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Article

Accelerating spatial planning in Indonesia: Critical points and improvement initiatives for detailed spatial plan

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Abstract: The policy to accelerate the design of the Detailed Spatial Plan regulation document (RDTR) is a strategic step to enhance ease of doing business and promote sustainable development in Indonesia. Targeting 2036 RDTR sites nationwide, the initiative relies on various policy interventions and technical approaches. However, as of 8 January 2024, only 399 RDTRs (19.59%) were enacted after four years of implementation. This underperformance suggests the need to examine factors influencing the process, including issues at each stage of the RDTR design business process. While often overlooked due to its perceived irrelevance to the core substance of planning, analyzing the process is crucial to addressing operational and procedural challenges. This research identifies critical issues arising from the preparation to the enactment stage of RDTR regulations and proposes necessary policy changes. Using an explanatory approach, the study employs methods such as Analytic Hierarchy Process (AHP), post-review analysis, stakeholder analysis, business process evaluation, and scenario planning. Results show several impediments, including challenges related to commitment, technical and substantive issues, managerial coordination, policy frameworks, ICT support, and data availability. These findings serve as inputs for the development of business process improvement scenarios and reengineering schemes based on Business Process Management principles.

Keywords: spatial planning; RDTR; business process improvement; policy development; scenario planning

1. Introduction

Spatial planning documents are strategic policy instruments that align long-term, medium-term, and annual development plans with Indonesia's development planning law. Rustiadi et al. (2021) identify three goals for spatial planning: Economic, environmental, and social, with economic objectives emphasized in Indonesia's current policies. However, challenges remain in using spatial planning as a cohesive tool to integrate development programs (Holden, 2008; Sari et al., 2022), which require robust institutional arrangements and cultural adaptation (Enemark, 2006; Hudalah and Woltjer, 2007).

Effective spatial planning plays a crucial role in facilitating control measures that prevent the misuse of spatial resources (Stephany, 2021), which may include the steps taken by the Government of Indonesia to simplify business procedures and accelerate investment, as seen in Presidential Instruction No. 7 of 2019. Data from the World Bank shows that the construction permit process in Indonesia requires 18 procedures and an average of 200 days (World Bank, 2020). The Doing Business indicators were discontinued by the World Bank in 2021 due to concerns about data integrity, nevertheless the assessment from the 2020 report remains relevant for understanding the investment climate in Indonesia. The World Bank continues to cover the investment environment with the new B-Ready indicators, especially in the business entry topic (World Bank, 2024). In addition, the World Economic Forum (WEF) has identified 16 characteristics that inhibit investment in Indonesia through its Global Competitiveness Index (GCI) report (World Economic Forum, 2020). The KPPOD study (2016) also found that local governments' slow responses have hindered the complete realization of business ease.

By the end of 2020, the government of Indonesia enacted the Job Creation Law (Undang-Undang Cipta Kerja, UUCK) as an omnibus law to reform multiple sectors, including agrarian affairs, land, and spatial planning. The reform introduced the role of Detailed Spatial Plan (RDTR) as a key instrument for facilitating investment and development. Various forms of location permit are transformed into one standardized permit in Online Single Submission (OSS) system, namely spatial use suitability (KKPR), which operates more effectively in areas with Detailed Spatial Plans (RDTR) regulated. The RDTR design acceleration program is launched to support the reform. RDTR at a scale of 1:5000 in 2036 locations are targeted through Ministerial Regulation No. 27 of 2020. These RDTR aim to stimulate economic growth, create jobs (Ratih et al., 2023), and support bureaucratic reform.

The RDTR acceleration program addresses the needs for land management practices that align the principles of robustness, responsiveness, and retraceability within the 8R framework proposed by de Vries and Rudiarto (2023). Legal robustness, as the first prerequisite to ensure responsible land interventions (de Vries and Rudiarto, 2023), requires clear forest area boundaries to reduce tenure uncertainty. The RDTR design process involves collaboration across various sectors, including forestry, which can play a role in addressing the challenges of unclear forest demarcations (Bennett et al., 2023) effectively. Responsiveness calls for land management practices to include the needs and long-term perspectives of stakeholders (de Vries and Rudiarto, 2023), which is addressed by mandatory public consultation in the RDTR design process. Retraceability ensures each step in the design process is documented, enhancing accountability. Furthermore, the enacted spatial plans form a foundation for issuing spatial use permits, as mandated by Minister of Agrarian Affair and Spatial Planning/National Land Agency (ATR/BPN) Regulation No. 13 of 2021, ensuring documented land management practices.

After four years of implementation, only 399 RDTRs, or 19.59% of the target, have been completed. To address this, the Ministry ATR/BPN has introduced interventions to push the program further such as improving regulations, providing budget assistance, simplifying processes, and enhancing human resources. However, these efforts have yielded limited results. This underperformance could be caused by inefficiencies in business processes rather than planning substances. A thorough review of these processes is essential to identify bottlenecks and implement optimization or radical reengineering where needed (Dumas et al., 2013; Weske, 2007). Moreover, efforts to accelerate spatial plan preparation must focus on optimizing roles, streamlining data flows, and enhancing public participation through digital platforms and spatial database management systems (SDBMS). These tools can facilitate automated spatial analysis, reduce subjectivity, and improve efficiency. The development of Indonesia's new capital city (IKN) has demonstrated the feasibility of accelerating RDTR designs, with nine RDTR in IKN area enacted in 2023, within one year time frame following Law No. 3 of 2022. Unlike local-level plans, these are managed at the national level, providing a reference model for accelerating spatial planning in regencies and cities. This research aims to identify and address critical points in the business process of RDTR design, from the planning stage to the enactment of the RDTR, to support the policy of accelerating RDTR design process.

2. Theoretical perspective

2.1. Spatial planning

Spatial planning is a multifaceted discipline that integrates various interrelated fields to shape the future (Byrne, 2003; Rustiadi et al., 2021). Spatial planning theory is dynamic, evolving through diverse backgrounds, logics, socio-political conditions, and social movements (Rustiadi et al., 2021). Allmendinger (2002) identifies seven frameworks for spatial planning theory: (1) Systems and Rational Planning; (2) Marxist and Critical Theory; (3) New Right Planning; (4) Pragmatism; (5) Advocacy Planning; (6) Postmodern Planning; and (7) Collaborative Planning. Applying these theories requires professional dialogue and public participation (Alfasi and Portugali, 2007). In addition to theory, a country's institutional and legal frameworks, policy instruments, and land use activities collectively form its unique spatial planning system (Acheampong, 2019).

Spatial Planning is analyzed within substantive and procedural theories. Substantive theories address the plan's objectives, while procedural theories focus on the planning process (Faludi, 1973). The content of spatial plans typically includes economic, conservation, and social dimensions. In Indonesia, the development of spatial plans aims to integrate cross-sectoral demands, shifting from a physical focus to a comprehensive, participatory, and collaborative approach (Rustiadi et al., 2021).

The ideal planning process starts by defining goals and exploring strategies to achieve them (Faludi, 1973). Public involvement is critical to ensure legitimacy, prevent mis prioritization, and address conflicts informed by local knowledge (Laurian, 2009; Legacy, 2012; Rustiadi et al., 2021). Diversity within modern society must be recognized (Holgersen and Haarstad, 2009), emphasizing inclusive collaboration to improve government decision-making (UN Habitat, 2023).

The design of RDTR involves multiple stakeholders through public consultations and cross-sectoral discussions. Knowledge-sharing among actors improves policy quality (Holden, 2008; Sahin, 2019; Taufiq et al., 2021), while public trust in participatory planning is important for achieving objectives (Laurian, 2009). Effective spatial planning requires integrating stakeholder contributions, including local knowledge (Villanueva et al., 2017). Precipitous development without collaboration risks reducing planning to a technical exercise, leading to suboptimal outcomes (Elbakidze et al., 2015). Healey (1997) recommends that in fragmented pluralistic societies, collaborative planning fosters transformative learning, balancing diverse interests through formal and informal knowledge sources.

The collaborative framework positions planners as mediators to harmonize stakeholder interests and ensure well-legitimized spatial plans (Kitchen, 2006). This method is particularly suitable for implementing policies to accelerate RDTR design. The Regulation of the Minister ATR/BPN No. 11 of 2021 outlines seven stages in Indonesia's RDTR design process:

1) Determination of Detailed Spatial Plan location.
2) Preliminaries, including establishing a working framework, determining methodology, and picking out the area of interest.
3) Primary and secondary data collection, including data on administrative areas, population, land tenure, disasters, and basic maps and thematic maps as needed.
4) Processing and analyzing 21 types of data.
5) Formulation and refinement of planning concepts.
6) RDTR legal drafting as well as the preparation of the policy study regarding the Local Government Regulation on Detailed Spatial Planning.
7) RDTR substantive approval from Ministry of ATR/BPN.

2.2. Scenario planning and Analytic Hierarchy Process (AHP)

Scenario planning as a management tool for strategic planning by detecting conditions of organizational uncertainty (Ringland, 1998), using a structured analysis process that combines strategic analysis with creative and intuitive thinking, and designing various future scenarios by taking action in the present (Cordova-Pozo and Rouwette, 2023; Oliver, 2023). Scenario planning is a systematic approach to addressing complex challenges requiring both systematic and systemic thinking (Bandhold and Lindgren, 2003). Lindgren and Bandhold divide the steps involved in scenario planning into TAIDA framework (Tracking, Analyzing, Imaging, Deciding, and Acting). This approach was chosen for this research as it effectively addresses the uncertainty present in spatial plan design, enabling timely and appropriate responses to meet targets. As uncertainty is inherent in any exploration of future possibilities, it serves as the foundation for scenario planning. Without uncertainty, there would be no reason to explore different future worlds. The process acknowledges that understanding and navigating uncertainties is key to designing effective spatial plans. The scenario planning output helps engineer a logical business process scheme. OMD (UK) used scenario planning to explore uncertainties about content monetization and video regulation for YouTube (Oliver, 2023). Scenario planning has been widely used and developed into three schools of method, namely 1) intuitive logics; 2) probabilistic modified trends (PMT); and 3) the French approach of La prospective (Amer et al., 2013).

To enhance scenario planning at its initial stage, the Analytic Hierarchy Process (AHP) method can be used to identify and weigh factors influencing the business process of spatial plan design. AHP simplifies complex decision-making by breaking it into smaller, structured components. The advantages of the method include handling multi-objective problems with multiple criteria, flexibility in assigning priorities, and accuracy in determining the highest value. In this study, AHP is used to evaluate and prioritize factors critical to accelerating the RDTR design process.

AHP works with three main principles (Saaty, 2008): Hierarchical decomposition, comparative judgment, and logical consistency. The hierarchy represents different problem levels, starting from the main goal, first-level criteria, sub-criteria, and alternatives. AHP allows users to intuitively assign relative weights of 1–9 to a complex criterion, to provide an assessment of a pairwise comparison using eigenvalues and eigenvectors. Saaty in Ishizaka and Labib (2009), argues that these values will be reasonable if they come from a consistent or nearly consistent matrix. The greater the inconsistency ratio of the matrix, the more inconsistent the assessment. The analysis is considered valid if the inconsistency ratio is not bigger than 0.1 (Forman and Selly, 2001).

AHP has been widely applied across various fields. For instance, it has been used with GIS to locate suitable airport sites in Libya (Elsharida and Erkan, 2020) and to develop an environmental vulnerability index for coastal areas (Bagheri et al., 2021). In the photovoltaic (PV) energy sector, AHP has prioritized factors for sustainable supply chains and site selection (Mastrocinque et al., 2020).

2.3. Business Process Management (BPM) and Business Process Improvement (BPI)

Business Process Management (BPM) is a discipline focused on managing and optimizing processes through technology, automation, and continuous improvement (Weske, 2007). Dumas et al. (2013) defines BPM as an approach that employs methods, techniques, and tools to discover, analyze, redesign, execute, and monitor business processes. BPM is not just a process to aim automation but a way to further improve these processes (Mahendrawathi, 2018).

The growing accessibility of machine learning has reduced the resources required to implement and maintain spatial planning decision support systems, making these systems more feasible for decision-makers (Li and Wen, 2023). For instance, Bui et al. (2023) demonstrated an automation method for land cover classification in Vietnam with high accuracy. While often overlooked, improving business processes is essential to meet demands for standardization, innovation, and operational efficiency.

Business Process Reengineering (BPR) seeks to radically overhaul and improve existing processes to achieve significant performance gains, particularly in effectiveness and efficiency (Weske, 2007). In the public service sector, process maturity positively impacts effectiveness (Klein et al., 2023), whereas an unclear division of tasks among actors can reduce both effectiveness and efficiency (Kasim et al., 2018; Ksenofontov et al., 2019). Effectiveness covers costs, resource usage and waste, and value generation (Kasim et al., 2018), while efficiency relates to the optimal use of resources (Ksenofontov et al., 2019).

This research focuses on reengineering business processes to accelerate the design of RDTR. Harrington (1991) describes Business Process Improvement (BPI) as a strategy to maximize process effectiveness and deliver the highest benefits to stakeholders. The three main objectives of BPI are: 1) Making processes effective and productive; 2) optimizing resource use for efficiency; and 3) making processes versatile. BPI helps organizations streamline workflows, address weaknesses, and build resilience for future challenges. These insights can be used for the development of effective spatial planning policies to expedite the design process.

3. Materials and methods

This research is categorized as policy development research, which in terms of its objectives is classified as explanatory research, utilizing both quantitative and qualitative data analysis.

3.1. Materials

The primary data for this research includes questionnaire responses collected to analyze factors influencing RDTR design acceleration and for post-review analysis. 80 responses were collected on factors affecting RDTR acceleration, with 20 respondents each from the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN), academic institutions (ASPI), the Indonesian Planner Association (IAP), and Local Government Spatial Planning Apparatus. For the post-review analysis, 169 samples were collected from 127 Local Governments. Among the 169 samples, 113 samples are for RDTRs designed prior to the Job Creation Law (UUCK), 49 samples are for those designed afterward, and 7 samples were excluded due to incomplete data.

Secondary data, obtained through a desk study, included reviews of relevant regulations, official documents, reports, academic journals, statistical data, and documentation of best practices from prior research.

3.2. Methods

Secondary data was collected from various relevant ministries and local governments. Meanwhile, primary data in this research was collected from distributing questionnaires, interviews, and Focus Group Discussions (FGDs) with experts and stakeholders. The questionnaire distribution was conducted in two phases:

1) The questionnaires to identify factors influencing the acceleration of Detailed Spatial Planning (RDTR) design process, were conducted for 73-day period, from 16 May 2023 to 27 June 2023;
2) The post-review questionnaire distribution was conducted online and offline over 74 days, from May 16, 2023, to July 28, 2023.

This research uses scenario planning with TAIDA (Tracking, Analyzing, Imaging, Deciding, Acting) framework as the holistic method to develop a new policy model aimed at accelerating the design of RDTR. The Tracking step began with finding influence factors and post-review policy comparison to identify problems hindering the acceleration of the RDTR design process.

Primary data from the first phase was analyzed with the Analytic Hierarchy Process (AHP) method and an FGD in determining and assigning importance to factors that contribute to the acceleration of the RDTR design process. This analysis led to the formulation of the Readiness Criteria Index (RCI). The AHP hierarchy was structured based on the factors and subfactors obtained from the desk study on the Regulation of the Minister ATR/BPN Number 11 of 2021 and the empirical impediments faced by the Local Government in designing the RDTR.

In AHP, eigenvalues and eigenvectors are calculated from pairwise comparison. Ishizaka and Labib (2009) annotated the comparison between i and j as *pi*/*pj* to be multiplied by priority vector *p* (Santo et al., 2024a) (see **Figure 1**):

$$\begin{bmatrix} p_1/p_1 & p_1/p_2 & \cdots & p_1/p_n \\ p_2/p_1 & p_2/p_2 & \cdots & p_2/p_n \\ \cdots & \cdots & \cdots & \cdots \\ p_n/p_1 & p_n/p_2 & \cdots & p_n/p_n \end{bmatrix} \begin{bmatrix} p_1 \\ p_2 \\ \cdots \\ p_n \end{bmatrix} = n \begin{bmatrix} p_1 \\ p_2 \\ \cdots \\ p_n \end{bmatrix}$$

Figure 1. An eigenvector formulation.

or it can be written as follows:

$$A\vec{p} = n\vec{p} \tag{1}$$

where *p* represents priority vector, n is the matrix dimension, and A represents the comparison matrix. Since priorities are meaningful only when derived from consistent or nearly consistent matrices, it’s necessary to conduct a consistency check. Saaty (1977) introduced a consistency index (*CI*) that is linked to the eigenvalue method for this purpose.

$$CI = \frac{\lambda_{max} - n}{n - 1} \tag{2}$$

where λ_{max} is the maximum eigenvalue.

Consistency Ratio, the ratio between *CI* and *RI* is defined as follows

$$CR = \frac{CI}{RI} \tag{3}$$

where *RI* is the random index (the average CI of 500 matrices filled randomly).

This analysis led to the priority weights of factors and subfactors. After conducting a consistency test, the results are presented and discussed with representatives from respondent groups in a Focus Group Discussion (FGD), to explore the dynamics of the influencing factors along with the mitigation methods and to formulate Readiness Criteria Index (RCI).

The second survey design was developed to explore and compare the RDTR design process between prior and post Job Creation Law (UUCK), covering the stages of preparation, implementation, and legislation, in accordance with the Regulation of the Minister ATR/BPN Number 11 of 2021. As a post-review survey, the second questionnaire includes administrative, technical, and substantive aspects: a) RDTR design process; b) Involvement of community roles in RDTR design; c) Discussion of the RDTR draft; d) Evaluation of the time; and e) Suggestions and critics. After being classified into the prior UUCK cluster and the post UUCK cluster, the collected questionnaire data with a Likert scale ranging from 1 to 5 was processed using IBM SPSS Statistics 23 software to conduct validity tests, reliability tests, and descriptive statistical analyses to identify common impediments (mode).

The Analyzing step involves policy analysis, stakeholder analysis, and business process analysis to evaluate the effectiveness of existing policies in accelerating RDTR design. Policy analysis examined the implementation of relevant laws and regulations, including spatial planning laws and technical guidelines. Stakeholder analysis utilized Social Network Analysis (SNA) and Organizational Network Analysis (ONA) to map interactions, roles, and collaboration among actors and organizations in the RDTR design process.

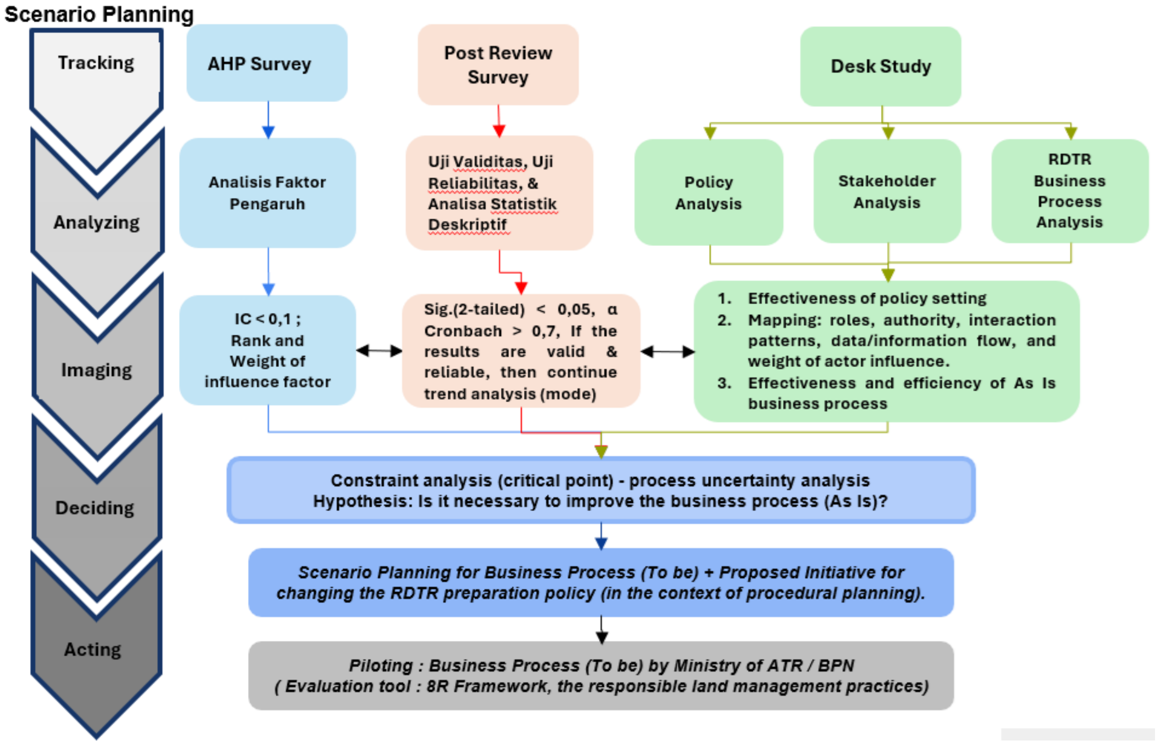

Figure 2. Illustration of methods.

(Own study).

The analysis of existing business processes (“as is”) evaluated current workflows and outputs, using the Business Process Modelling and Notation (BPMN) method for assessment.

The imaging step involves formulating hypotheses by comparison using the Business Process Management approach between the output of the tracking to analyzing stage and the result of theoretical study and empirical study. This hypothesis will be discussed with the scenario planning team, who will also review the relevant best practices that can be adopted to optimize the RDTR design process.

In the Deciding step, researchers and the scenario planning team develop various logical and feasible scenarios for future implementation. The outcome of this Deciding stage is the engineered business process (to be) as seen **Figure 2**. After identifying the best alternative scenario recommendations, the researchers will provide policy input based on their findings to the Ministry of ATR/BPN for the implementation of the selected best scenario as part of the Acting phase.

4. Results and discussion

4.1. The influencing factors of the acceleration of RDTR design and readiness criteria index

The impediments to RDTR design compiled by the Directorate General of Spatial Planning, Ministry of Agrarian Affair and Spatial Planning, Indonesia (Direktorat Jenderal Tata Ruang, 2021) are structured into the factors and sub-factors that influence the acceleration of RDTR design as shown in **Figure 3**.

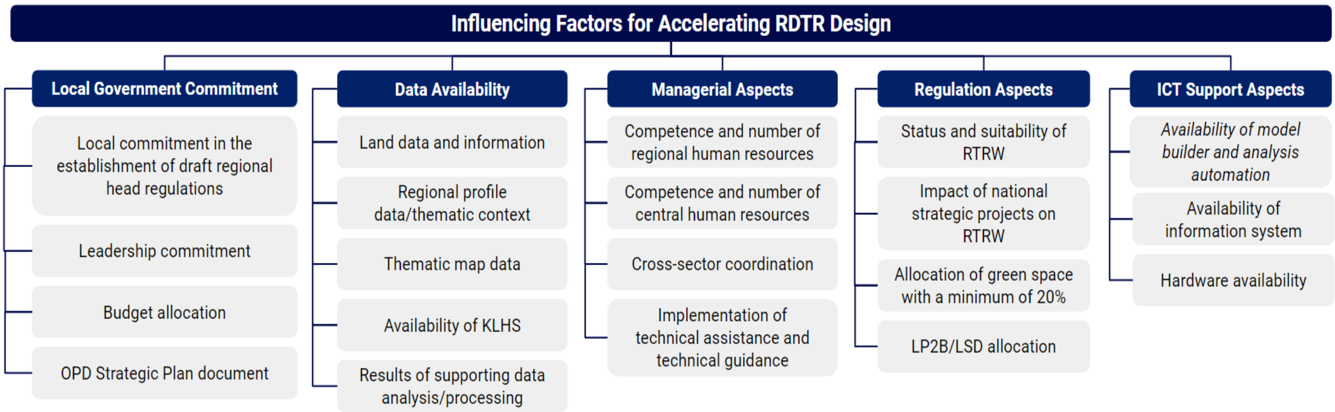

Figure 3. Hierarchy of factors Influencing the acceleration of RDTR design (Santo et al., 2024b).

The factors and subfactors were then ranked using AHP method. The collected AHP questionnaires were processed using Expert Choice 11 software to test consistency and determine the weights of factors influencing the acceleration of RDTR preparation. The results of the analysis showed that the inconsistency ratio for each factor, for each respondent group, and overall was below 0.02 (Santo et al., 2024a), which indicates that the results of pairwise comparisons are valid, consistent, and acceptable on the basis that the value of the inconsistency ratio should not be greater than or equal to 0.1 (Forman and Selly, 2001).

The AHP ranking results showed that although there were some differences in ranking between respondent groups at the subfactor level, all respondent groups agreed that local government commitment was the main factor influencing the acceleration of RDTR design, with an aggregate weight of 35.30% (Santo et al., 2024a). At the subfactor level, local government commitment in enacting local government regulations was also identified as the most influential subfactor. This finding is in line with Norton's (2005) research that emphasizes local commitment and capacity as one of the important things that have a positive influence on plan quality. The aggregate results of the ranking at the subfactor level are as follows:

1) Local commitment in the design process of draft regent / mayor regulations (11.40%);
2) Leadership commitment (9.60%);
3) Budget allocation (9.50%);
4) Land data and information (7.20%);
5) Competence and number of regional human resources (5.80%);
6) Cross-sector coordination (5.30%);
7) Status and suitability of regional spatial plans (5.30%);
8) Regional profile data/thematic context (5.20%);

9) Local Government Strategic Plan document (4.90%);
10) Thematic map data (4.90%);
11) Availability of Strategic Environmental Assessment (KLHS) (4.70%);
12) Results of supporting data analysis/processing (4.60%);
13) Implementation of technical assistance and technical guidance (4.30%);
14) Impact of national projects on regional spatial plans (3.10%);
15) Competence and number of central human resources (2.80%);
16) Allocation of green space with a minimum of 20% (2.70%);
17) Availability of model builder and analysis automation (2.60%);
18) Protected Agriculture Land (LP2B/LSD) allocation (2.40%);
19) Availability of information system (2.40%);
20) Hardware availability (1.20%).

The results of the analysis of factor and subfactor weights were discussed in a Focus Group Discussion (FGD) with respondent representatives, to develop the Readiness Criteria Index (RCI), a composite index calculated based on AHP weights. Santo et al. (2024a) formulated the RCI by eliminating AHP-derived subfactors that did not affect the RDTR site planning process and re-weighting the remaining subfactors. After elimination, the 5 factors and 20 subfactors of influence were set to be the 5 criteria and 13 sub-criteria of RDTR design readiness. Leadership commitment, budget allocation, and land information data were the sub-criteria with the highest weights in the RCI assessment.

RCI measurement is intended for self-assessment óf local governments based on data analysis, including identification of impediments to RDTR design. The RCI scores indicate the readiness level of local governments to start the RDTR design process.

4.2. Post-review analysis

The result of the validity and reliability test from the post-review questionnaire is shown in **Table 1**. The test was carried out to see how the research questionnaire consistently produces the same results under identical conditions on repeated occasions.

Table 1. Results of validity and reliability test.

Activity	Before UU CK		After UU CK		Remarks
	Sig. Value	Crombach's Alpha Value	Sig. Value	Crombach's Alpha Value	
RDTR Preparation Stage	0.0000	0.733	0.0000–0.0001	0.707	Valid and reliable
Data and information collection stage	0.0000	0.749	0.000–0.005	0.751	Valid and reliable
Data processing and analysis stage	0.0000–0.019	0.754	0.000–0.003	0.751	Valid and reliable
Participatory public stage	0.0000	0.777	0.000	0.775	Valid and reliable
RDTR draft discussion	0.0000	0.865	0.000	0.879	Valid and reliable
Technical and substantive compliance	0.0000–0.001	0.906	0.000–0.036	0.929	Valid and reliable
Administrative compliance	0.0000–0.007	0.770	0.000–0.001	0.952	Valid and reliable

(Own study).

All stages assessed in this post-review questionnaire were declared "valid and reliable", so they can be interpreted further. The questionnaire results were then analyzed using descriptive statistics to find the highest frequency value or mode to see the trend of impediments that occurred in the field.

The results of the post-review survey showed that in general there was no significant difference in the quality or completion time of the RDTR design either before or after the Job Creation Law (UUCK), including the impediments that are already found before the UUCK came into effect and continued to occur after the implementation of UUCK (Santo et al., 2024b).

In the substantive aspect, several activities after the UUCK received the most frequent scores of not good or very bad, namely: 1) Data collection by intern students (MBKM); 2) Public participation through mass media (television, radio, newspapers, magazines); 3) Public participation through the official websites of government agencies; 4) Public participation through open letters in the mass media.

In terms of technical and substantive completeness in the context of substantive approval, several activities were found after the UUCK received the most frequent score of not good with a time description value of 1–3 months or more, namely: 1) Legal draft on RDTR and attachments; 2) Technical material consisting of data analysis and map book; 3) Legal draft map in digital format; 4) Base map recommendations issued by BIG; 5) Validation of Strategic Environmental Assessment (KLHS) documents. Regarding the base map, at the moment, BIG is not yet able to supply all the necessary base maps, local governments have the option to create their own base maps (Rachmawati et al., 2024).

In terms of administrative completeness, several activities were found after the UUCK received the most frequent score of not good with a time description value of 1–3 months or more, namely: 1) Geodatabase data; 2) Maps before cross-sector; 3) Determination of regent/mayor regulation (raperda/ranperkada). The post-review questionnaire also collected critics and suggestions for the RDTR design process. **Table 2** shows several impediments identified by the Directorate General of Spatial Planning in 2021 and still encountered in the post-UUCK period according to the questionnaire.

Table 2. Impediments in the RDTR design results from post review.

No	Impediments
Preparation Stage	
1	Regional governments have not yet committed and have not prioritized the design process of RDTR.
Data and Information Collection Stage	
1	Base map assistance process with BIG
2	The map does not match the database (Ministry regulation of ATR/BPN No. 14 of 2020)
3	CSRT data sources and other maps are not updated
4	Land data is difficult to obtain from the Local Land Office (BPN)
5	Secondary and spatially based sectoral data are difficult to obtain from institution within Local Governments
Data Processing and Analysis Stage	
1	Analysis and nomenclature adjustments from previous regulation
2	Still need to consider and integrate KRB and disaster mitigation

3	The KLHS and RDTR technical content formulation work was not integrated because it was carried out by two teams from two different local institution—Local Governments
Concept Formulation Stage	
1	Compliance of 20% green open spaces (RTH) in delineation
2	Protected Agriculture Land (LP2B) has not been determined; Regency/City RDTR has not fulfilled the LP2B area that has been determined by the province
3	Changes in forest areas and coastline boundaries
4	Inconsistencies between the RDTR and the regional spatial plan
5	The regional spatial plan is still in the revision process, so coordination is needed for adjustments.
6	Inconsistencies between the materials, RDTR regulation drafts, and map attachments.
7	Overlapping policies between sectors
Drafting and Discussion Stage of RDTR Regulation Draft	
1	Inconsistencies between the materials, RDTR regulation drafts, and map attachments.
2	No official KLHS Validation procedures from the Central Government (Ministry of Forestry)
3	Issuance of validation letter for old strategic environmental studies
4	Forum participants in cross-sector discussions have less understanding making them less actively involved
Managerial Impediments	
1	Lack of experts in the Local Government for the design of RDTR
2	Lack of experts in the Central Government to handle Technical Guidance
3	Local Government does not have sufficient budget for the design of RDTR
4	Lack of local government's budget for the formulation of KLHS integrated into RDTR
5	Time constraint of RDTR design
6	Coordination between Central Ministries/Agencies related to spatial planning affairs
7	Targets that are still changing, adjusting to the progress of each
No	**Impediments**
Other impediments in RDTR design	
1	Lack of human resources for rapid improvement of the RDTR Draft after cross-sector activities
2	Time constraints in involving the community
3	Limitations of interactive media in involving the community
4	There is no specific guidance regarding community involvement
5	Implementation of public consultation is not yet optimal

(Own study).

The impediments found are consistent with the results of the desk study of impediments on the design of RDTR from the Directorate General of Spatial Planning. These impediments need to be addressed to improve the policy of accelerating the RDTR design.

4.3. Existing policy analysis

The Law on the Indonesian National Development Planning System (Law 25/2004) stipulates that spatial plans align with development planning documents, including the Long-Term Development Plan, Medium-Term Development Plan, and Yearly Plan. Supporting data, such as the Strategic Environmental Assessment (KLHS), Disaster-Prone Area Assessment (KRB), and Geo-Heritage Tourism Area Master Plan, are integral to ensuring effective spatial planning.

Spatial planning integration is a comprehensive approach that involves both government and society to create land use maps that outline strategies for simultaneously achieving a variety of outcomes, including those related to nature, climate, and sustainable development (UNDP, 2022). In Indonesia, Law 26/2007 regulates land spatial planning, while Law 27/2007 governs coastal areas, small islands, and seas under a different ministry. In line with the One Map Policy in 2016 and Indonesia's One Data Policy, which began in 2019, to address overlapping regulations, the Job Creation Law of 2020 as an omnibus law, includes the integration of land, coastal, and marine spatial planning policies. This shift necessitates the review and revision of all existing spatial planning documents, reformulation of governance involving relevant ministries, and redefinition of roles, authorities, and timelines for stakeholders. This change also accelerates the design of RDTR.

Indonesia faces challenges in spatial planning, including inconsistencies between general and detailed plans, which lead to decision-making bias. Unlike countries such as the UK and Australia, where general plans serve as strategic guides, both general and detailed plans in Indonesia have legal force. When detailed plans are unavailable, the use of general plans often leads to subjective decisions.

4.4. Stakeholder analysis

Social Network Analysis (SNA) is used to identify stakeholder roles during each stage of the design process based on their importance and to examine changes in roles due to regulatory differences between Minister Regulation ATR/BPN numbers 8 of 2017, 16 of 2018 (prior to UUCK), and 11 of 2021 (post-UUCK). The latest regulation, number 11 of 2021, introduces changes in authority, reducing roles that impede the spatial plan design process and adding strategic authorities.

Organizational Network Analysis (ONA) complements this by mapping the roles of agencies and organizations involved in spatial planning in Indonesia. This mapping is based on a review of the spatial planning process, global spatial planning systems, and relevant planning content. Stakeholders contribute data and play specific roles aligned with their duties. Some key changes are identified in stakeholder authority. 1) Base Map Quality: Previously, the Geospatial Information Agency (BIG) verified and validated base maps without a time frame. Under the new regulation, BIG must provide recommendations within ten days, or the recommendation can be disregarded; 2) Strategic Environmental Assessment (KLHS): Previously, KLHS validation by the Ministry of Environment and Forestry (KLHK) occurred separately. Now, KLHS is collaboratively formulated with the spatial plan, and validation occurs simultaneously at the final stage; 3) Cross-Sector Discussion Submission: Earlier, discussions needed to wait for governor recommendations. Now, discussions can proceed without them; 4) Forest Area Delineation: The new regulation mandates the Ministry of Environment and Forestry approval for delineation, a step not regulated previously; 5) RDTR Enactment: While prior regulations required local government enactment of regulation drafts within one year, the new regulation allows the Minister of ATR/BPN to enact them if local governments fail to act within a month of substantive approval. These changes aim to increase efficiency by clarifying responsibilities and time frames for spatial plan formulation and enactment.

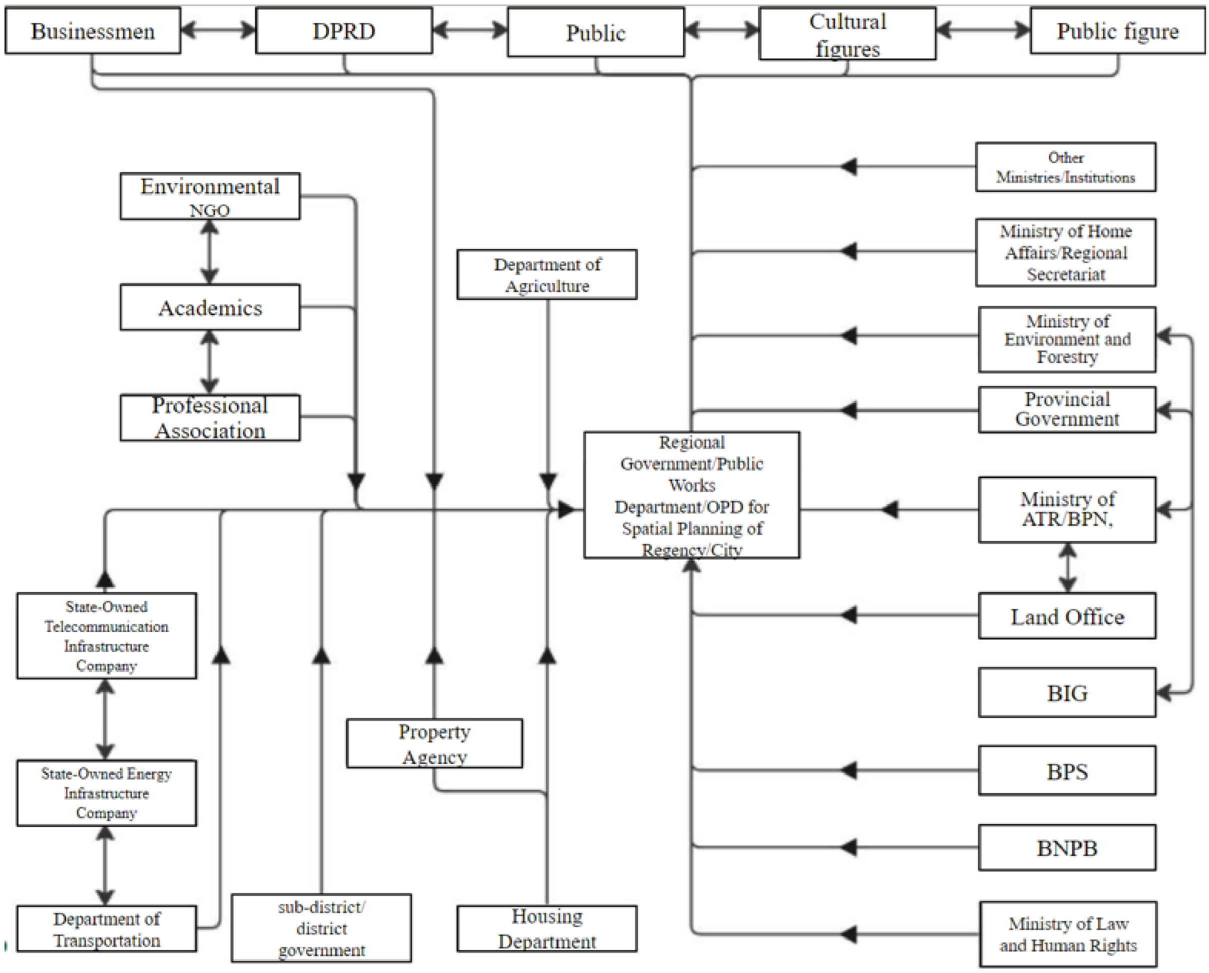

Figure 4. Relationship between stakeholders (Santo et al., 2024b).

Stakeholder analysis highlights shifts in authority, such as increased importance for the Ministry of Environment and Forestry and decreased importance for the Geospatial Information Agency post-UUCK. A comprehensive mapping of stakeholder roles shows interconnectivity in the spatial planning process as shown in **Figure 4**, enabling identification of those with the greatest influence. Despite regulatory changes, most stakeholders retain their importance. Some shifts, such as those affecting the Ministry of Environment and Forestry and BIG, reflect adjustments to the design process (Santo et al., 2024b).

4.5. Existing business process analysis

Existing business processes were analyzed to identify changes while ensuring stage consistency, increasing overall quality in Business Process Management (Mahendrawathi, 2018). The current RDTR design process, guided by the Minister of ATR/BPN Regulation, aims to accelerate completion time from 24 months to 12 months. This process integrates the Strategic Environmental Assessment (KLHS) into an RDTR design to improve outcomes.

The business process is described using the Business Process Modelling and Notation (BPMN) method, which outlines activities from inputs to outputs to achieve specific goals (Chang, 2006; Dumas et al., 2013; Mahendrawathi, 2018). The Level 1 process (**Figure 5**) is divided into four main stages: Location planning, preparation, implementation (formulation), and determination of regulations by the Regent/Mayor.

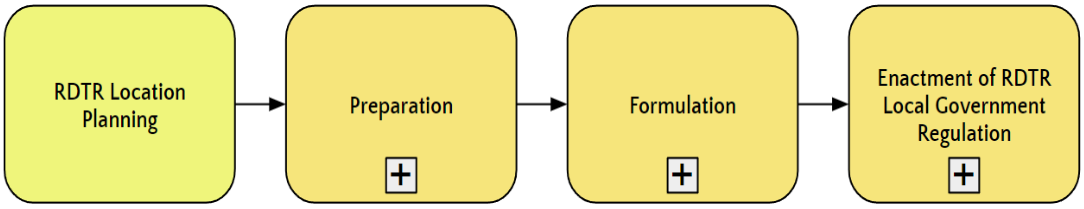

Figure 5. The business process of RDTR design level 1.
(Own study).

Level 2 (**Figure 6**) provides more detailed descriptions of these stages.

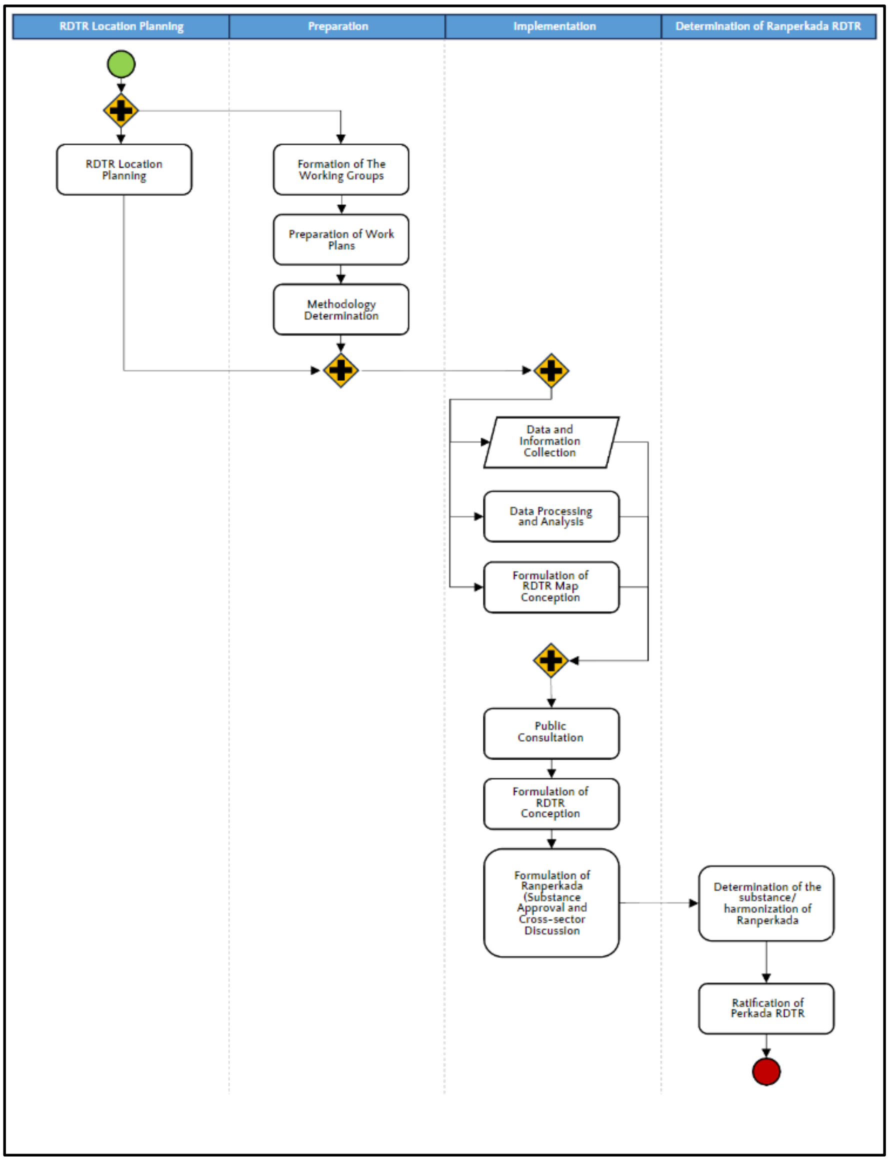

Figure 6. The business process of RDTR level 2.
(Own study).

Although regulations set the design process duration at 360 days (12 months), post-review findings indicate an average completion time of 602 days (approximately 20 months), reflecting an 8-month delay. Document reviews further corroborate this with similar findings of 598 days (about 19 months and 28 days). This discrepancy highlights the challenges in aligning practice with regulatory goals.

The delays stem from three primary issues, namely: 1) Local government commitment in budget allocation; 2) availability of data; and 3) availability of human resources. The findings are consistent with the results of the analysis conducted by the Directorate General of Spatial Planning (Direktorat Jenderal Tata Ruang, 2023).

4.6. Critical points

The analysis conducted through the influence factor survey and post-review survey identified critical points at each stage of the RDTR design process that become impediments. A comparison and correlation of these critical points with the RDTR completion timeline, based on post-review assessments, document analysis, and regulatory requirements, are illustrated in **Figure 7**.

The findings show that each stage of the RDTR design process faces uncertainties that hinder its implementation. To address these challenges, targeted mitigation strategies are necessary. For instance, the difficulty in collecting valid and up-to-date data could be resolved by implementing a web-based integrated database that connects central and regional governments.

These mitigation strategies need to be incorporated into business process improvement scenarios and opportunities as the new policy initiatives through business process improvement schemes.

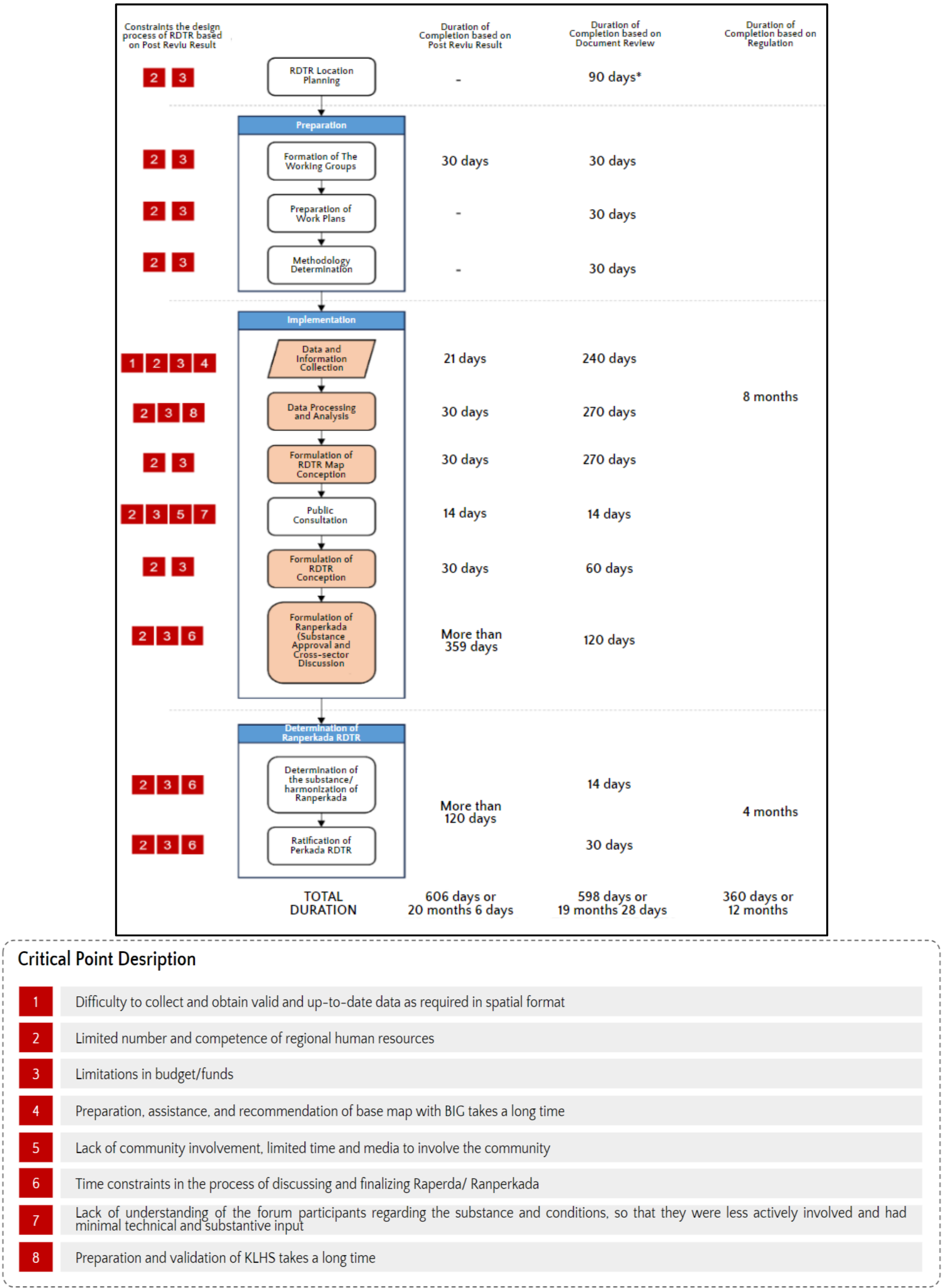

Figure 7. Critical points and duration comparison of RDTR design process.
(Own study).

4.7. Business process reengineering

Scenario planning methods are a suitable tool for understanding complexity by encouraging participants to analyze logical paths and develop strategic options, making them an effective response to increasingly complex environments (Bouhalleb and Smida, 2020). In this research, scenario planning with the TAIDA framework produces a reengineering scheme as a new initiative in response to addressing the critical points in the RDTR design process. The reengineering transforms the "as is" business process into the "to be" business process through alternative steps, in particular changing positions, dividing stages, and automating processes.

The automation is included by leveraging the advances in Information and Communication Technology (ICT). Increasing evidence suggests that disruptive technologies are driving fundamental changes in spatial planning practices (de Vries, 2021). The application of ICT in planning and policy design at all scales holds a great potential that is becoming increasingly acknowledged by all stakeholders (Pinto et al., n.d.). Moreover, ICT enables innovative ways of collaborating based on knowledge management that goes beyond just moving traditional methods online by allowing broader participation that is more open, fair, and transparent (Märker et al., 2003). Currently, Indonesian Ministry of ATR/BPN already hosts a GIS spatial planning ecosystem named GISTARU. Despite the downside of unidirectional information display in some applications under GISTARU, it is important to acknowledge the system as a valuable tool in the context of smart governance (Rachmawati et al., 2024).

Scenarios need to have the following characteristics: Manageability, plausibility, consistency, comprehensibility, relevance, differentiation, and transparency (Dean, 2019). In this business process reengineering effort, scenario planning analysis identified 11 main stages for improvement as shown in **Table 3** below.

The redesigned scenarios are incorporated into the "to be" business process presented in **Figure 8**. Simulation of the new business process showed an optimal process completion time, upon the fulfillment of 5 critical prerequisites, specifically certainty of local government commitment, suitability of the needs and format of data collected, implementation of automation in data processing and analysis, community involvement in inclusive public participation, and implementation of substance approval processes with an expert system. Fulfillment of these conditions is expected to yield an ideal time for designing RDTR, which is 301 days or 10 months and 1 week, based on the simulation results using Visual Paradigm 16.2 application. Further measurement of the proposed business process will be based on these criterias: Importance (strategic relevance), dysfunction (health of each process), and feasibility (Dumas et al., 2013).

While the new process has significant potential, resource challenges, such as additional budget, availability of skilled personnel, and access to necessary technology, must be carefully assessed as they can impact the feasibility of implementation. Jia et al. (2024) developed a methodological framework that leverages technological advancements to support land-use optimization decisions within China's territorial spatial planning system, though limitations remain in applying these technologies to real-world spatial planning scenarios.

Introducing new business processes naturally disrupts established practices, and reform initiatives often face resistance from stakeholders (Khaw et al., 2022). Socio-cultural (Osobajo et al., 2023) and technological barriers (Byiringiro et al., 2022) further hinder meaningful stakeholder engagement. Key socio-cultural enablers, including communication, transparency, cultural understanding, and trust, are essential for improving collaboration (Osobajo et al., 2023). At the same time, technological barriers, such as inequalities in infrastructure, can hinder people's capacity to engage effectively (Matli and Wamba, 2023).

To overcome these challenges, public policies aimed at managing coexistence in shared accountable spaces must prioritize distribution of ownership among stakeholders (Healey, 1997). Spatial planning efforts must strike a balance between technical aspects and active engagement, ensuring that decision-making processes for the future are inclusive (Jia et al., 2024; Nadin et al., 2021; Persson, 2013).

In an era of increased public awareness and pressure to limit undue influence, organizations can strengthen trust by improving accountability and showing a commitment to serving the public interest (Healey, 1997). Moving forward, a deeper analysis is needed to identify actionable solutions and assess the feasibility of the desired "to-be" business processes. Tools like cross-impact analysis and the Wilson matrix, within a scenario planning framework, offer valuable methods to examine challenges and develop targeted strategies for overcoming them (Amer et al., 2013). Future spatial plan design projects which address these factors can serve as pilot projects to test the process on a small scale.

In the Acting phase of the TAIDA framework, the implementation of the new initiative should be assessed using the 8R framework to ensure alignment with the responsible land management practice. De Vries and Rudianto (2023) stated that the assessment framework for specific land intervention should include aspects of responsiveness, robustness, respect, recognizability, resilience, reliability, reflexiveness, and retraceability, to be able to better detect whether changes to a land policy framework, or specific project, are sufficiently responsible. Previously the 8R framework has been used to assess the land reclamation projects in Indonesia.

Table 3. Scenario planning for the design process of RDTR.

No	Critical Points	Critical point mitigation schemes with Scenario Planning
1	Commitment of Leaders and Local Government	Local governments must ensure that budget allocations are sufficient to fund the design process of RDTR.
2	Location Planning	The RDTR design process starts from location planning that is determined by the Regent/Mayor. The Readiness Criteria Index assessment can be conducted afterwards.
3	Preparation	Formation of an integrated team consists of 2 (two) task forces to prepare RDTR and KLHS concurrently.
4	Execution—Data and Information Collection	Move the position of the data and information collection stage to after the RDTR location planning stage or after the determination of the RDTR task force.
5	Execution—Data Processing & Analysis and Formulation of RDTR Map Conception	The RDTR task force starts the collaboration by establishing a basemap as a common operational map (com) for stakeholders. Spatial analysis automation with an expert system is required to streamline the process.
6	Execution—Public Participation	The public consultation can begin after the RDTR location is determined to get the community

		involved with data logging activities from the online platforms.
7	Execution—KLHS Formulation and Validation	Integration of RDTR and KLHS task forces and their respective business processes. The Ministry of ATR/BPN and the Ministry of Environment and Forestry as the supervising institutions need to formulate a joint policy in the integration.
8	Execution—Formulation of Ranperkada	The legal draft of RDTR must be ready before the submission for substance approval from the Local Government to the Ministry of ATR/BPN.
9	Execution—Cross-sector Discussion	Activities focused on verifying and clarifying what had been integrated and analyzed at the data iteration stage for conception formulation.
10	Execution—Substance Approval	The substance approval process can be performed by an automated system to check the quality and consistency of the RDTR.
11	Integration of RDTR with OSS System	The format of the final output data from the data processing and analysis for the RDTR map must be appropriate and compatible with the data format set in the OSS system, so that immediate integration is possible.

(Own study).

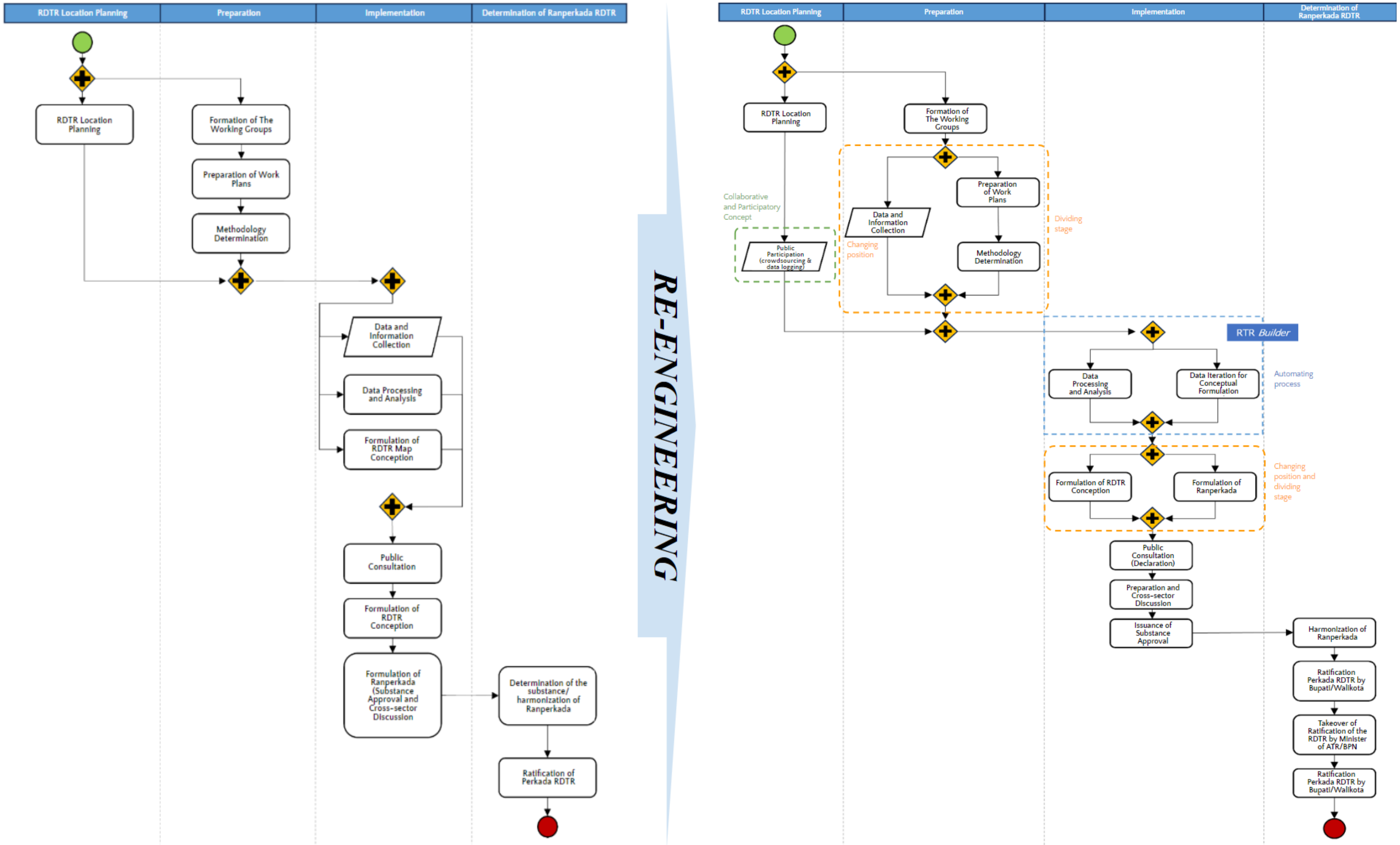

Figure 8. The business process of RDTR level 2 (as is) and the business process of RDTR level 2 (to be).
(Own study).

5. Conclusions and recommendations

This research identifies the critical points at each stage of RDTR design business process from the analysis of factors influencing the acceleration of RDTR design as well as the post-review analysis, existing policy analysis, stakeholder analysis, and existing business process analysis. These include local government commitment, limited human resource competence, budget constraints, technical operational issues, and repeated challenges such as obtaining valid, up-to-date spatial data. These impediments hinder the timely completion of RDTR design, resulting in underperformance in RDTR design acceleration policy.

To address these critical points, this research introduces a business process improvement scenario focusing on business process management. The proposed reengineering scheme includes alternatives such as repositioning roles, dividing stages, and automating processes. This scheme entails several consequences, including amendments to spatial planning regulations, improved governance, clear role definitions for stakeholders, enhanced local government commitment, standardized data aligned with the One Map Policy and One Data Indonesia, and the development of automated spatial planning data analysis tools. Implementing these changes requires collaboration among business process owners to formulate joint policies governing roles, authority, and timelines within an integrated framework.

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References

Acheampong, R.A. (2019). The Concept of Spatial Planning and the Planning System, in: Spatial Planning in Ghana, The Urban Book Series. Springer International Publishing, Cham, pp. 11–27. https://doi.org/10,1007/978-3030-02011-8_2

Alfasi, N., Portugali, J. (2007). Planning rules for a self-planned city. Planning Theory 6, 164–182. https://doi.org/10,1177/1473095207077587

Allmendinger, P. (2002). Towards a post-positivist typology of planning theory. Planning Theory 1, 77–99. https://doi.org/10,1177/147309520200100105

Amer, M., ,Daim, T.U., Jetter, A. (2013). A Review Of Scenario Planning. Futures Volume 46, February 2013, Pages 23-40. https://doi.org/10.1016/j.futures.2012.10.003

Bagheri, M., Zaiton Ibrahim, Z., Mansor, S., et al. (2021). Application of Multi-Criteria Decision-Making Model and Expert Choice Software for Coastal City Vulnerability Evaluation. Urban Science, 5(4), 84.

Bennett, R.M., Hutabarat, I.R., Unger, E.-M., et al. (2023). Digital Transformation in Indonesian Land Administration. Geospatial Science for Smart Land Management:43-67.

Bouhalleb, A., Smida, A. (2020). Exploring the relationship between scenario planning and strategic flexibility and complexity. European Journal of International Management, ff10.1504/EJIM.2019.10016812ff. ffhal-03845924f

Bui, Q.-T., Pham, L.-T., Nguyen, H.,-D., et al. (2023). Machine Learning and Metaheuristic Optimization Algorithms for Land Cover Classification. Geospatial Science for Smart Land Management:119-131.

Byiringiro, S., Lacanienta, C., Clark, R., et al. (2022). Digital and virtual strategies to advance community stakeholder engagement in research during COVID-19 pandemic. J Clin Transl Sci. 2022 Aug 30;6(1):e121. doi: 10.1017/cts.2022.457. PMID: 36285018; PMCID: PMC9549580.

Byrne, D. (2003). Complexity theory and planning theory: A necessary encounter. Planning Theory, 2(3), 171–178. https://doi.org/10.1177/147309520323002

Chang, J. F., (2006). Business process management systems: strategy and implementation. Boca Raton, FL: Auerbach Publications.

Cordova-Pozo, K., Rouwette, E., 2023. Types of scenario planning and their effective : a review of reviews. Journal of Future. Published by Elsevier Ltd. https://doi.org/10.1016/j.futures.2023.103153

de Vries, W.T. (2021). Trends in The Adoption of New Geospatial Technologies for Spatial Planning and Land Management in 2021. GeoPlanning: Journal of Geomatics and Planning. DOI: 10.14710/geoplanning.8.2.85-98

de Vries, W.T., Rudiarto, I. (2023). Testing and Enhancing the 8R Framework of Responsible Land Management with Documented Strategies and Effects of Land Reclamation Projects in Indonesia. Land 2023, 12, 208. https://doi.org/ 10.3390/land12010208

Dean, M. (2019). Scenario Planning: A Literature Review. Multi-modal Optimisation for Road-space in Europe, University College London. DOI:10.13140/RG.2.2.12629.24802

Direktorat Jenderal Tata Ruang. (2021). Percepatan Penyelesaian RDTR Kabupaten/Kota. Jakarta: Sekretaris Jenderal Tata Ruang

Direktorat Jenderal Tata Ruang. (2023). Kajian Rekomendasi dan Rencana Aksi: Percepatan Penyediaan Rencana Detail Tata Ruang (RDTR). Direktorat Jenderal Tata Ruang, Kementerian ATR/BPN, Jakarta.

Dumas, M., La Rosa, M., Mendling, J., Reijers, H.A., (2013). Fundamentals of Business Process Management. Springer Berlin Heidelberg, Berlin, Heidelberg. https://doi.org/10,1007/978-3-642-33143-5

Elbakidze, M., Dawson, L., Andersson, K., et al. (2015). Is spatial planning a collaborative learning process? A case study from a rural–urban gradient in Sweden. Land Use Policy, 48, 270-285. https://doi.org/https://doi.org/10,1016/j.landusepol.2015.05.001

Enemark, S. (2006). Understanding the Land Management Paradigm. In P. van der Molen, & C. Lemmen (Eds.), Proceedings: Innovative technology for land administration 17–27.

Erkan, T. E., Elsharida, W. M. (2020). Combining AHP and ROC with GIS for airport site selection: a case study in Libya. ISPRS International Journal of Geo-Information, 9(5), 312.

Faludi, A., (1973). A Reader in Planning Theory. Pergamon, Oxford.

Forman, E. H., Selly, M.A. (2001). Decision By Objectives How To Convince Others That You Are Right. World Scientific.

Harrington, H. J., (1991). Business process improvement: The breakthrough strategy for total quality, productivity, and competitiveness.

Healey, P. (1997). Collaborative planning: Shaping Places in Fragmented Societies. Macmillan Education UK. https://books.google.co.id/books?id=xkxdDwAAQBAJ

Holden, M. (2008). The Tough Minded and the Tender Minded: A Pragmatic Turn for Sustainable Development Planning and Policy. Planning Theory & Practice 9, 475–496. https://doi.org/10,1080/14649350802481371

Holgersen, S., Haarstad, H., (2009). Class, Community and Communicative Planning: Urban Redevelopment at King's Cross, London. Antipode 41, 348–370, https://doi.org/10,1111/j.1467-8330,2009.00676.x

Hudalah, D., Woltjer, J. (2007). Spatial Planning System in Transitional Indonesia. International Planning Studies, 12, 29 - 303.

Ishizaka, A., Labib, A. (2009). Analytic Hierarchy Process and Expert Choice: Benefits and limitations. OR Insight, 22(4), 201–220. https://doi.org/10.1057/ori.2009.10.

Jia, M.; Liu, A.; Narahara, T. The Integration of Dual Evaluation and MinimumSpanning Tree Clustering to Support Decision-Making in Territorial Spatial Planning. Sustainability 2024, 16, 3928. https://doi.org/10.3390/su16103928

Kasim, T., Haračić, M., Haračić, M.. (2018). The Improvement of Business Efficiency Through Business Process Management. Journal of Economics and Business.

Khaw, K.W., Alnoor, A., AL-Abrrow, H., et al. (2022). Reactions towards organizational change: a systematic literature review. Curr Psychol 42, 19137–19160 (2023). https://doi.org/10.1007/s12144-022-03070-6

Kitchen, T. (2006). Skills for Planning Practice. Macmillan Education UK. https://books.google.co.id/books?id=0Du0HQAACAAJ

Klein, L.L., De Pádua, S.I.D., Gera, R., et al. (2023). Business process management effectiveness and maturity through lean management practices: the Brazilian federal police experience. IJLSS 14, 368–396. https://doi.org/10,1108/IJLSS-07-2021-0125

KPPOD, (2016). Reformasi Kemudahan Berusaha: Evaluasi Pelaksanaan Paket Kebijakan Ekonomi di Daerah. https://www.kppod.org/backend/files/laporan_penelitian/eodb-reformasi-kemudahan-berusaha.pdf.

Ksenofontov, A. A., Ksenofontov, A. S., Kirpicheva, M. A., Trifonov, P. V. (2019). The use of modern management technology to improve business efficiency. In IOP conference series: Materials Science and Engineering (Vol. 483, No. 1, p. 012114). IOP Publishing.

Laurian, L. (2009). Trust in Planning: Theoretical and Practical Considerations for Participatory and Deliberative Planning. Planning Theory & Practice 10, 369–391. https://doi.org/10,1080/14649350903229810

Legacy, C. (2012). Achieving Legitimacy Through Deliberative Plan-Making Processes—Lessons for Metropolitan Strategic Planning. Planning Theory & Practice 13, 71–87. https://doi.org/10.1080/14649357.2012.649947

Lindgren, M., Bandhold, H. (2003). Scenario planning: The Link between Future and Strategy. Springer.

Mahendrawathi, E.R. (2018). Business Process Management, I. ed. ANDI OFFSET, Yogyakarta.

Märker, O., Voß, A., Roeder, S. (2003). Optimizing Cooperation in Spatial Planning for eGovernment. Lecture Notes in Computer Science 2645:239-249. DOI:10.1007/3-540-44836-5_25

Mastrocinque, E., Ramírez, F. J., Honrubia-Escribano, A., Pham, D. T. (2020). An AHP-based multi-criteria model for sustainable supply chain development in the renewable energy sector. Expert Systems with Applications, 150, 113321.

Matli, W., Wamba, S.F. 2023. Work from anywhere: inequalities in technology infrastructure distribution for digit workers. Digital Transformation and Society Vol. 2 No. 2, 2023 pp. 149-162. DOI 10.1108/DTS-08-2022-0042

Nadin, V., Stead, D., Dąbrowski, M., Fernandez-Maldonado, A.M. Integrated, adaptive and participatory spatial planning: Trends across Europe. Reg. Stud. 2021, 55, 791–803.

Norton, R. K. (2005). Local Commitment to State-Mandated Planning in Coastal North Carolina. Journal of Planning Education and Research, 25(2), 149–171. doi:10,1177/0739456x05278984

Oliver, J. J. (2023). Scenario planning: Reflecting on cases of actionable knowledge. Futures & Foresight Science, 5, e164. https://doi.org/10.1002/ffo2.164

Osobajo, O.A., Okeb, A., Ajimmyc, M., et al. (2023). The role of culture in stakeholder engagement: Its implication for open innovation. Journal of open innovation: technology, market and complexity [online], 9(2), article 100058. https://doi.org/10.1016/j.joitmc.2023.100058

Persson, C. (2013). Deliberation or doctrine? Land use and spatial planning for sustainable development in Sweden. Land Use Policy, 34, 301–313.

Pinto, N.N., Lancrenon, D., Berchtold, M. New ICT in Planning Practice: a permanent need to innovate in practice.

Rachmawati, R., Ghiffari, R.A., Widjani, A.F., et al. (2024). Optimizing GISTARU: Evaluating a GIS-Based Platform's Contribution to Indonesian Spatial Planning for Smart City Development. GeoPlanning: Journal of Geomatics and Planning. DOI: 10.14710/geoplanning.11.1.57-70.

Ratih, Putera, R. E., Koeswara, H. (2023). Analysis of Implementation of OSS-RBA Policy in Padang City. Journal of Public Administration and Government, 5(2), 203-218. https://doi.org/10.22487/jpag.v5i2.1006

Ringland, G. 1998. Scenario Planning: Managing for the Future. John Wiley and Sons Ltd.

Rustiadi, E., Indraprahasta, G.S., Mulya, S.P. (2021). Teori Perencanaan: Mazhab dan Praktik Perencanaan Pengembangan Wilayah. Yayasan Pustaka Obor Indonesia, Jakarta.

Saaty, T. (1977). A scaling method for priorities in hierarchical structures. Journal of mathematical psychology 15(3): 234-281.

Saaty, Thomas L. (2008). Decision Making With Analytical Hierarchy Process. International journal service science. Vol. 1, No 1, page 83-98.

Şahin, S.Z. (2019). The urbanization policy of Turkey: an uneasy symbiosis of unimplemented policy with centralized pragmatic interventions. Turkish Studies 20, 599–618. https://doi.org/10,1080/14683849.2019.1602826

Santo, D., Achsani, N.A., Rustiadi, E., Buono, A. (2024a). Factors influencing the acceleration of detailed spatial plan (RDTR) preparation in Indonesia, Jurnal Pembangunan Wilayah dan Kota, Vol 20, No.3, 309-324. https://doi.org/10.14710/pwk.v20i3. https://ejournal.undip.ac.id/index.php/pwk/article/view/64229/pdf.

Santo, D., Achsani, N. A., Rustiadi, E., Buono, A. (2024b). Optimization of Participatory and Collaborative Planning Methods for Accelerating the Preparation of Detailed Spatial Plans. BHUMI: Jurnal Agraria dan Pertanahan, 9(1), 63-82. https://doi.org/10.31292/bhumi.v9i1.767. https://jurnalbhumi.stpn.ac.id/index.php/JB/article/view/767/411.

Sari, R. K., Despa, D., Sukmana, I., (2022). Keterpaduan Infrastruktur Antar Sektor untuk Mendukung Pengembangan Wilayah. Jurnal Rekayasa Lampung, 1(3). https://doi.org/10.23960/jrl.v1i3.15.

Stephany, S. (2021). Qualitative Comparative Analysis in Space Utilization Control in Indonesia. University of Groningen and Institute Technology of Bandung.

Taufiq, M., Suhirman, Kombaitan, B. (2021). A Reflection on Transactive Planning: Transfer of Planning Knowledge in Local Community-Level Deliberation. SAGE Open 11, 215824402110227. https://doi.org/10.1177/21582440211022739

UN Habitat. (2023). Enabling Meaningful Public Participation in Spatial Planning Processes. Nairobi: United Nations Human Settlements Programme.

UNDP. (2022). Integrated Spatial Planning Workbook. United Nations Development Programme: New York.

Villanueva, G., Gonzalez, C., Son, M., et al. (2017). Ringing local voices into community revitalization: engaged communication research in Urban planning. Journal of Applied Communication Research 45, 474–494. https://doi.org/10.1080/00909882.2017.1382711

Wen, R., Li, S. (2023). Spatial Decision Support Systems with Automated Machine Learning: A Review. ISPRS Int. J. Geo-Inf. 2023, 12, 12. https://doi.org/10.3390/ ijgi12010012

Weske, M. (2007). Business process management: concepts, languages, architectures. Springer, Berlin; New York.

World Bank. (2020). Doing Business 2020: Comparing Business Regulation in 190 Economies. Library of Congress Control Number: 2019951789.

World Bank. (2024). Business Ready 2024. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO.

World Economic Forum. (2020). The Global Competitiveness Report: How countries are performing on the road to recovery, Special Edition 2020, ed.