

Collaborative Governance on the Smart City-Based Regional Development of Balikpapan

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Abstract

There are three challenges in building a *smart city*: technology, human resources, and government. A collaborative climate must be created to meet these challenges. The policy direction and the application of collaborative governance in developing a *smart city* in Balikpapan City, East Kalimantan, Indonesia, are described here. This study used the *collaborative governance* approach to dissect this research. This type of research is qualitative, and descriptive methods are used. Information is obtained based on the *smart city policy plan* adjusted to the regional Medium-Term Development Plan and the draft document for the *smart city master plan for the city* of Balikpapan. Researchers conducted in-depth interviews with several parties from the local government involved in the *smart city implementation council*. Meanwhile, research supporting data was conducted based on searching various information from online sources, scientific articles, research journals, and several literary sources. The focus of the development of the *smart city of Balikpapan City* is directed at developing a livable city based on a sustainable environment. *Collaboration with Pentahelix*, which is interdependent, is a prerequisite for the successful development of a *smart city* in which the vision of the mission of the City of Balikpapan is supported.

Keywords: collaborative governance, regional development, smart city

Introduction

The implementation of sustainable development is faced with various global problems, such as increasing population growth, reduced availability of residential land, congestion on highways, increased crime rates, swelling levels of energy usage, waste accumulation, and various other social problems (Conoras & Himmawati, 2018). These problems are triggered by population growth, which is mainly concentrated in urban areas and implies the adaptation process of cities to meet the minimum needs of their residents. Experts argue that urban challenges and problems cannot be solved conventionally. Smart city policy is considered a solusible approach to realizing a sustainable city (Firmanyah et al., 2017) through digital ecosystem collaboration. Still, policy development can improve the quality of life of people (deGuimarães et al., 2019).

In Indonesia, the smart city concept was seriously discussed at the E-Indonesia Initiative (EII) and Smart Indonesia Initiative (SII) conferences held by the Ministry of National Development Planning/National Development Planning Agency (Bappenas) in 2015. The direction of smart city

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development is based on national urban area development policies and is scheduled to achieve sustainable development goals. The development of a sustainable smart city includes inclusive socio-cultural environment development, economic growth that prospers the community, and environmental protection and management with the support of political commitment and involvement from various stakeholders (Joga, 2017).

The trend of smart city development began with the 100 Smart City Movement by the government through the Ministry of Communication and Information as the leading sector (Perdana, 2020). The preparation of the master plan and the quick win of the 100 regencies/cities were conducted over three years. In 2017, 2018, and 2019, a total of 25, 50, and 25 regions were considered, respectively. The 100 selected regencies/cities are expected to become role models for implementing smart cities for other cities/regencies (Rizkinaswara, 2020). At the implementation level, the regions that received smart city technical guidance were 24 regencies/cities in 2017 appear in Table 1. Smart city with 50 regencies/cities in 2018 is Table 2, and for 25 regencies/cities in 2019 is seen in Table 3 (Rizkinaswara, 2018).

Table 1

Regencies/Cities Receiving Smart City Technical Guidance in 2017

No	Regency/City	No	Regency/City	No	Regency/City
1	City of Samarinda	9	City of Bekasi	17	Sidoarjo Regency
2	City of Tangerang	10	City of Jambi	18	Bojonegoro Regency
3	City of South Tangerang	11	City of Sukabumi	19	Badung Regency
4	City of Makassar	12	Lombok Timur Regency	20	Siak Regency
5	City of Tomohon	13	Kutai Kartanegara Regency	21	Mimika Regency
6	City of Bandung	14	Banyuwangi Regency	22	Gresik Regency
7	City of Cirebon	15	Banyuasin Regency	23	Sleman Regency
8	City of Bogor	16	Pelalawan Regency	24	Semarang Regency

Source: <https://aptika.kominfo.go.id/2018/11/gerakan-menuju-100-smart-city/>

Balikpapan is the second-largest city in East Kalimantan Province and the most significant economic center in Borneo. The city has been growing rapidly with the arrival of various multinational companies, thus making it an industrial city. This, in turn, impacts the rapid economic growth of Balikpapan. The city was selected in 2019 as one of the regions that participated in the 100 smart city movement. The local government has begun to review various policies to support the program and also explores multiple information regarding regional readiness in implementing smart city development. Such support involves human resources, application planning, budgeting, the condition of infrastructure and smart city superstructure, and the commitment of the head of the local government (Maulana, 2019).

Table 2*Regencies/Cities Receiving Smart City Technical Guidance in 2018*

No	Kab/City of	No	Kab/City of	No	Kab/City of
1	Jember Regency	18	Kendal Regency	35	Pemalang Regency
2	Jeppara Regency	19	Blora Regency	36	City of Surabaya Regency
3	Magelang Regency	20	Blitar Regency	37	Indramayu Regency
4	City of Denpasar	21	City of Manado	38	City of Medan
5	City of Pontianak	22	City of Pekalongan	39	Bantul Regency
6	City of Pekanbaru	23	City of Sibolga	40	Pasuruan Regency
7	City of Surakarta	24	City of Banjarmasin	41	Sumenep Regency
8	Sukoharjo Regency	25	City of Banjarbaru	42	Cirebon Regency
9	City of Palembang	26	City of Padang	43	Morowali Regency
10	Muara Enim Regency	27	Solok Regency	44	City of Padang Panjang
11	City of Musi Banyuasin	28	Bogor Regency	45	City of Mataram
12	Bandung Regency	29	City of Probolinggo	46	Sumbawa Regency
13	Cimahi Regency	30	Luwu Timur Regency	47	Kutai Timur Regency
14	Tuban Regency	31	City of Yogyakarta	48	Grobogan Regency
15	Batang Regency	32	Lamongan Regency	49	Kulonprogo Regency
16	Pati Regency	33	Deli Serdang Regency	50	Binjai Regency
17	Boyolali Regency	34	Langkat Regency		

Source: <https://aptika.kominfo.go.id/2018/11/gerakan-menuju-100-smart-city/>

Table 3*Regencies/Cities Receiving Smart City Technical Guidance in 2019*

NO	Kab/Kota	No	Kab/Kota	No	Kab/Kota
1	City of Ambon	10	City of Kediri	19	Regency of Klaten
2	City of Balikpapan	11	City of Magelang	20	Regency of Padang Pariaman
3	City of Banda Aceh	12	City of Madiun	21	Regency of Situbondo
4	City of Batu	13	City of Tanjung Pinang	22	Regency of Sragen
5	City of Bontang	14	Regency of Banjar	23	Regency of Tangerang
6	City of Cilegon	15	Regency of Banyumas	24	Regency of Tabalong
7	City of Depok	16	Regency of Demak	25	Regency of Wonosobo
8	City of Jayapura	17	Regency of Gunung Kidul		
9	City of Kupang	18	Regency of Kebumen		

Source: <https://www.tribunnews.com/nasional/2019/05/15/memasuki-tahun-ke-3-gerakan-menuju-100-smart-city-pilih-25-kotaRegency-of-untuk-proses-pendampingan>

The smart city program in Balikpapan began with the implementation of a four-stage technical guidance. This activity resulted in the establishment of a smart city council and an implementing team, the formulation of supporting documents (e.g., strategic analysis, master plan, and executive summary of smart city), and the signing of a joint commitment to support smart city implementation by all regional apparatuses in Balikpapan. The program-supporting documents were prepared to represent a cross-sectoral analysis, policy modeling and simulation, and the delivery of communication mechanisms to all stakeholders (Tan & Taelhagh, 2020).

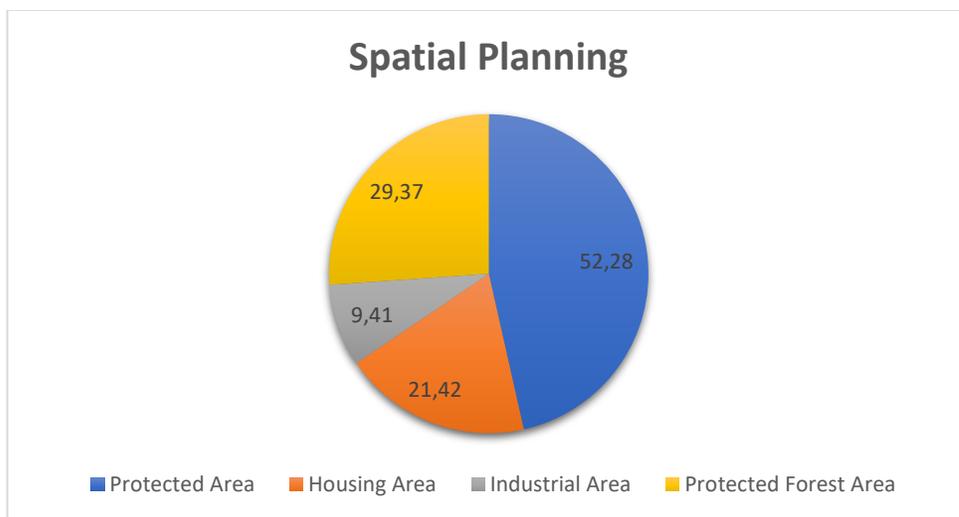
The Most Livable City is the vision of the Balikpapan Smart City program. Its primary mission is to build synergy toward an environmentally friendly smart city (Balikpapan Smart City Preparation, 2019). Environmental issues are clearly described in the smart city vision and mission statement, which was adjusted to the RPJMD of Balikpapan City (2019). This commitment to

building an environmentally friendly city plan may be observed in urban spatial planning, dominated mainly by protected areas (Figure 1).

The figure indicates that the area used for protected areas was 52.28% (26,316.28 ha). Meanwhile, 47.41% (24,041.14 ha) of land was used for cultivation areas. Residential areas occupied 21.42% (10,779.86 ha), and industrial areas occupied 9.41% of the total area (4,736.99 ha). The other spatial planning was designated as a protected forest area, with a projection of 29.37% (14,781.49 ha).

Figure 1

Balikpapan City Spatial Planning Based on RTRW 2012–2032



At the implementation level, the smart city concept requires communication technology systems in daily governance. However, the success of the smart city program is not only analyzed based on the use of communication technology alone. There are three challenges in implementing the smart city concept: technology, human resources, and the government. Therefore, a collaborative climate must be created to face these challenges (Sanjaya et al., 2018).

Following Ansell & Gash (2007), the collaborative governance approach is used in this study to see the joint efforts between the government and various stakeholders to work together in collective decision making, formal and consensus-oriented, deliberative, and aimed at making and managing development policies or programs (Islamy, 2018). In the context of the Smart City of Balikpapan, a very supportive ecosystem is needed to encourage citizen participation, education on the emergence of various digital-oriented innovations, and encourage a climate of collaboration

between the public and private sectors in realizing the smart city vision and mission (Tan & Taeihagh, 2020).

Literature Research

Collaborative Governance

The basis for the transformation of management and governance is provided by globalization and technological advancement, especially in governmental fields. Changes regarding a more innovative government in the 21st century are brought about by decentralization, public policy, information, and communication technology (Omodan, et. al., 2021). The process of globalization emphasizes increasing the usage of advanced technology, adding more job opportunities and economic integration (Espino et al., 2020; Hoe et al., 2021; Wolhuter & Jacobs, 2021). Future decentralization is an innovative process marked by the decreasing role of the government as the sole provider of resources and the increasing use of developing economic advancement instruments and private resources (Kapucu et al., 2009).

In recent decades, experts have observed a reform in the public sector that has shifted from the administrative state toward new governance. This reform has impacted the emergence of new forms of government that replace managerial modes of policymaking and implementation (Islamy, 2018). This approach was later referred to as collaborative governance, by which multiple stakeholders were brought together with public bodies to engage in consensus-oriented decision making (Ansell & Gash, 2007).

Ansell & Gash (2007) argued that collaborative governance is a governance arrangement in which one or more public institutions directly involve non-state stakeholders in a formal decision-making process. Such a process is collective, consensus-oriented, and deliberative, aiming to make, implement, and manage public policy. Several characteristics can be formulated based on the definition of collaborative governance, such as: (1) The forum is initiated by actors in public institutions, (2) Forum participants include non-state (non-public) actors, (3) Participants are not only involved in the consultation process but are also directly involved in the decision-making processes, (4) The forum is official, (5) The forum is aimed at reaching a consensus, and (6) The forum is more focused on collaboration in policymaking and public management.

The government cannot rely solely on its internal capacity to implement public policies. This is due to limited capabilities, resources, and networks as supporting factors for implementing public policies (Budiharso, et. al., 2022). Collaborative governance needs to be developed by encouraging

collaboration among government, private, and community institutions, and the wider community to achieve the objectives of implementing these public policies (Purwanti, 2016). The success of collaborative governance is characterized by increased government accountability, great community involvement, consistent downstream implementation, and the success rate of development processes and programs (Johnston et al., 2010).

Purnomo et al. (2018) suggested that the process and structure of public policymaking and governance are challenging to formulate alone. Therefore, through a collaborative governance approach, government management is needed as a process of facilitation and implementation by various public, private, NGO, community, and societal institutions to solve public problems that cannot be handled only by government institutions. However, collaborative governance is influenced by creating a climate of deliberation that fosters trust, commitment, accountability, and willingness to share risks (Johnston, 2010).

As a new form of governance, several values have become the base characteristic of collaborative governance (Kurniadi, 2020), as shown below:

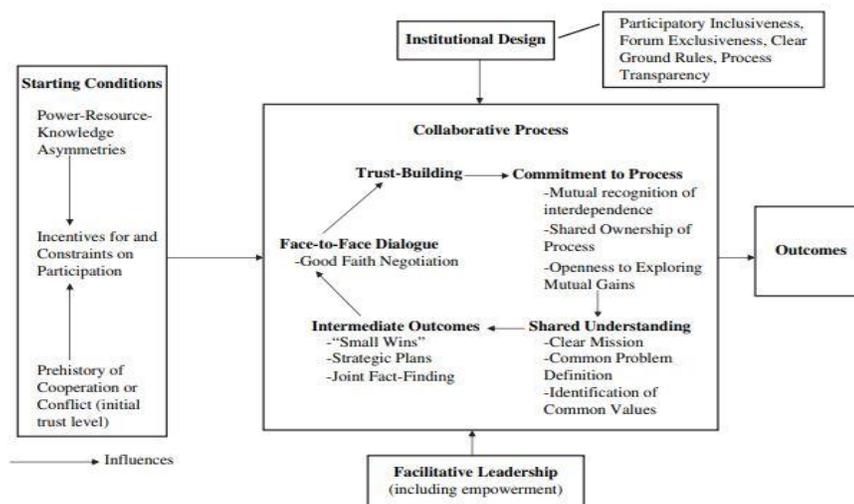
1. Consensus-oriented: multi-section collaboration-based relationships tend to be more prone to conflict; therefore, a consensus is a basic need that must be executed;
2. Collective leadership: in the context of collaboration, leadership is in the form of a network, assuming that each party is in the same position. The position of collaborating actors is structurally the same, and the line of coordination is not vertical.
3. Multidirectional communication: communication is the core of a collaborative process and is a subsystem of policy implementation. Communication is an indicator for assessing the extent of the collaboration stages (e.g., exploration, formulation, growth, maturity, and ending).
4. Sharing resources: the capacity of the collaboration can be seen in the extent to which collaborating actors can share resources (e.g., human resources, finance, etc.). It is expected that collaborating actors can strengthen each other through sharing resources, complimenting their strengths, covering their weaknesses, and being actively involved in acting together.

Based on the collaborative governance model proposed by Ansell & Gash (2007), there are several stages in which collaborative governance begins. The process requires initial mapping conditions, institutional design, facilitative leadership, and collaboration.

The starting condition stage is conducted to identify and analyze power-resources knowledge asymmetry, a high gap in power and strength, knowledge resources or incentives, and obstacles to participation. If the owned resources and strengths are not balanced, there can be a tendency for manipulation conducted by stakeholders with extensive resources and strengths (Purnomo, 2018). The institutional design stage is a form of mutual support and commitment to a collaborative process to encourage participation and transparency. The nature of the institution must be open, and attention must be paid to institutional collaboration forums and transparent collaboration processes (Islamy, 2018).

Facilitative leadership is critical to developing stakeholder involvement in one unit, bringing them close, and uniting them in a solid cooperative relationship. Facilitative leadership plays an essential role in maintaining the rules of the game in a collaboration process, building trust, facilitating dialogue, and exploring mutual benefits (Purnomo, 2018).

Figure 2
Collaborative Governance Model by Ansell & Gash (2007)



The last stage in the model by Ansell & Gash (2007) is collaboration. The collaboration process is translated into several features, such as face-to-face dialogue, building mutual trust, a strong commitment to the collaboration process, sharing the same understanding, and obtaining at least minimal achievements from the collaboration process.

Smart City

The smart city concept arises when population growth and resource scarcity become so critical that finding a solution is urgent. A city is considered “smart” when it is built to achieve strong social capital, improved infrastructure (both traditional and modern), and promote an improved quality of life, sustainable economic growth, and wise resource management through collaborative governance (Palacios, 2020)

The Ministry of National Development Planning (Bappenas) built the concept of a future city through sustainable city development in 2015–2045 based on several pillars: (1) livable, safe, and comfortable cities, (2) a green city that is climate and disaster resilient, and (3) smart and competitive cities based on technology and culture (including economy, governance, infrastructure, environment, community, and housing (Djunaedi et al., 2018). There are several pillars in the Smart City Dimension shown in Table 4.

Table 4
Smart City Pillars

Smart city pillar	Notes
<i>Smart governance</i>	This pillar covers participation in decision-making, public and community services, transparency in governance, public strategy, and policy.
<i>Smart environment</i>	wise usage of natural resources: elements of natural condition attraction, pollution, environmental sustainability, and sustainable resource management.
<i>Smart economy</i>	this pillar focuses on innovation, entrepreneurship, economic branding, image branding, productivity, job market flexibility, international connectivity, and the ability to transform.
<i>Smart people</i>	Emphasizing social capital and human resources includes qualification levels, willingness to continue learning, social and ethnic plurality, flexibility, creativity, open-mindedness, and participation in public life.
<i>Smart mobility</i>	This pillar is related to transportation and information and communication technology (ict). It includes elements of accessibility (e.g., local, national, and international), the availability of ict infrastructure, and a sustainable, innovative, and safe transportation system.
<i>Smart living</i>	Relates to the quality of life, such as cultural facilities, health conditions, personal safety, housing quality, educational facilities, tourism attractiveness, and social cohesion.

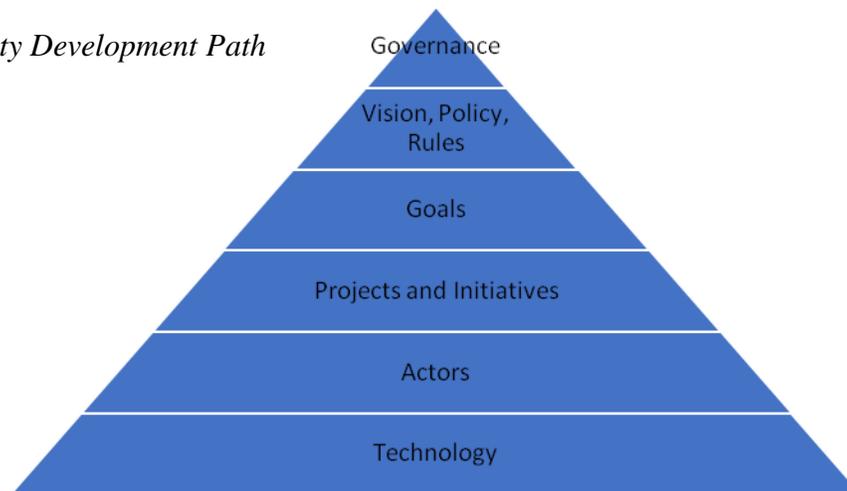
Source: Djunaedi (2018).

Applying the smart city concept can be challenging to implement as a phenomenon of solving urbanization problems. There are at least three challenges in developing a smart city: technology, government, and human resources. Building a smart city requires considerable financial investment and an ICT infrastructure. As a driving actor, the government needs a collaborative

atmosphere to implement a smart city. However, the success of a smart city also depends on the existence of smart people or intelligent communities to support the government and the technology that helps the smart city (Sanjaya et al., 2018).

It can be said that the Smart City phenomenon must be considered in a bottom-up context. The growth path and consolidation of top-down and bottom-up smart city development are described in figure 3.

Figure 3
Smart City Development Path



Source: Damaeri (2013).

Based on Figure 3, the primary driver of the birth and development of smart cities stated in the Smart City Development Path is technology (especially ICT). Various collaborative actors in urban areas are connected by technology, which also supplies digital services for collaborating public and private institutions. It is also explained in the figure that universities, research institutes, and different technology-based companies are the main collaborative actors who can develop smart city ideas through their competencies. A solution approach to support an improved urban life in an initiative, work, and program innovation may be designed by collaborating actors.

The smart city vision must be defined by considering the strategic vision of the city and the cultural, geographical, and economic characteristics of each city. The smart city vision must be built through a common process involving all stakeholders and based on policies and rules to achieve common goals. The smart city development initiative is focused on technology-based urban management and how technology can create value for the community as a subject in the program.

Research Methods

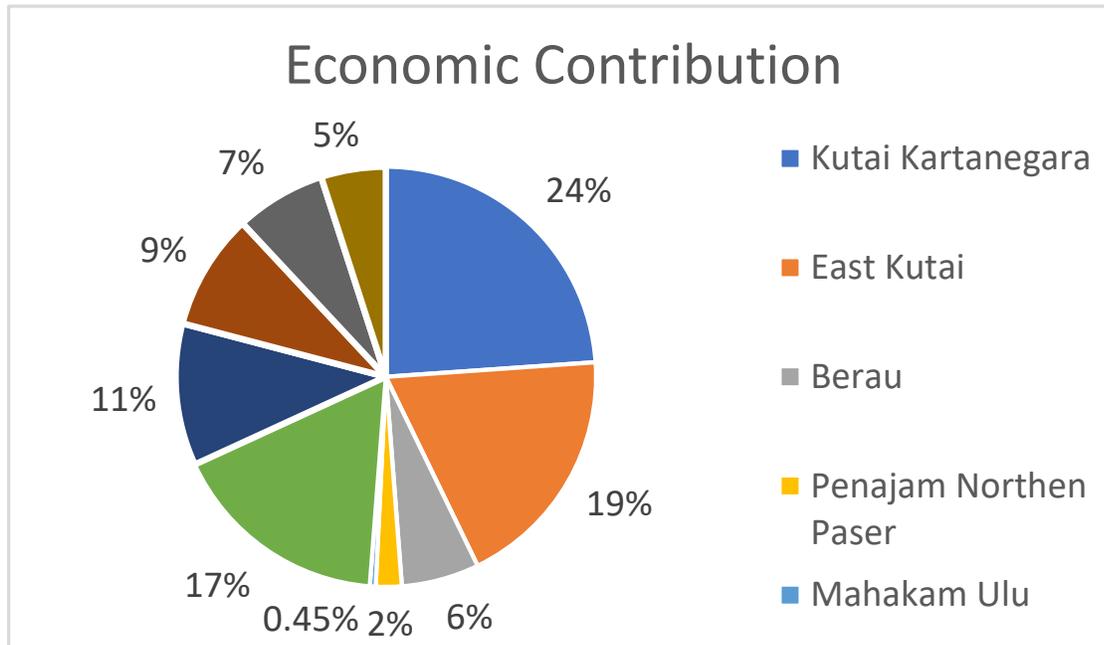
A descriptive qualitative approach is used in this study, emphasizing several research focuses on describing the direction of the smart city policy in Balikpapan. The roles of various collaboration actors and the collaborative governance of smart city-based regional development are highlighted. The researchers chose parties from the city government as informants, considering that the government is the leading sector in the smart city program. A number of 8 research informants were selected with criteria as parties involved in the council and the implementation team for the smart city development program of the city. Additionally, the researchers used secondary data by conducting various new research studies regarding the involvement of various external parties to support local governments and conducted a literature review relevant to the theme of the study. The study results are directed to answer the research objectives and are conducted in several stages. Content analysis by Zhang & Wildemuth (2016) was used for data analysis in this study combined with collaborative governance approach from Ansell & Gash (2007). In the first stage, the researchers described the potential and advantages of Balikpapan to become a livable smart city, following the smart city vision to be achieved. In the second stage, researchers explained smart city regulations and policies implemented to support the RPJMD for Balikpapan. The strategic analysis of smart city development was based on several smart pillars, such as governance, economy, environment, living, branding, and society. The third stage was smart city collaborative governance, which consisted of the roles of collaborative actors and the smart city collaboration process. This was analyzed based on the collaborative governance approach proposed by Ansell & Gash (2007).

Results and Discussion

Balikpapan, the Most Livable City

Balikpapan, the second-largest city in East Borneo Province, has grown rapidly due to the entry of various multinational companies operating in the city. This city was known as the “Oil City” (*Kota Minyak*) in the past as a reference to the development of its oil production, which reached 26,000 barrels per day. The development of the oil industry has made Balikpapan an industrial city. The economy in Balikpapan is responsible for 17% of the economy in the East Borneo Province. Balikpapan is the third largest city in the province, after Kutai Kertanegara and East Kutai (Figure 4).

Figure 4
GRDP Contribution of Cities/Municipal in Borneo



Source: RPJMD of Balikpapan city 2021-2026

During its development, this city no longer focused on exploring petroleum products. Still, it is more directed as a dynamic, harmonious, and green service city to support its function as a national growth center based on the 2012–2032 Balikpapan City Spatial Plan (*Rencana Tata Ruang Wilayah*; RTRW).

The rapid development of the city, which is in the middle of trans-Borneo and trans-national transportation networks, allows Balikpapan to be in a significant and strategic position internally and externally. Balikpapan was elected as the most comfortable and livable city in Indonesia with a value above the national average (Nawangwulan & Sutriadi, 2015) in the results of the Indonesian most Livable City Index survey conducted by the Association of Indonesian Planner (*Ikatan Ahli Perencana Indonesia*, Association of Indonesian planning expert) (2014).

A livable city has a comfortable environment and is a place to live and engage in physical and non-physical activities (Lyzia et al., 2017). Several indicators have been studied to achieve the quality of a livable city, such as the availability of basic needs, public facilities, open space for social interaction, environmental security, sanitation, and socio-economic support (Nawangwulan & Sutriadi, 2015). The level of comfort and quality of life of its citizens are observed through the

livability index (Masterplan Smart City Balikpapan, 2019). Balikpapan can maintain a livability index with an achievement target above the standard of 74.5% (see Table 5).

Table 5

Balikpapan Livability Index 2014-2020

Year	Livability index	Standard
2014	71.12	
2015	N/a	
2016	N/a	74,5%
2017	80.81	
2018	81.30	
2019	77.58	
2020	81.69	

Source: RPJMD of Balikpapan 2021-2026

In addition to being based on the livability index survey, Balikpapan also received the Indonesian Smart City Index (IKCI) award in 2015. The city was in the category of cities with a population of between 200 thousand and 1 million citizens. According to this classification, a city may be classified as a “smart city” if it can meet the needs of its citizens and solve problems related to economic, social, and environmental factors (Ilham, 2019). Additionally, the development of the livable city concept in Balikpapan received international recognition through the ICLEI World Congress in Seoul, South Korea, as a sustainable city and a livable city in 2015 (Nawangwulan & Sutriadi, 2015).

Policy Direction and Smart City Strategic Plan

The Balikpapan City Government stipulated various regional policies and regulations based on the 2005–2025 Regional Long-Term Development Plan (*Rencana Pembangunan Jangka Panjang Daerah*; RPJPD, Long-Term Regional Development Plan) and the 2016–2021 Regional Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Daerah*-RPJMD, Long-Term Regional Development Plan). The plan was continued in the 2021–2026 RPJMD. These various policies were set as the basis for developing sustainable regional development strategies and programs, including as a direction for smart city development.

The focus of smart city development in the long term is directed at developing the region in various fields by emphasizing the competitiveness of the regional economy, which is supported by multiple regional advantages and independence. Regional development based on smart cities not only promotes bureaucratic efficiency by prioritizing Information and Communication

Technology (ICT). Still, it is also directed at encouraging community participation and empowerment by making ICT infrastructure and facilities a supporting factor.

The local government designed a development strategy by building a modern interaction mechanism among the government, community, and all stakeholders to achieve the smart city vision when the smart city movement began to be implemented. This was to make Balikpapan a comfortable and livable city (the most livable city). However, there has been a gap between the potential, readiness, and real conditions of Balikpapan until now. This is a challenge in achieving the pillars of the smart city set by the government (Strategic Analysis of the Smart City of Balikpapan City, 2020).

SWOT Analysis as a smart city appears in appendix 1. The analysis emphasizes on five factors: (1) Smart governance, (2) Smart economy, (3) Smart environment, (4) Smart living, and (5) Society, where strengths, weaknesses, opportunities and threat are identified.

The smart city movement in Balikpapan began with the implementation of technical guidance, which was conducted in four stages. One of the activity materials was to formulate a smart city master plan as a robust legal umbrella in smart city planning and development strategies. However, the Balikpapan City Government has not ratified the smart city master plan document, and the document was still in the evaluation and revision stages when the research took place (The start of Balikpapan smart city program). (2019).

In planning the development of a smart city, the local government sets several smart pillars, including governance, economy, environment, branding, living, and society. However, it was agreed to replace the two pillars, branding and living, with mobility and people during the evaluation and revision of the smart city master plan (Strategic Analysis of the Smart City of Balikpapan City, 2020).

The smart people pillar was focused on developing human resources by optimizing the potential for the quality of public education and supporting various creative and innovative communities. Meanwhile, the smart mobility pillar was focused on optimizing the condition of the road infrastructure of the city and the strategic location of Balikpapan to achieve the target of a city that excels in industry, trade, services, tourism, education, and culture (The start of Balikpapan smart city program). (2019).

Collaborative Governance in Smart City-Based Regional Development

Collaborative Actor Role

The initial stage of the smart city development plan was conducted by producing smart city technical guidance in 2019 (The start of Balikpapan smart city program). (2019). The implementation of the technical guidance was conducted in four stages by involving various parties, such as the OPD in government, private, academic, community, and media agencies.

Discussions with various stakeholders through technical guidance resulted in a shared commitment to support the achievement of a sustainable city through the smart city program. This commitment was conducted by forming a council and a smart city implementation team consisting of local government agencies, private companies, organizations, communities, academics, media, and community leaders in the environmental field.

The involvement of various stakeholders was the basis for achieving a comprehensive understanding. This was done to reduce the gap between smart city development initiatives and the expectations of stakeholders for the success of the program (Strategic Analysis of the Smart City of Balikpapan City, 2020). An interdependent relationship between various collaborating actors was needed to conduct a joint commitment to the program. The government must be the leading sector as an example, role model, and motivator for the community in building a smart city. Internal collaboration occurs within a solid and integrated relationship between departments in public organizations. Meanwhile, external collaboration involves government and non-government parties, such as companies, non-profit organizations, and civil society. Information and ICT plays a significant role in facilitating collaboration between organizations, both internally and externally, in this context (The start of Balikpapan smart city program, 2019).

Smart City Collaboration Process

The successful process of smart city collaboration is influenced by the collaboration cycle, which starts from communication to building mutual trust and commitment, sharing resources, and mutual understanding to achieve the targeted results. The collaboration process is a dynamic cycle and will continue to rotate as long as a collaborative relationship is established (Islamy, 2018).

Collaboration between the government and various stakeholders existed for several years before Balikpapan was chosen to participate in the movement toward a smart city. This type of partnership has several characteristics: it is collaborative, has a high intensity, and is a long-term cooperation.

The parties have an equal and autonomous position and share risks, benefits, and resources (Islamy, 2018).

Results of analysis in the Institutional Design in Smart City Development appear in table 6.

Table 6
Institutional Design in Smart City Development

No	Agency/organization	Role	Actions
1	Government	-leading sector in smart city development -overseeing the planning, developing, and implementing smart city development -responsible for implementing smart city development -monitoring and evaluation -providing infrastructure and governance	-strengthening the main tasks and functions of each government agency in developing smart cities. -strengthening internal literacy within government agencies in developing smart cities.
2	Private	-participate in the planning, development and implementation of smart cities	- implement cooperation agreements smart city programs - provide technical support in the field various experts - the implementation of the smart city program can support the corporate social responsibility program
3	Colleges in the city of Balikpapan	-participate in the planning, development and implementation of smart cities	-strengthening the function and role of universities as part of the smart city council. -provide support in the development of various applications to support the development of smart cities. -human resource support through the involvement of students in internship programs in government agencies to support the development of smart cities.
4	The media	-participate in the planning, development, and implementation of smart cities	-implementing cooperation agreements between the government and the media regarding the publication -conduct information, education, and control functions on the smart city development -encouraging citizen participation to achieve the vision and mission
5	Society	-participate in the planning, development and implementation of smart cities	-increasing the active role and existence of creative communities - periodic updating of community database. -strengthening community literacy to the vision

Source: Research Data Reduction Results

Balikpapan has excellent potential to develop into a sustainable smart city. This was indicated by the results of the livability index from 2014–2020, which is always at an outstanding percentage to see the level of perception of comfort and quality of life of its citizens. Meanwhile, Balikpapan was also categorized as a smart city in the 2015 index because it could solve urban problems in the economic, social, and environmental fields. Based on the results of the consensus made jointly between the collaborating actors, it was agreed that each party would move according to its role in achieving the vision and mission of the smart city.

In developing countries, smart city initiatives mostly start with governmental initiatives (Tan & Taeihagh, 2020). Therefore, the government must be able to encourage solid collaboration and participation between sectors and build human resources within the government environment. Such human resources are experts in the field of information and communication technology. This follows the research proposed by Kencono (2021), in which the government element significantly influences internal collaboration within the scope of smart governance.

Tan & Taeihagh (2020) and Kencono (2021) stated that one of the objectives of governments in developing countries to prioritize smart city development is to spread inclusive governance. The participation of all stakeholders in the program development is encouraged with such an initiative, which is conducted through sharing information to achieve proper decision making. Joint decisions optimally consider joint actions to create a collaborative spirit to build trust and confidence among community members.

The government of the city of Balikpapan needs to continue evaluating the process of collaboration and participation, both within the government itself and all other stakeholders, to build a smart city-based area. It was found in the results of this research that there are still many weaknesses in encouraging collaboration and participation to achieve sustainable smart city-based regional development goals.

Palacios et al. (2020) stated that a multi-stakeholder network requires participation that cannot be made quickly. Additionally, investment is needed to support the success of smart and sustainable regional development. This multi-sectoral decision-making process is focused on several factors, one of which is effective multi-way communication.

In developing the smart city of Balikpapan, the local government acknowledges the lack of publicity and public literacy regarding smart cities. The government relies only on the role of mass media and online media in disseminating information about smart cities. Smart city

communication is critical to building awareness and encouraging the participation of all parties in supporting the progress of smart city-based regional development. See appendix 2 to see the analysis of Participation of smart city development.

The analysis shows that the smart city pillars consist of six sectors, (1) Smart governance, (2) Smart branding, (3) Smart economy, (4) Smart living, (5) Smart society, and (6) Smart environment. Each pillar is examined their problems in terms of development focus, progress development and their weaknesses.

This study finds that collaborative to develop smart city educated society in developing the city. In this study development planning that involves social empowerment contributes success in the regional development achievement. The key success on the public communication has aspired how to educate people in the public spaces so that collaboration between government and social parties are well applied.

Conclusion

To conclude, as the leading sector in regional development, the government must become a driving force to create harmonious multi-stakeholder collaboration and encourage the participation of all parties in developing a comfortable and livable Balikpapan smart city. Therefore, empowering human resources experts in ICT is a vital prerequisite for achieving a smart and sustainable city. This study indicates a novel contribution that social empowerment is the key point in the collaboration between government and society to develop regional planning development. However, this study has limitation in that the informants involved are limited and the use of primary data is not provided. Future research is suggested to involve more informants including government and social parties to improve the drawback.

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Appendix 1

SWOT Analysis Based on the Smart City Pillar Balikpapan City

Smart city pillars	Strength	Weakness	Opportunity	Threat
Smart governance	<ol style="list-style-type: none"> 1. infrastructure is available 2. there is government support 3. There are many applications 4. Policy already exists 5. The e-governance blueprint already exists 	<ol style="list-style-type: none"> 1. Many applications from the center are complex and difficult to integrate. 2. Applications within the city government have not been integrated 3. Infrastructure development is still partial 4. Data center is not centralized 5. Limited hr 	<ol style="list-style-type: none"> 1. Internal integration within the city government. 2. Integration across other agencies. 3. Cooperation with stakeholders in system development for service improvement. 4. Acceleration of development with it. 5. Improved work culture 6. Hdi rises 7. People are more it-literate 	<ol style="list-style-type: none"> 1. How to build cooperation with universities. 2. The potential for pad increases, but apbd revenues decrease. 3. Enforce employee discipline. 4. Synergy between city government agencies. 5. Increased competence through it training.
Smart economy	<ol style="list-style-type: none"> 1. Existence of airport infrastructure and international standard passenger and container ports, 2. Strategic location as the gateway to east Kalimantan and is on the alki it route, 3. Availability of modern trade facilities and star hotels 4. Office center for foreign companies, regional soes, and vertical agencies 5. Having a technology-based state university for the east region 6. Center for financial/banking service activities in east Kalimantan 7. Security is guaranteed with the east Kalimantan police and the Mulawarman Kodam located in Balikpapan. 8. The location is relatively protected from disasters 	<ol style="list-style-type: none"> 1. The cost of distribution of goods and living costs are expensive 2. The mse costs are relatively higher than other regions 3. Goods supply 90% comes from outside Balikpapan or east Kalimantan 4. Limited market due to the small population of Balikpapan and east Kalimantan 5. The competitiveness of smes is still relatively low. 6. Few fintech-based ventures 7. Lack of consultant services in Balikpapan 8. Limited space for regional development 	<ol style="list-style-type: none"> 1. There are three national strategic projects in Balikpapan 2. East Kalimantan as IKN 3. Positioning Balikpapan as a mice city 4. Surrounded by hinterland areas rich in natural resources. 5. Fintech development by utilizing the creative economy community 6. Development of data centers in industrial areas 7. Business center electronics 8. Improving the quality of msme hr 	<ol style="list-style-type: none"> 1. The economy of east Kalimantan is still based on natural resources, which are at risk of commodity price fluctuations. 2. The volatility of commodity prices causes the inflation of goods to be quite high 3. The functioning of the airport in Samarinda city as an airport serving national scale flights 4. The number of problems in the legality of land and

	(earthquakes and volcanoes) 9. The number of productive generations is quite high, and the composition of the population is heterogeneous 10. Have a national non-cash movement team	9. Less competitive land prices	9. Distribution network expansion 10. Market share expansion	
Smart environment	1. Sanitary landfill 2. Non-mining 3. Perwal no. 8/2018 on reducing the use of plastic bags Hospitals, schools, hotels, and offices, some already have waste banks	1. Waste transportation is not maximized 2. High operating costs 3. Trash has not been selected	1. Garbage bank 2. Methane gas from waste processing 3. Communal wwtp processing into fertilizer 4. Tpa ≠ study tour Recycle ≠ crafts	1. Trigger flooding 2. Spread of disease 3. Under-ground water pollution 4. Landslide
Smart living	1. It is a clean, conducive city, a heterogeneous society, and free from coal mines. 2. Strategic location (as the gateway to east Kalimantan-Kaltara, crossed by the alki ii route, relatively free from earthquakes) 3. Availability of international standard ports (land, air, and sea). 4. Availability of complete industrial, educational, health, and tourism service facilities. 5. Regional leaders and all stakeholders have a strong will to implement change. 6. Have regulations related to e-government (sk and perwali) and applications in realizing good governance. 7. Have an adequate structure, infrastructure, and superstructure. 8. Enjoy the demographic bonus (2015: 71% of	1. It does not have a data and command center yet 2. it does not have a smart city masterplan yet 3. Some areas are prone to flooding and landslides and are prone to fires. 4. Low odf 5. High cost of living 6. Limited raw water capacity 7. Medium hr capacity 8. Small road capacity 9. Most of the basic needs, food, and animal needs are supplied from outside Balikpapan	1. At the national level: as a super-city, a city that is comfortable to live in, a city for the administration of nugraha, a creative city, a city of ease of starting a business, a city of mice and pkn. 2. Community demands better public services. 3. The increase in pad is not based on natural resources.	1. Environmental degradation 2. Increasing narcotics circulation 3. Cultural decline due to the influence of the internet

Smart branding	<p>productive age and 25% of young people</p> <p>9. Has a Balikpapan creative forum institution.</p> <ol style="list-style-type: none"> 1. Mice city 2. Transportation facilities/gateway 3. Completeness of hospitality facilities (amenities) 4. Political will in sustainable city management 5. Quality of human resources 	<ol style="list-style-type: none"> 1. There is no strong story telling about the history of the city. 2. Branding concept is changing (dynamic) 3. There is no agreement on the value/content that you want to highlight 4. The creative city ecosystem has not been formed systematically 	<ol style="list-style-type: none"> 1. There is no consistently scheduled annual event 2. Development of the digital age. 3. The number of immigrants with good quality human resources. 4. Security factor and minimal conflict 5. Coastal potential that has not been worked out properly 	<ol style="list-style-type: none"> 1. The economy depends on the surrounding area (sustainable economy) 2. Flood disaster and shortage of raw water sources 3. High cost of living
Smart society	<ol style="list-style-type: none"> 1. There is an awareness of the importance of education in the city of Balikpapan. 2. Conducive social community 	<ol style="list-style-type: none"> 1. The number of schools is not sufficient for the SMP and SMA zoning system. 2. Inadequate human resources in terms of quality and quantity (teachers). 3. Low level of ability to access technology (gaptek). 4. Unemployment and poverty rates are still high (9.52%). 	<ol style="list-style-type: none"> 1. Stable population growth rate. 2. The level of information needs quickly and easily. 3. Equitable distribution of infrastructure and human resources in each school. 4. Increasing digital literacy and e-learning education. 5. Need training and capacity building (labor competence). 	<ol style="list-style-type: none"> 1. Lack of interest in reading books 2. Pluralism (communal friction) 3. Social impact caused by poverty and unemployment can increase crime, which is quite high.

Source: Balikpapan City Smart City Strategic Analysis, 2020

Appendix 2.

Participation of smart city development

Smart city pillars	Development focus	Progress	Weakness
Smart governance	Improving the quality of public services and fostering government and community participation to optimize the public service system	<ul style="list-style-type: none"> - the government makes various supporting applications to facilitate public services - improved ict infrastructure by increasing the internet network by 100 mb 	<ul style="list-style-type: none"> - many applications are made that are not updated, and many complaints from users (community).
Smart branding	Focusing on developing business branding, city appearance branding, and tourism branding	<ul style="list-style-type: none"> - launch of city branding logo based on perwal no. 11 year 2020 - improving the structure of city roads and transportation - cooperating with the association of the indonesian tour and travel agencies (asita) and bankaltimtara in providing tourism buses for the benefit of city tours - mobile love balikpapan application development 	<ul style="list-style-type: none"> - tourism bus stop operating during the covid-19 pandemic - the cinta balikpapan mobile application has not been updated since it was first released, and only 50 downloaders for the application.
Smart economy	Increasing the competitiveness of the environment-based regional economy (green economy)	<ul style="list-style-type: none"> - establishing a public service mall to facilitate one-stop licensing - development of small barnacle industrial centers in 2018. The government built 20 production houses for ikm players processing agricultural and forest products. - establishing a business incubator by updating ikm, sme, cooperative data, and various entrepreneurship training - cooperating with pt. Telkom in website development and e-commerce system 	<ul style="list-style-type: none"> - implementation of the licensing system is still too complicated and must use online, offline systems, and not only done in one location. - the barnacle industry centers are less attractive to smes and are reluctant to occupy them. - the business incubator program is still running - website and e-commerce development is targeted for completion in 2023.
Smart living	Focus on improving the quality of community life, comfort in activities, transportation, integrated and efficient facilities, and infrastructure.	<ul style="list-style-type: none"> - provision of free internet through the cooperation of the local government with pt. Telkom and telkomsel - provision of road-based public transportation services and public buses that connect between cities - provision of public transportation for the disabled 	<ul style="list-style-type: none"> - the development of corridors for public transportation facilities has not been optimal. - the management of traffic engineering and the development of the city road network has not been optimal. - parking facilities and infrastructure are still lacking

Smart society	Focus on creating public order and harmony, environmental awareness, easy access to education data, increasing community digital literacy, and easy access to public services	<ul style="list-style-type: none"> - development of smart pju (penerangan jalanan umum) (public street lighting) - the government develops an education information management system integrated with dapodik data. - updating data for persons with social welfare problems (pmks) that can be integrated with the integrated referral service system (slrt) - local governments develop various applications, such as sit respons, lapor warga, and lapor pak! (layanan pengaduan dan pelaporan) Balikpapan 	<ul style="list-style-type: none"> - school system still low in updating the dapodik system. - there is no regulation to regulate the institutions and functions of slrt - applications are not updated and tend to be complicated. Thereby, the enthusiasm of people to use the application is reduced.
Smart environment	Focus on developing good, responsible, and sustainable environmental governance	<ul style="list-style-type: none"> - the Balikpapan city government received an award in the smart environment category from the ministry of communication and information. - the successful results of quick-win smart city in utilizing methane gas at tpa manggar in collaboration with pt. Pertamina hulu mahakam. - tpa manggar is one of the best performing landfills in Indonesia, equipped with 3r (reduce, reuse, recycle) supporting facilities - cooperation with abadan Balikpapan (guided partner of pt. Pertamina tbk) in the field of social enterprise for waste management. - cooperation with the garbage community for public education in waste management - create a waste tracking application by the environmental service with the garbage community (go garbage application) 	<ul style="list-style-type: none"> - utilization of methane gas is used as a substitute for lpg and distributed to the community around the tpa (currently, 20–50 families have enjoyed it) - the waste tracking application is still not optimal, and therefore, it still needs to be evaluated and redeveloped with a better system.

Source: Research Data Reduction Results.