

ORIGINAL ARTICLE

The influence of community economic development and peat area governance on Society 5.0

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ABSTRACT

This article is a study of the institutional governance of farmers in Bukit Batu District, Bengkalis Regency using the concept of Society 5.0 and the governance paradigm for analysis in peat area studies. This study aims to determine the form of institutional governance of smallholder agriculture in peat areas and determine the truth of the influence of community economic management and development indicators on Society 5.0, which results from empirical studies in the field. This study uses the mixed methods method, which combines quantitative and qualitative data analysis to measure the truth of information. The results of the study illustrate that the question study first finds existing forms of institutional governance walk, however still passive; this is caused by constraints of knowledge management plant horticulture in the region peat, utilization process nutrients, and management techniques group sustainable farming in aspect regulation government and empowerment company around through CSR; on the question, it has been furthermore found that management variables and community economic development have a positive influence on Society 5.0. This study uses quantitative analysis and calculation results from the SPSS analysis test to support this conclusion. From this study, it formulated recommendation from the synergy between economic development and management of peat areas to socio-economic and environmental impacts that must be considered by interested stakeholders, as well as maximizing function technology in making it easy to manage horticulture plants in peat areas as a form of Society 5.0 to minimize behind.

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KEYWORDS

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1. Introduction

This social study article examines community life in peat areas through governance theory and Society 5.0. In this case, peat areas are considered attractive because their structure determines the community's environmental aspects and economic sustainability. Based on previous research, Andari (2021) states that developing terrestrial ecosystems is not only a national task. Because the breadth of terrestrial ecosystems contributes to the well-being of all, even with resources, the government will only be able to work independently with the role of other actors, especially the community, which is needed to support the process of developing terrestrial ecosystems. One form is the agricultural ecosystem; in this case, only some know the importance of protecting terrestrial ecosystems. In addition, research by Deguchi et al. (2020) stated that there is a need for periodic evaluations to increase selling points and competitiveness as well as existing local wisdom, and for Indonesian agricultural reform, an important strategy is to maintain the concept of long-term operational development (Syahputri and Kusdarini, 2021; Syahza, Nasrul, et al., 2021).

Several related literature studies show that implementing a government by inappropriate regulations and decisions or policies that are not in place. The government must move from conventional systems to digitalization in this modern era. However, the implementation of digitalization must be adapted to the target community. Often, these decisions must follow the target community (Hanifa et al., 2023). Corporate governance has benchmarks for the realization of management of a government system that uses a private service system. However, this has led to a shift in priorities whose implementation must be adapted to the sector's needs (Salman et al., 2022). Governance partially has a significant effect on the performance of local governments. The influence shown is positive, meaning that the better the good governance, the performance of the local government will also increase (Syafrihal and Resdati, 2020).

A review of the literature on downstream in Indonesia and comparisons with other countries can provide valuable insights into this approach's potential benefits and challenges to economic development. Overview literature about downstream in Indonesia can focus on the impact approach to the local economy, job market, and potency impact environment. For example, a study by Rosilawati and Dewi (2021) about farmers' response to changing climate in the area irrigation downstream finds that farmers in the area downstream use knowledge of local and non-local to reduce the vulnerability of system livelihood to water shortage and rise temperature. Temporarily, a study by Suprehatin (2019) about plant horticulture in Indonesia finds that application practice mark plus varies among farmers, with those who have access to source more power and infrastructure goods tend to adopt the practice. Another potential field to become a study of literature about downstream in Indonesia is the role of urban agriculture (Yunginger and Dako, 2021) in creating products worth adding and promoting resilient food. Agriculture urban own potency to provide a source of nutritious and valuable food economy, as well as involvement society, and the government has applied policy for push utilization yard for production food. In Indonesia, one can focus on the impact of this approach on the local economy and the labor market (Wansleben, 2013). It can also examine the potential environmental effects of downstream activities and the role of urban

agriculture in mitigating these impacts (Yunginger and Dako, 2021). Relevant studies include researching farmers' responses to climate change and applying value-added practices to horticultural crops (Salman et al., 2022). In addition, studies can explore the potential benefits and challenges downstream for economic development and job creation and their impact on local communities (Bonye et al., 2013).

In comparison, downstream horticulture in Bengkalis can be an effective strategy in increasing mark-plus horticulture products and reducing dependency on imports. Bengkalis have great potential in development horticulture because they own fertile land and a suitable climate for growing plant horticulture like vegetables, fruits, and flowers. Downstream horticulture can be done with raw material which can become the finished product and is worth selling such as juice, sauce, chips, and so forth. Besides that, it can also be done with attractive and appropriate packaging with standard quality, so horticulture products from Bengkalis can compete in the local market and internationally. However, in doing downstream horticulture, it is also necessary to note the impact on the local environment and society. The impact of using chemical ingredients and processing waste from downstream horticulture on social economy needs to be analyzed. In the context of Bengkalis, several potential areas that can become focus in the literature review about downstream horticulture in Bengkalis are analysis of economic and social impact of development of processing horticulture products, evaluation of possible technology applied for producing quality horticulture products, and domestic and foreign market analysis of processed horticulture products from Bengkalis.

Hypothesis of this study: there is variation in the form of institutional smallholder agriculture governance in peat areas, which includes differences in structure organization, decision-making mechanism, and allocations of source power, as well as management of influence indicators and development of economic society has significantly positive connection to progress and achievements of Society 5.0 in peat areas. Objective of this study: to identify and analyze a form of institutional smallholder agriculture governance in peat areas and test the connection between management and development of community economic indicators with progress of Society 5.0. This study aims to understand better institutional smallholder agriculture governance and its impact on Society 5.0 and to give relevant recommendations and guidelines for developing and implementing Society 5.0 in eat areas. Downstream analysis about the development of economy society and governance of peat areas towards Society 5.0 in Bengkalis will involve evaluating the impacts and benefits when the concept of Society 5.0 is applied in context. The following are some possible aspects analyzed:

- 1) Community economic development: (a) enhancement of income: analysis can be done to evaluate the development of community economy in Bengkalis, especially those sectors related with Society 5.0, which has given enhancement of income for local public; (b) economic diversification: it is important to analyze that development of economy public has pushed diversification of sector economy in Bengkalis, including related sectors with renewal technology and innovation in the context of Society 5.0.
- 2) Area management: (a) ecosystem sustainability of peat areas: analysis can be done to evaluate what governance of peat areas in Bengkalis has applied sustainable practices for protecting and restoring ecosystem peat; (b) social and economic impact: it is important to evaluate what governance of peat areas has given postive impact on local society, including enhancement of welfare and participation in activity sustainable economy.

- 3) Society 5.0: (a) application-level technology: analysis can be done to evaluate as far as renewable technology and related innovations with Society 5.0 has been implemented in Bengkalis, as well as the impact on society and economy; (b) improvement in quality of life: it is important to analyze that application concept of Society 5.0 in Bengkalis has given enhancement of quality of life for society, including access to more public service and improving efficiency in life every day.

This can be done through survey fieldwork, interviews, secondary data analysis, and monitoring related projects with the development of economy society and governance of peat areas in Bengkalis. Data and information collected can be used to evaluate the effectiveness of the steps taken, identify challenges and opportunities, and recommend strengthening Society 5.0 integration in the development of economy society and governance of peat areas in Bengkalis. Besides that, community empowerment is a concept of economic development that embodies social values. The increase in question is financial, prestige, dignity, self-confidence, and self-esteem. The rationale for community empowerment is that efforts must be directed at the root of the problem to increase community capacity. Community participation is integral to community development, facilitating the effective implementation of initiatives and achieving their goals (Avcin and Balcioğlu, 2017). The development of the agricultural sector for people on peatlands, especially in coastal areas, plays an essential role in the structure of the regional economy. In Riau Province, there is potential for peatlands of around 64% of the total land area that support the livelihoods of local people, especially for agriculture (Syahza, Bakce, et al., 2021). In addition to this research, Nikiforova (2021) increased participants' knowledge and motivation, consisting of community leaders, hamlet heads, and village governments, to manage mangrove ecosystems with sustainable principles such as implementing ecotourism or fishery product diversification. Therefore, this study aims to determine the effect of community economic development and institutional management indicators on Society 5.0; in this case, Society 5.0 is an effort to increase community capacity, quality, and skills in developing local resources. Therefore, the government is significant in developing empowerment and improving community economic development.

Innovation is a product that can be used to increase (good) change in all areas of society. Farazmand (2023) states that the existence of Society 5.0 is aimed where it is no longer a situation that adapts to environmental needs but how people try to restore environmental conditions. Besides, research by Nakanishi (2019) shows that the majority of people who are ready to use digitalization and are sensitive to the resolution and efforts of the government system are only carried out by people in developed countries. This is caused by uneven regional development, low quality of human resources, differences in educational standards, and damage to environmental ecosystems that cannot be revitalized. Society 5.0 and the management of peat areas have a significant relationship, considering that peat areas require greater attention in their management in their utilization as agricultural areas; this was conveyed by Nakanishi (2019), showing that the majority of people who are ready to use digitalization and are sensitive to the resolution and efforts of the government system are only carried out by people in developed countries. This is caused by uneven regional development, low quality of human resources, differences in educational standards, and damage to environmental ecosystems that cannot be revitalized. Furthermore, it was also conveyed by Susilowati and Windiani (2018) that peat restoration through efforts to plant peat land with suitable plants can provide increase the community's economy through the business of pineapple

dodol, pineapple sticks, and others.

Furthermore, in the concept of Society 5.0, solutions to problems emerge from the community through innovation. This can be appropriately implemented if there is a contribution from each actor. The contribution of these actors will create synergies between communities in innovating with assistance, which is intended to provide direction that follows the community's needs. Ferreira and Serpa (2018) describe that natural resource management must be considered relatively for the characteristics of the natural environment, its territory, and the socio-economic community (Sidiq et al., 2022).

It is downstream that the researcher describes in this paper how the general public can survive and create their downstream system to get sustainability implications. There is a connectedness between gap analysis and knowledge with objective articles, novelty relevance with previous accurate research papers, and contribution study. This can be seen through an analysis conducted to identify whether there are gaps in agricultural, horticultural infrastructure in peat areas, including irrigation, transport, and access to markets. If there are gaps, it is necessary to consider how the institutional governance of smallholder agriculture can help overcome these obstacles. Research can evaluate whether there are gaps in the knowledge and skills of Kelompok Tani members regarding effective horticultural farming practices in peat areas. This analysis can provide insight into how the institutional governance of smallholder agriculture can support increased member knowledge and expertise. This research can explore the role of institutional governance in improving the economic sustainability of Farmer Groups. An analysis can be carried out to evaluate the extent to which the farmer groups in Batang Duku Village have implemented the principles of Society 5.0 in their horticultural farming initiatives. This includes using renewable technologies, data, and analytics, collaboration and partnerships, and participating in sustainable economic activities. In this research, the main objective is to understand the institutional governance of smallholder agriculture in peat areas and to see the influence of community economic development and management indicators on Society 5.0 in the context of horticultural farming initiatives in Batang Duku Village. Through this research, a new understanding can be found regarding effective practices in the governance of smallholder agricultural institutions and their contribution to the achievement of Society 5.0.

2. Method

Elaboration of research questions can be seen in that study. This was done to find out the form of institutional governance of smallholder agriculture in peat areas and the truth of the influence of community economic development and management indicators on Society 5.0, which results from empirical studies in the field. The method used in this study is a mixed method with a conceptual research model using case studies as a research strategy. There are several methods used to collect data in understanding case studies, namely the primary method in this study is qualitative, namely data collection through field observations and interviews using SPSS software in processing data analysis and adding surveys. The data is analyzed and synthesized using the triangulation method. The mixed method approach in this study uses embedded design, especially the embedded correlational model. The design is determined because a qualitative approach will be used to explore and answer questions has yet to be revealed from the results of quantitative analysis (Miles et al., 2013).

Primary data sources were obtained from the group community, a village-owned business entity, and PT Pertamina Factory International RU II Pakning River. The sampling technique in this study is the method of simple random sampling, namely simple (uncomplicated), because the sample of members of the population is done randomly without regard to the existing strata in the population. The combined population in the group of farmers is 50 people, so the whole amount is used as a sample. The instrument in this study was a questionnaire to identify indicators of the influence of community economic development and management on community indicators quantitatively by using a classified or categorized questionnaire using a Likert scale, which can be seen in **Figure 1**. Furthermore, the identification of actors was carried out using a purposive sampling method. The sample in this study was a group of horticultural farmers who participated in horticultural agriculture focus group discussion activities. Data collection techniques used are survey techniques, in-depth interviews, and documentation studies, which aim to represent the institutional governance of farmers on peatlands. In this case, the pineapple farmers and citronella farmers are sheltered by an institution called the Village Owned Enterprise (BUMDes). Data analysis refers to the steps used (Howlet, 2019). These steps simultaneously include four streams of activities, including data collection, data aggregation, data presentation, and conclusion validation.

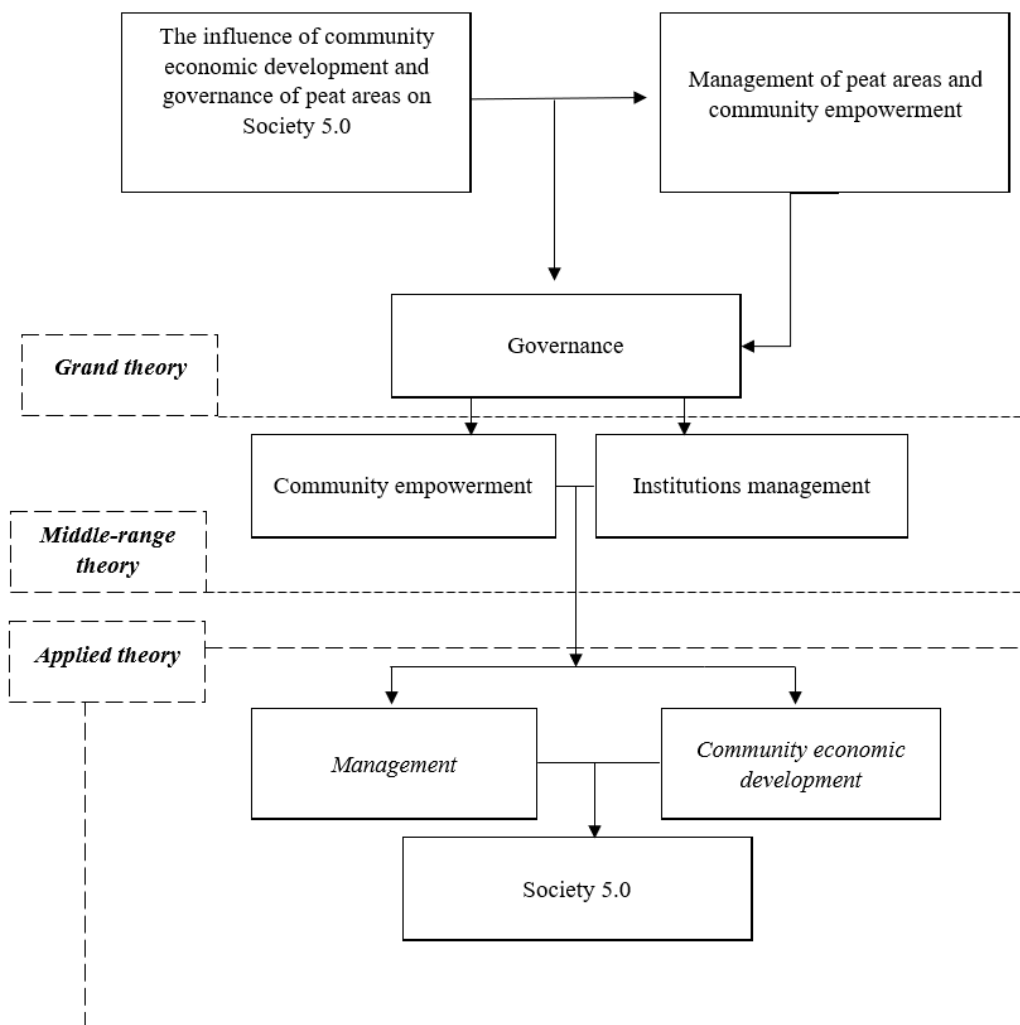


Figure 1. Research theory.

3. Results and discussion

The condition exists in aspect initiative agriculture horticulture in prosperous peat areas carried out by farmer groups in the Village Batang Duku, District Bengkalis, Riau Province. Several essential points that can be analyzed are:

- 1) Downstream agriculture in peat areas: highlights effort group farmers in developing agriculture horticulture on the land peat. Land peat has unique challenges, like poor drainage and lack of fertile ground. However, with existing assistance and education from PT Factory Pertamina International (KPI) Refinery Unit (RU) II Sungai Pakning, farmers can overcome problems and achieve results satisfying harvest.
- 2) The role of PT KPI RU II Sungai Pakning: PT KPI RU II Sungai Pakning is involved in helping farmers by providing education, technology, and facilities to increase productivity and efficiency in agriculture, giving training about technique match effective and efficient planting, use fertilizer organic, system good irrigation, and even making hydrant wells for anticipate fire land peat.
- 3) Sustainability and profits: blessings-friendly approaches to the environment like the use of fertilizer organics and engineering proper farming, a farmer in the village successfully increased results in harvest and income. Besides that, they also have succeeded process product derivatives from vegetables, like stick kale, which can be marketed and improved mark plus product.
- 4) Social and economical impact: these initiatives have positive impact on local society. The income of farmers increases, so the level of life for them has increased. Besides that, success also delivers pride and increases belief in farmers in developing farming on land peat.
- 5) The role of CSR: the program is done in PT Kilang Corporate Social Responsibility (CSR) framework Pertamina RU II Pakning River. This benefited the public and inspired villages and others in the region.

A condition exists. This shows potential and success in downstream agriculture horticulture in peat areas. Through the right approach, education, technology, and collaboration with the party-related, agriculture in peat areas can become more sustainable and benefit significant economic and social benefits to the local public. Studies about downstream agriculture horticulture in peat areas and its relation with Society 5.0 concept can face several problems necessary for scientific consideration. The following are several problems scientifically possible to arise in the study sort of it:

- 1) Drainage and water management: agriculture in peat areas is highly system-dependent on good drainage. The main problem is how to manage water efficiently and effectively so that puddles or droughts will not happen. The study must consider the suitable drainage method with a need for plant horticulture in peat areas and ensure that the system is sustainable and does not damage the environment.
- 2) Change climate: change climate can own an impact significant on agriculture and horticulture in peat areas. The study must notice how changes in climate moment and the future can

affect the production of plant horticulture in peat areas. Necessary to find ways appropriate adaptation and mitigation for guard productivity farms in the middle change climate.

- 3) Fertility: peat is the owning land characteristics unique. Fertility land peat tends to be low, and plant horticulture needs sufficient nutrition for optimal growth. Because that is, research must notice how to increase the fertility of land peat and provide the necessary nutrients for plant horticulture.
- 4) Election variety plants: the selection of varieties of plants suitable for horticulture with the condition of soil and climate in peat areas is problem important. The study must consider varieties of tolerant plants to condition peat and tolerance to acidity and abundance of water.
- 5) Technology and innovation: Society 5.0 includes application technology and innovation in all aspects of life, including agriculture. The study must consider How to integrate technology such as sensors, monitoring distance remote, and system automation in downstream agriculture horticulture in peat areas. Selection and use of the right technology can help increase productivity and efficiency in agriculture.
- 6) Engagement: the concept of Society 5.0 emphasizes the involvement active public in making decisions and implementing solutions. The study must consider how to involve public local, farmers, and stakeholder interests other in the planning and implementing downstream agriculture horticulture in peat areas. Their decision-making involvement can help society accept more sustainable, viable, and locally accepted solutions.

Downstreaming is an effort to increase the selling value of commodities, strengthen institutional structures, and improve the community's economy and business opportunities for residents. This is related to the ability of several villages with the same existing conditions do not have innovations in processing finished products or cannot yet produce special machines for processing raw materials and carrying out horizontal downstream processes. The simple downstream process can be seen at research loci that empower the community by cultivating citronella plants. Citronella cultivation to increase people's income through optimizing institutional potential and the potential of existing natural resources. Institutions are the main factor determining the success of community empowerment; in this case, based on empirical studies, Village Owned Enterprises (BUMDes) collaborate with partners as a downstream process in increasing the selling value of natural resources or village potential in the form of finished products processed by the local community (Local Wisdom).

In addition, there are also pineapple farmers' groups that are chosen as the main crop on peatlands because of the nature of the plant, which does not absorb much water and has a high production value. Today, groups have developed to become more integrated and institutionalized within cooperatives. They are using a planting technique known as "*Poligowo*" by combining the concept of "Polyculture". *Legowo* Agriculture Row is usually used for annual crops in forest areas. This program or idea helps farmers increase income through pineapple farming and maintain soil conditions to protect them from the risk of land fires. Furthermore, it was found that the idea of optimizing citronella cultivation on peatlands was also carried out by making downstream through refining citronella oil which can be used as raw material for making household products, such as cleaning products.

Several possible aspects of potency villages in peat areas in Bukit Batu District, Regency Bengkalis, are analyzed based on the data provided. Following are several analyses that can be done:

- 1) Distribution potency village: there are five categories of potency presented village in the data visualization, namely food crop farming, vegetable farming, plantation, farm, fishery, and fruit plants. From these data, food crop farming, vegetable farming, and plantation have amount the most numerous ten villages. This shows that part big villages in peat areas in Bukit Batu District have potency in agriculture plant food, agriculture vegetables, and plantations, as can be seen in **Figure 2**.

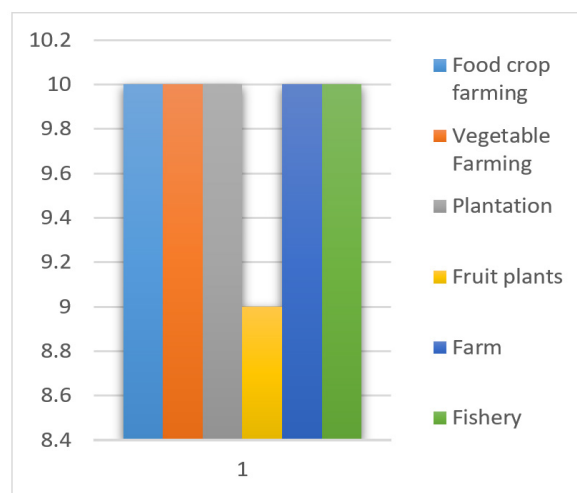


Figure 2. Village potential data visualization.

- 2) Potential fruit plants: as shown in **Figure 2**, the data visualization also mentions that nine villages have potential fruit plants. Although there is no explained type of fruit, what does it mean? This shows that several villages in peat areas in Bukit Batu District also have potency in agricultural fruits.
- 3) Area and population: Bukit Batu District has an area of 573.71 km² and a total residence of 21,531 souls. However, it is not explained how the site's location related to potency presented Village in the data visualization. More carry-on analysis can be done to see as far as potential villages spread in the region and how residents are distributed in it.
- 4) Livelihoods majority: most residents in the Bukit Batu District work as farmers. This data describe an essential sector of agriculture in local public livelihood. The link with potency village shows suitability between livelihood of majority residents with potency agriculture in peat areas.

3.1. Form institutional governance of smallholder agriculture in peat areas

Further analysis will be seen through an ideal governance template and a reference in relationships related to society's interests, as seen in **Figure 3**.

It can be seen through the governance model in **Figure 3**, in the governance context of agriculture horticulture in peat areas, analysis can be done through a governance template from

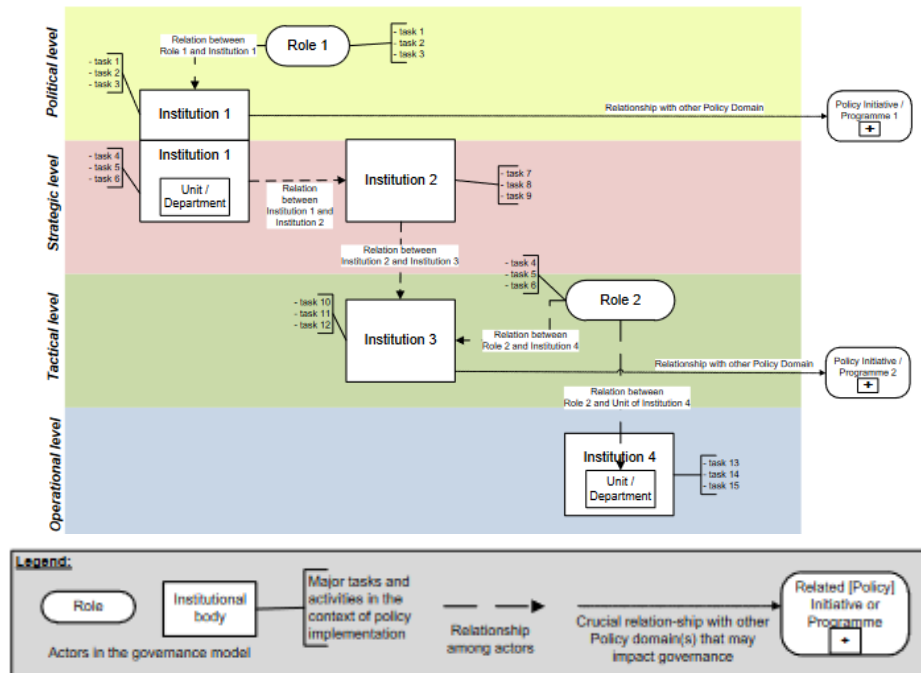


Figure 3. Governance template.

Source: Ludlow, 2018.

Commission Ideal Europe in Affairs Government to analyze several necessary aspects linked with governance agriculture horticulture in peat areas, among others:

- 1) The level at which the actors can function governance: analysis can be done related to the extent to which the actors are involved in governance agriculture horticulture in peat areas capable of operating a functioning government like political, strategic, tactical, and operational. This can include searching roles and responsibilities to answer each agency involved and to what extent they can fulfill governance functions at each level.
- 2) Types of main roles and responsibilities: analysis needs to be done to identify the roles and responsibilities of each institution involved in governance agriculture horticulture in peat areas. This can cover functions like planning, coordination, implementation, monitoring, and evaluation, and needs more to answer actors.
- 3) Relations between different actors: analysis can be done to understand the connection between different actors in governance agriculture and horticulture in peat areas. This covers the relationship between the actor on the political, strategic, tactical, and operational levels, as well hierarchy collaborative established governance structure resulting from the connection.
- 4) Covering documents governance structure: analysis must be done to protect documents governance structure in agriculture horticulture in peat areas. This can cover framework policy, framework law, framework interoperability, funding programs, and guidelines that become the reference in governance agriculture.
- 5) Linkages with initiative or other policy programs: Analysis can be done to see connections between governance agriculture horticulture in peat areas with industry or other relevant policy programs. This help understands each other dependency between related policies and

programs with agriculture horticulture in peat areas.

Through analysis of aspects, one can better understand the governance of agriculture horticulture in peat areas, and the extent of the governance template from Commission Europe can be applicable and relevant in context (Wimmer et al., 2018). Based on analysis through Horticultural Management theory on peatlands with indicators of Land Productivity and Risk of Failure. This is inseparable from the role of institutions in carrying out sustainable empowerment. Hudaya and Astuti (2020) describe that the development of terrestrial ecosystems is not only the government's task because the scope of terrestrial ecosystems is for the welfare of all humanity. Even though it has the resources, the government can only handle its continuous efforts. There needs to be the role of other actors, especially the community, to support the process of developing terrestrial ecosystems. Only some realize the importance of protecting terrestrial ecosystems. They are, furthermore, supported by research by Susilowati and Windiani (2018) with the same geography in this study that the need for assistance and coordination by actors in maintaining this potential to be developed so that it can become an independent community.

Table 1 comprehensively analyzes how Society 5.0 is implemented within peat farmers' institutions in the Bukit Batu District. Society 5.0 embodies a forward-looking societal concept that leverages the integration of technology to address intricate challenges and cultivate value across diverse sectors. The analysis delves into six pivotal indicators: solving problems and value creation, diversity, decentralization, toughness, sustainability, and harmony with the environment. The data used for this analysis originates from field research undertaken in the Bukit Batu District. This analysis provides an insightful panorama of the implementation of Society 5.0 within peat farmers' institutions in the same district. The analysis thoroughly examines the six indicators and clarifies how the amalgamation of technology and innovative practices reshape the agricultural landscape. The findings underscore the success of this implementation in effectively addressing local challenges, fostering collaboration, dispersing decision-making, bolstering resilience, and promoting sustainability, all while upholding harmony with the environment. The data drawn from field research adds depth and authenticity to the analysis, rendering it a valuable resource for comprehending the tangible repercussions of Society 5.0 in a real-world context.

Table 1. Implementation of Society 5.0 on peat farmers' institutions in Bukit Batu District.

Society 5.0	
Draft	Existing condition
Solving problems and value creation	Collaborating with partners (CSR, Academics) in creating innovations to increase productivity and effectiveness in cultivating pineapple and lemon grass, both from the aspect of the system and the right tools.
Diversity	Work in the form of institutional farmers integrated by local heroes/ agents of change.
Decentralization	There are benefits that the community receives from an economic perspective, and there is a delegation of authority from the village government to farmer organizations or BUMDes to carry out sustainable agricultural management.
Toughness	Have strong commitment and participation among residents to manage village agricultural institutions that are more advanced and useful.
Sustainability and harmony environment	The existence of environmentally friendly agricultural patterns, especially as an aspect of the sustainability of planting on peatlands.

Therefore, the concept of Society 5.0 emerged from the widely developed agricultural development, namely intelligent agriculture. Farmers must think innovatively and critically because Society 5.0 offers a human-centered society that balances economic progress with solving social problems. One example of smart agriculture is to use a technological system; in this case, the goal is to develop the agricultural sector and, over time, grow to love agriculture and want to farm in the agricultural industry. The linkages in this study can be seen in the willingness of the community to accept innovations and ideas related to machine downstream and partner cooperation; this can be seen through the BUMDes relationship pattern below:

Maintaining the sustainability and equitable aspects of the governance of community groups in Bukit Batu District can be carried out with the cooperation and initiatives of local heroes to develop their area; this was conveyed by Syahza, Kozan, et al. (2021). It was stated that group management was meant to be that way. The benefits received from the activity results are not only felt by individuals but can be felt by the majority of people who are members of one community group. Therefore, an efficient and rational process needs to be intensified to increase digitalization participation and productivity during the Society 5.0 transition; this statement is supported by the results of research by Hanifa et al. (2023), which produces SOP (Standard et al.) to be able to carry out the utilization of village services. The implementation of the digital Village is carried out in stages prepared in stages, only some at a time. Besides that, Mayarni et al. (2020) stated that the management of tourism and economic potential by the community in the Village provides the District's broadest opportunity to develop and improve the local community's economy. So these stages include various activities that require preparation and involve many parties. The village government and other parties, namely assistants from universities and third parties as digital innovation makers. This is supported by research by Záklasník and Putnová (2019). The perspective of community digitalization has three main aspects: government programs that support digital technology, the number of educated experts, and investment in science and research. So governance towards the ideal transition of Society 5.0 can be seen through this model in **Figure 4**.

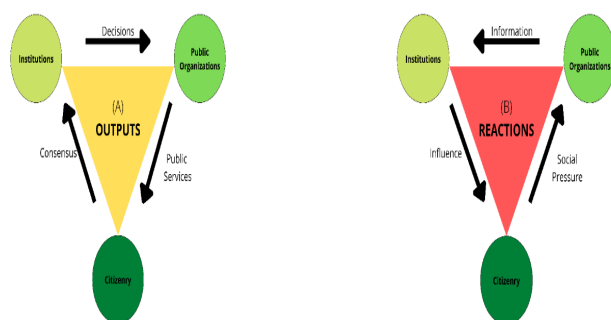


Figure 4. Governance framework.
Source: Nikiforova A (2021).

Based on **Figure 4**, it is known that there are two similar patterns with different direction schemes in the description of class actors described as citizens, institutions, and public organizations that can be integrated into a simplified “Governance Institutional” conceptual framework that describes the social life and behavior of actors. Only a few relevant characteristics are considered, namely the broader societal culture, which consists of ethical values, beliefs, behavior, and ways of interpersonal relationships. As for institutions, the framework considers only how efficient they

are, which means evaluating exclusively their ability to activate the socio-economic system to meet the needs of citizens with minor use of resources. Public organizations are characterized by their specific organizational culture, for example, legality and compliance with laws and regulations or management culture for specific organizational goals and variables. Different management tools are used, such as accounting systems, personnel policies, and management styles.

In the institutional form of horticultural farmers on peatlands, the level of education attained by farmers will influence the visible mindset and mindset. This can be seen in reasoning, using available resources, making decisions, and taking advantage of opportunities. In addition, education will determine the form of goals that each farmer will pursue in the business unit he makes. Some higher-educated farmers are business-oriented and use resources optimistically, while others only aim to meet their daily needs (Widodo et al., 2019). Therefore, the conceptual framework is presented in **Figure 5**, according to a triangular image showing the actors dynamically.

Observed clockwise, the schematic shows the actor's rational behavior and the resulting output. Since each person and group has their interests, the model assumes that citizens, as a whole, express their approval of these institutions through the election of representatives or ongoing social pressure from public opinion. In this case, Potočan et al. (2020) also mention that the problem that arises is that currently, the efforts made by this farmer group, especially in marketing and marketing management innovation, are still not optimal and require measures to increase knowledge. This supports theoretical concepts that involve various actors in realizing the empowerment process. Horticultural farmer institutions, such as the mechanism in **Figure 5** triangle, can also be read counterclockwise. Thus, it shows that the interaction between community actors influences the behavior of public entities through social pressure. They will ask for a high level of service or personal privileges. Institutions provide the information they need for their decision-making. Finally, citizens interact with institutions. As previously mentioned, institutions are shaped by society. However, at every point in history, there have been institutions whose citizens had no particular intention of being. On the other hand, observation of reality indicates that existing institutions are not neutral toward people's behavior. Therefore, we need other indicators that can trigger the development of farmer institutions in peat areas, along with the framework from the results of this study which can be seen in the image below:

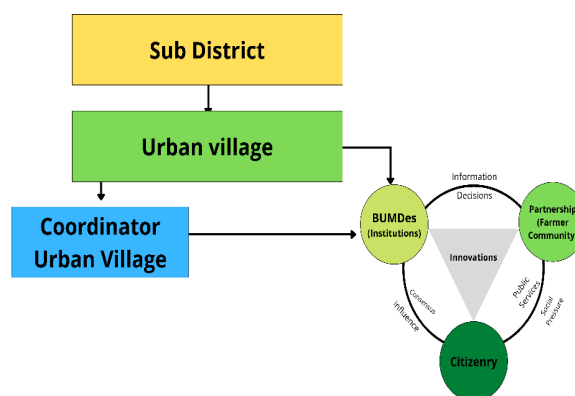


Figure 5. Farmer institutional governance framework in peat areas.

Based on **Figure 6**, it is known that when institutions are efficient and provide community services, they can handle business and work. In the end, inefficient institutions will hurt community groups and significantly reduce the community's morale. Then the function of innovation, which is the main point in institutional implementation, can improve relations between actors, namely BUMDes or farmer organizations, farmer group partners, and local communities, which become one unitary cycle. While on the external aspect, there is a vertical relationship between the District and the Kelurahan, so the Kelurahan becomes a link between the Kelurahan coordinator and the Farmer's Institution, which can interact through different cycles. This is considered ideal because institutional independence can accelerate cooperation and increase community participation through direct relationships that are more efficient in collaborating in program implementation, but this becomes crucial when government actors become passive both in monitoring and coordinating institutions or communities.

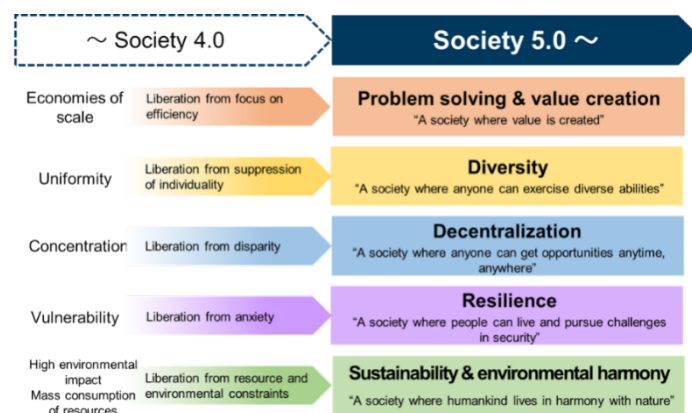


Figure 6. Comparison of the transition from Society 4.0 to Society 5.0 concept.
Source: Nakanishi (2019).

This is supported by the research of Ferreira and Serpa (2018), which states that horticulture aims to develop gardens, nurseries, enclaves, and farms to increase the economic benefits of horticulture, which requires skills and strong community relations. Therefore, **Figure 6** shows that the conceptual framework presented is dynamic between actors in the aspects of decisions, and information dissemination, in terms of decision consensus and influencing participation, public services, and social pressures arising from connectivity, between actors in empowering horticultural farmers in peat areas. Therefore, Society 5.0 has contributed to the SDGs, which offer a governance approach with principles to complement mainstream regulatory approaches which emphasize role creation with an emphasis on compliance and enforcement. Therefore, the research results in **Figure 6** above explain the differences in the pattern of theoretical aspects of institutional governance and implementation in the field.

3.2. The influence of community economic development and peatland management on Society 5.0

Community development is a social activity that seeks to improve the community's quality of life by empowering them by emphasizing the principle of social participation. It is carried out with a community development process that begins with growth theory, namely the growth of program principles, objectives, and priorities based on assessing community needs. Community development

incorporates the notions of “community and development where the concept of the community revolves around a group of people with a shared identity”. Community development depends on interactions between people and their collective actions rather than individual activities. To realize Society 5.0, it is necessary to have education and equity in regional development. Every country shares these two aspects in advancing its territory (Deguchi et al., 2020).

Society 5.0 is no longer about situations that adapt to environmental needs but about how people try to restore environmental conditions. Innovation is a product and can drive the necessary (good) changes in all areas of society (Hysa et al., 2021). Furthermore, social media is a tool that can provide access to information widely, especially in promoting something like tourism. Social media is a new trend in delivering promotions related to opportunities or opportunities that consumers can accept without having to conduct direct inspections of the location they want to go to. This is one way to improve the economic level of the industry (Hudaya and Astuti, 2020).

Humans are expected to have a rich imagination to identify various needs and challenges spread in society and scenarios for solving them, as well as creativity to realize these solutions using technology and digital data. Society 5.0 will become the society of imagination, where digital transformation combines with the invention of diverse people to learn “problem-solving” and “value creation”, leading us to sustainable development. This is a concept that can contribute to the achievement of the Sustainable Development Goals (SDGs) adopted by the United Nations (UN) (Hák et al., 2016). To realize the aspect of sustainability, the institutional governance of horticultural farmers also involves other actors, such as the CSR (Corporate Social Responsibility) program of PT Pertamina International RU II Sungai Pakning refinery, which helps increase the activity and participation of the local community. CSR is expected to help the community’s environment meet their primary, secondary, and tertiary needs. Immediate needs can be met by opening job vacancies for unemployed individuals, helping existing facilities and infrastructure in the Village, and providing community quality improvement programs through empowering rural communities (Farazmand, 2023).

This is supported by research by Widodo et al. (2019) that to measure community satisfaction with the CSR program, it is necessary to increase the community’s economy by activating community groups. Community satisfaction reached 40%, which explains that many people still need to feel the impact. Yunginger and Dako (2021) describe that even though activities that have developed community potential have been carried out, there is a need for a follow-up program to be able to create the SDGs program that was implemented previously. Based on the background of the existing conditions and efforts to improve the economy of the people in Bukit Batu District, through observation and interviews, several indicators were found that triggered the transition to the Society 5.0 era, namely:

- 1) The emergence of innovation in optimizing agricultural land through the *poligowo* system, where Purwanto et al. (2022) said that pineapple was chosen as the main crop on peatlands because of its low water absorption and high production value. Today, groups have developed to become more integrated and institutionalized within cooperatives.
- 2) The emergence of innovations in using citronella as a raw material for processed home products such as soap, mosquito repellent lotion, hand sanitizer, and others through a simple distillation process using a suitable artificial machine.

Based on the data presented, the study results show that quantitative analysis based on the theory of Mayarni et al. (2020) uses several indicators such as Problem Solving & Value Creation, Diversity, Decentralization, Resilience, Sustainability & Environmental Harmony. This study used an analytical test with SPSS to produce some interpreted calculation results. The calculation's constant value (a) results show that the constant value (a) is 38.305. When all independent variables are assumed to be zero (0), then Society 5.0 has a value of 38.305. This value can be considered the baseline or initial value of Society 5.0. Regression coefficient for the management variable (X1) and community economic development variable (X2): the calculation results show that the regression coefficient for the management variable (X1) is 0.298, while for the community economic development variable (X2) is 0.315. That is, every one-unit increase in the management variable (X1) and the community economic development variable (X2) will increase Society 5.0 by 0.298 and 0.315, assuming other variables are constant. In its conclusion, this study concludes that management and community economic development variables positively influence Society 5.0. This study uses quantitative analysis and calculation results from the SPSS analysis test to support this conclusion.

This proves that each indicator will be interconnected if it significantly influences one another; quoting Bonye et al. (2013), community empowerment is defined as an economic development concept that encapsulates social values. This concept reflects a new development paradigm: human-centered, participatory, empowering, and sustainable. Therefore, horticultural management on peatlands and indicators of land productivity and risk of failure. Primahardani et al. (2022) describe that empowerment programs needed by community groups include production and operations management training, supply chain management training, digital marketing training, production and product development training, and marketing management training and involved stakeholders. This will be a follow-up study in observing indicators of land productivity against the risk of failure. So from the conclusion of the question study, two necessary aspects are analyzed: the influence development of economy society and governance land peat towards Society 5.0. First, there is an influence development economy public towards Society 5.0. It says that the empowerment public in context development economy reflects the paradigm of new human-centered, participatory, empowering, and sustainable development. This shows that development involving economic participation, active community, and empowerment can contribute to forming Society 5.0. Development economy public can cover training management production and operation, management chain supply, digital marketing, production and development product, management marketing, and stakeholder interests.

Second, there are governance influence land peat towards Society 5.0. In the context of management horticulture on land peat, indicator productivity land and risk failure become the focus. The study conducted by Primahardani et al. (2022) suggested that empowerment is a public matter. This needs training related to management production and operations, chain supply, digital marketing, production and development product, and managing marketing and stakeholder interests. This shows that the governance of excellent and effective peat, with notice aspect productivity land and mitigation risk failure, contributed to the formation of Society 5.0. Overall, analysis from paragraph the show that the development of economic society and governance of land peat influence the formation of Community 5.0. Empowerment public through the development of sustainable and participatory economics, and governance of land goods peat, can support transformation towards

Society 5.0. Continuity analysis from the study about the influence of development of economy society and governance of peat areas against Society 5.0 is as follows:

- 1) Potency community economic sustainability: this study highlights the influence of the development public economy against Society 5.0. In the context, this continuity analysis covers evaluation to potency period long from development sustainable economy, which can contribute positively to the transformation public to become Society 5.0. In a study, this is necessary to analyze how the development of sustainable economy can trigger inclusive growth, reduce the gap, and create field-quality work.
- 2) Management of peat area governance: this study also evaluates the influence of governance of peat areas against Society 5.0. Continuity analysis involves evaluation to effort for management of sustainable peat areas, protection of environment, preservation of nature power source, and application of renewable technology. Sustainable management will support the creation of conducive conditions for the implementation of Society 5.0, such as a friendly infrastructure environment, usage of renewable energy, and efficient water management.
- 3) The synergy between economic development and management of peat areas: this study analyzes how the development of the economy, society, and governance of peat areas can each other interact and support the realization of Society 5.0. Continuity analysis will notice integration between aspects of the economy and environment in development strategy. The excellent synergy between the development of an inclusive and sustainable economy with good management of peat areas will strengthen the public ability to adopt renewable technology, improve the quality of life, and achieve development objectives sustainably.
- 4) Social and environmental impact: sustainability analysis also involves evaluating social and environmental impacts from development of economics and governance of peat areas on society. In the context of Society 5.0, it is crucial to notice aspects of culture like digital inclusion, empowerment community, and participation activities in making decisions. Besides its impact on the environment, like house gas emissions, glass, damage environment, and preservation of biodiversity are also necessary to be analyzed for development of economics and governance of peat areas can be sustainable.

The absence of institutions and governance can negatively impact farmer groups in the era of Society 5.0. Some potential adverse effects are: (1) limited access to resources: with proper institutional support and governance mechanisms, farmer groups may access essential resources such as land, water, seeds, and technology. This can hinder their ability to adopt advanced agricultural practices and technologies associated with Society 5.0. (2) Lack of coordination and collaboration: institutions and governance structures are crucial in facilitating coordination and collaboration among farmer groups. In the absence of effective institutions, there may be a lack of coordination between different stakeholders, resulting in missed opportunities for knowledge sharing, joint initiatives, and collective decision-making. (3) Weak representation and advocacy: institutions provide a platform for farmers to voice their concerns and advocate for their rights and interests. With proper institutional mechanisms, farmer groups can effectively represent their needs and negotiate favorable policies and support from the government and other stakeholders. (4) Limited access to markets: institutions and governance structures are vital in facilitating market linkages and ensuring fair prices for agricultural products. The absence of such institutions can lead

to limited market access for farmer groups, resulting in reduced profitability and economic viability. Furthermore, inadequate support and capacity building: institutions often provide support services and capacity-building programs to enhance the skills and knowledge of farmers. The absence of institutional support can lead to limited access to training, information, and technical assistance, preventing farmer groups from effectively harnessing the benefits of Society 5.0 technologies and practices. Overall, the presence of institutions and governance will help the progress and development of farmer groups in embracing the principles and advancements of Society 5.0. Establishing effective institutions and governance structures becomes crucial to address these challenges and provides the necessary support for farmer groups to adapt and thrive in the era of Society 5.0.

4. Conclusion

Based on an analysis of the qualitative and quantitative condition of the existing community in Bukit Batu District, several results give a description positively related to the development of Society 5.0. It shows that Society 5.0 is experiencing a phase transition and exists potency for maximizing the utilization of renewable technology. Observations and interviews show that role institutions (BUMDes) are crucial in increasing the potency achievement of Society 5.0. Through connected networking through BUMDes, exemplary aspect partnership and implementation of sustainable programs can contribute significantly. According to the research results, it recommends governance ideal framework institutions (BUMDes) in Bukit Batu District as case studies, which can become the reference in future studies. Besides that, research also reveals that Society 5.0 is one indicator of SDG supporters in the positive governance paradigm. Continuity analysis from the survey about the influence of economy society and governance of peat areas against Society 5.0 is studied. This discloses that the role of governance of peat areas is essential in achieving Society 5.0. This emphasizes the importance of management of sustainable area and peat-based public as a step towards Society 5.0. In the sustainability analysis, measures, policies, and collaborative efforts must be made to ensure the governance of sustainable peat areas in support of development of Society 5.0. In the framework, it is necessary to increase continuity of the study. This is important for taking considerate steps, continuing the investigation, and collaborating with related parties, including the government, society, and the private sector.

Author contributions

Conceptualization, MA and AS (Almasdi Syahza); methodology, AS (Almasdi Syahza); software, SHS; validation, SHS, AK, and AS (Almasdi Syahza); formal analysis, EH; investigation, SHS; resources, AK; data curation, MM; writing—original draft preparation, MSN; writing—review and editing, MSN; visualization, EH; supervision, AS (Andri Sulistyani); project administration, MM. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict

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