sustainable development with a regional governance perspective in Jember Regency. The results of the weighting between sub-criteria are presented in Figure 4 based on the results of interviews and questionnaires from 8 respondents consisting of Bappeda, the Environmental Service (DLH), the Public Works, Highways and Resources Service (DPUBM), the Public Housing, Settlement Areas and Cipta Karya Service (DPRPCK), Academics who are experts in the field of development planning economics, Academics who are experts in the field of regional economics, the general public who are engaged in the property sector and the public who are engaged in tourism. Based on the combination of expert preference results consisting of 8 respondents, an inconsistency value of 0.08 was obtained, which means that the calculations carried out are acceptable because, according to Saaty, $CR \le 0.1$, the value is considered consistent.

The main priority in holistic sustainable development is the institutional aspect in determining land management in Jember Regency, which consists of sub-criteria with a percentage of regional development policies (14%), local institutions related to the area (13.3%), and national legislation (9.3%). The main priority relates to the rules of national and regional policy directions that prioritize community welfare, especially in the management of district spatial planning. Government Regulation Number 21 of 2021 concerning the Implementation of Spatial Planning, which regulates the planning, utilization, control, supervision, and development of spatial planning, as well as spatial planning institutions, is one of the bases for managing the space. Thus, there needs to be strong synergy between spatial planning institutions, which can consist of the central government (Ministry of ATR/BPN, Ministry of PUPR, Ministry of Environment and Forestry), Provincial/District/City Regional Governments (Bappeda, Spatial Planning Service), Academics, and the community.

The role of spatial planning institutions is to carry out spatial planning, spatial utilization, control of spatial utilization, guidance and supervision, as well as synchronization and coordination of various parties. Spatial planning can run effectively and efficiently if supported by good institutional performance, so that it is beneficial for sustainable development in the region. Thus, experts argue that the Institutional Aspect is the main priority in achieving holistic sustainable development goals.

The next aspect that is a priority is the environmental and economic aspects. The priority environmental aspect sub-criterion is the conservation area (7.6%), which means that land use must not damage the conservation area. Meanwhile, the priority economic aspect sub-criterion is infrastructure, which means that land use must increase the efficiency and effectiveness of infrastructure use. The sub-criterion that has the lowest weighting value is the PAD Economic Aspect, which means increasing local revenue through spatial management is the final priority because, for the expert, the main spatial management can provide security and comfort and reduce disparities between regions. Thus, the AHP results show that holistic sustainable development is prioritized through an institutional approach (regulation, local capacity, and regional policies), followed by environmental and social aspects, with economic aspects as supporting factors.

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Based on the results of the weighting between alternatives, the Overall Inconsistency Value = 0.07, meaning that the results of the comparison between criteria in AHP are still acceptable, because the value is <0.1 (according to Thomas L. Saaty, the inconsistency ratio (CR) value <0.1 indicates acceptable consistency). Figure 5 explains that the Expert believes that in achieving holistic sustainable development with a spatial governance approach, the main alternative is to make Jember Regency an agricultural area. Agricultural areas have the highest weight (0.269) compared to other sectors (tourism, settlements, industry, trade, and services). Therefore, agricultural areas are the main alternative; spatial management must be able to allocate and protect productive agricultural land, avoid the conversion of agricultural land to non-agricultural land, and also determine protected areas and agricultural cultivation strictly according to the principle of environmental carrying capacity. This statement is also based on Law No. 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land (PLP2B).





Figure 5. AHP Results of Weighting Between Alternatives Source: processed by researchers, 2025

The second ranked alternative in the AHP results is the tourism area with a weight of 0.212, indicating that this sector has a significant contribution to holistic sustainable development goals, although it is still below the agricultural area. This result is also based on data from the Jember Regency Tourism Office that Jember Regency has 65 tourist objects spread across all sub-districts in Jember Regency (Badan Pusat Statistik Kabupaten Jember,

2021). The tourism area is an alternative for regional development because it has the potential to drive the local economy, such as the growth of MSMEs, and is also able to create inclusive jobs. Efficient utilization of regional space, especially tourism areas, does not require large-scale conversion because Jember Regency itself has high natural, cultural, or historical potential that can be optimized into a tourism zone.

The third alternative in the AHP results is the residential area with a weight of 0.183, which means that this sector also plays an important role in supporting holistic sustainable development, although not as important as agricultural and tourism areas. Settlements are a basic human need guaranteed by the state. Good management of residential areas can fulfill the right to decent housing (constitution and human rights), provide access to basic infrastructure (clean water, sanitation, energy, and transportation), and also support the quality of life of the community. The Jember Regency Government, through the Public Housing, Residential Areas, and Public Works Service (DPRKPCK), is actively involved in the planning and management of residential areas. Some of the activities carried out include the preparation of the Regional Spatial Plan (RTRW), coastal area planning, and the implementation of the rehabilitation program for uninhabitable houses (RTLH).

In the results of the Analytic Hierarchy Process (AHP), the industrial area is ranked fourth with a weight of 0.174. Although not a top priority, this sector has a strategic role in supporting sustainable development in Jember Regency. The development of integrated industrial areas that integrate the agricultural, processing, and distribution sectors can increase efficiency and productivity. In the results of the Analytic Hierarchy Process (AHP), trade and services are ranked fifth (last) with a weight of 0.168. Although in last place, this sector remains important in supporting holistic sustainable development, especially as an economic driver and a link between sectors. Trade activities trigger the development of new growth centers.

Based on the AHP results above, the policy implications are strengthening the agricultural sector with the support of agrarian policies, local food security, and environmental conservation. Local governments can issue agricultural land protection policies through the LP2B (Sustainable Food Agricultural Land) Regional Regulation, provide organic fertilizer subsidies, and develop local seed banks. In addition, the integration of environmentally friendly agriculture, such as agroforestry, can be applied to prevent land degradation. Green-based industry as a strategy to increase economic competitiveness without sacrificing the environment. Jember Regency Government can encourage UMKM agricultural processing industries using renewable energy (such as biogas from livestock waste), incentives for industry players who implement ISO 14001, and the development of environmentally friendly industrial areas (eco-industrial parks) in strategic areas. Settlement arrangement based on RTRW to create decent, safe, and sustainable settlement areas. Arrangement of densely populated settlement areas through participatory relocation programs to locations in accordance with RTRW, construction of livable houses through collaboration between the government and the private sector, and provision of basic infrastructure. Optimization of the tourism and service sectors while still paying attention to environmental carrying capacity and social justice (Catudan, 2016; Sharma, 2020). Development of local culture-based tourism villages with community involvement as the main actors, restrictions on the number of tourists in ecologically vulnerable areas (such as

beaches or mountains), and the application of environmental contribution rates (environmental fees) for tourists entering conservation areas.

4. Conclusion

Institutional approaches have proven to be the main key in realizing holistic sustainable development, reflected in the high priority given to regional policies, local institutions, and regulations. Environmental aspects occupy a middle position, indicating the important role of conservation and open space as an ecological foundation. Meanwhile, economic aspects such as investment and infrastructure function as catalysts but have not yet become the main focus. Social aspects, including reducing inequality and attention to vulnerable groups, act as supporting elements that maintain inclusion and justice. To strengthen the direction of development, cross-institutional coordination, active community involvement, increased environmental awareness, and synergy between sectors are needed to create integrated and sustainable spatial utilization.

The government needs to prioritize the agricultural sector as the spearhead of sustainable development, considering its strategic role in maintaining food security, preserving the environment, and driving the local and rural economy (score 0.269). In second place, the government can develop the tourism sector (0.212), which has great potential to generate foreign exchange, create jobs, and encourage cultural and environmental preservation, as long as its development is carried out sustainably. Furthermore, the government must also organize residential areas (0.183) to be more environmentally friendly, inclusive, and able to improve the quality of life of the community. In the industrial sector (0.169), the government can encourage the creation of economic added value and structural transformation through the development of industries based on local potential that are integrated with the agricultural sector. In the trade and services sector (0.168), the government plays a role in strengthening the distribution of production results, providing public services, and improving the regional economy, although this sector is still very dependent on other productive sectors. Thus, the government must formulate sustainable development policies holistically, starting from strengthening the agricultural sector to developing other sectors in an integrated, inclusive, and environmentally friendly manner.

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