CHAPTER I
INTRODUCTION

1.1 Background

Resilience becomes popular since Holling publishes his article "Resilience and Stability of Ecological Systems" in 1973. In that article, there are two different meanings of resilience, i.e., engineering and ecological resilience. Since then, many discipline studies from natural science to social science have developed and influenced the term resilience. Every discipline study has its interpretations of resilience. However, it still rooted in the equilibristic view of resilience with an emphasis on bounce-back ability (Folke, 2006; Simmie and Martin, 2010; Davoudi, 2012; White and O'Hare, 2014). This ability is essential as a response to external shocks, which could be a natural disaster (i.e., flooding, earthquake, and hurricane) or a social upheaval (i.e., monetary crises, wars or revolutions). Moreover, resilience also emphasizes on "non-linear dynamics, thresholds, uncertainty, and surprise, how periods of gradual change interplay with periods of rapid change and how such dynamics interact across temporal and spatial scales" (Folke, 2006). Those situations are familiar in the cities, which explaining why many governments and decision-makers used the term resilience in their policies and strategies (Porter and Davoudi, 2012; Shaw, 2012; White and O'Hare, 2014).

Many governments and decision-makers only view resilience in the perspective of engineering resilience at worst or ecological resilience at best (Davoudi, 2012; Fünfgeld and McEnvoy, 2012; White and O'Hare, 2014). Thus, most of them used resilience in the context of disaster management policies and strategies. However, resilience encompasses more issues and more comprehensive. In the urban context, city resilience is "a complex, multidisciplinary phenomenon, focusing on a single or small number of contributing factors ultimately results in partial or inaccurate conclusions and misrepresentation of the multiple causes of the phenomenon" (Jabareen, 2013). The stakeholders and decision-makers should have the same perspective to define the term resilience. Especially in the context of "resilience for whom and against

what?" (Leach, 2008; Wilkinson, 2012; Vale, 2014; White and O'Hare, 2014). It is imperative to implement the idea of resilience to the complex social ecology of a city, so resilience can be used as "a useful concept" and "as progressive practice," especially for improving the life prospects of disadvantaged groups (Vale, 2014). However, the literature's gap in resilience makes another challenge when measuring resilience and assessing a system's resilience in a city (Wilkinson, 2012; Jabareen, 2013).

Many kinds of the literature of resilience assessment, in the context of urban resilience, mostly focus on the three Es approach (Environment, Economy, and Equity) and suggest quantitative indicators (Jabareen, 2013; Romero-Lankao *et al.*, 2016). It also overlooks cities and ordinary communities (Jabareen, 2013), especially the disadvantaged groups, which often forgotten in the dimension of resilience rooted in engineering and ecology (Vale, 2014). As explained in Romero-Lankao *et al.* (2016), the theoretical approach determines the choice of indicators of resilience assessment, which tends to shed light on some dimensions and omit others. On the other hand, the practitioners often construct the indicators by what they can (i.e., data availability) or what they want (i.e., values and interpretations) instead of what they should measure. Therefore, they leave out some key processes and interactions involved (Romero-Lankao *et al.*, 2016).

Several efforts have been made for measuring resilience and assessing a system's resilience in a city. For instance, the Resilience Alliance had developed a methodology and framework that emphasizes the dynamics of resilience in social-ecological systems. This framework gives more understanding about the system itself, and what is strengthening or weakening system resilience, hence decision-makers can develop strategies for managing both known and uncertainty change (Resilience Alliance, 2010). Wilkinson (2012) illustrates that practitioners address and linkage their problems (i.e., social planning, food security, young people, energy, public health, land use, transport, and environment) in different ways than the planners usually do. Moreover, this method also helps them to more quickly and pointedly these deeper issues, which have more engagements in sustainability (Wilkinson, 2012).

Other organizations use a different approach by assessing resilience at the community level to improve preparedness. Organizations such as Cities Alliance and World Resources Institute (WRI) make a partnership to work on Urban Community Resilience Assessments (UCRA) in three cities: Rio de Janeiro, Brazil; Surat, India; and Semarang, Indonesia. WRI has developed UCRA with input from community and city leaders. The UCRA is a tool to help cities include citizen and community capacities into broader assessments of urban resilience. This tool consists of the measurement of vulnerabilities, resilience capacities, access to services, information, social networks, and financial resources across neighborhoods (Rangwala *et al.*, 2018). UCRA focuses on assessing social cohesion, familiarity with local risks, early warning systems, and disaster readiness. It presents an overview of preparedness behaviors, risk perception, and strength of community relations. Therefore, it helps cities determine what kind of public policies and concrete actions that suitable based on the specific traits of each community, including geography, history, culture, and habits (*RELEASE: New Partnership to Address Resilience Data Gaps in Asian and Latin American Cities*, 2017).

Another attempt for measuring resilience at the city scale is developed by ARUP and supported by The Rockefeller Foundation, who has been pioneering work on climate resilience in both rural and urban regions for more than a decade. The Foundation developed the 100 Resilient Cities program (100RC), focusing on urban resilience in 2013. 100RC purpose is to help cities around the world become more resilient to the physical, social, and economic challenges that increasingly affect the 21st century. Furthermore, 100RC defines two kinds of challenges in the cities. First are chronic stresses, which described as slow-moving disasters that weaken the fabric of a city (such as high unemployment, inefficient public transport, food security). Second is acute shocks that suddenly happen or sharp event which threatens a city (such as earthquakes, floods, terrorist attacks) (The Rockefeller Foundation and ARUP, 2015a). It leads the Rockefeller Foundation partnered with the global design firm ARUP to do extensive research and evaluation of cities' experiences around the world. The result is the City Resilience Framework (CRF), consisting of a common set of factors and systems

that enhance a city's ability to survive in the face of these challenges (The Rockefeller Foundation and ARUP, 2015a).

Moreover, this CRF also leads to developing an index to measure and monitor the multiple factors (i.e., strengths and weaknesses) that contribute to their resilience. This index, called the City Resilience Index (CRI), depends on the city's physical assets as well as the city's policies, social capital, and institutions. CRF consists of four dimensions, 12 goals and 52 indicators, which also form the foundations of CRI (The Rockefeller Foundation and ARUP, 2015b). CRI provides a common basis of measurement and assessment to better facilitate dialogue and knowledge-sharing between cities (The Rockefeller Foundation and ARUP, 2015b), especially for those who are joining 100RC.

Semarang City is the first city in Indonesia that joining the 100RC program established by The Rockefeller Foundation. The involvement of Semarang City in this program has been through a long journey. It started since Semarang City became a part of the *Asian Cities Climate Change Resilience Network* (ACCCRN) program, founded by the Rockefeller Foundation, in 2009. This action is the first attempt of the local authority, such as Semarang, to integrate climate change adaptation into city planning. The city's government has worked to develop an Urban Climate Resilience Strategy (UCRS), a prioritized action reducing vulnerability to climate change (ISET, 2010; Sutarto and Jarvie, 2012).

Developing UCRS has involving many actors such as government officials, local NGOs, and academics and coordinated by a city working group (CWG), which leading ACCCRN involvement. Furthermore, the Local Development Planning Board (BAPPEDA) manages CWG management and responsibilities in planning, and use of public development funds. The CWG structure allows integration of ACCCRN activities into city planning processes and budget cycles (ISET, 2010; Sutarto and Jarvie, 2012). This achievement in Semarang City led recognition in local and national government and appointed Semarang City as a national pilot Resilient City by Indonesia's Ministry of Environment (Sutarto and Jarvie, 2012). This achievement and readiness lead Semarang City to be selected in100RC, another program that is also established by The Rockefeller Foundation.

Semarang City was joining 100RC since December of 2014. However, it took almost one year and a half for Semarang City to develop City Resilience Strategy (CRS), which had been launched in May of 2016. The strategy development process in Semarang had been through several steps and led by Chief Resilience Officers (CRO), a team chosen to safeguard the 100RC. In Semarang City, this team has personnel from different backgrounds consisting of the municipal government, academics, and members of the community. They also established The Resilient Steering Committee, which has members from various elements of the community. This committee provides guidelines and inputs for the implementation of 100RC. The high commitment of the CRO, the committee, the governments, academics, and members of the community had resulted in 18 city resilience strategies and 53 city resilience initiatives, which were under six pillars of strategy (Semarang Municipality, 2016).

Although Semarang City has developed CRS, it does not describe how resilient this city. Thus, measuring resilience is very important since it provides resilience data in this city and as feedback for local leaders and policy-makers to develop public policies, strategies, and concrete actions. As a participant of 100RC, Semarang City also selected to participate in CRI that developed by ARUP. This participation provides resilience data at the city scale. This project had already done in 2017. At the beginning of 2018, UCRA that developed by WRI also attempts to measure community-level resilience in Semarang. Both CRI and UCRA are filling resilience data gaps in Semarang City and also complementing each other.

CRI focuses on the city's physical assets as well as the city's policies, social capital, and institutions Index (The Rockefeller Foundation and ARUP, 2015b). On the other hand, UCRA emphasizes on community-level vulnerability and their resilience to climate change. Thus, move it into investment-ready status, building social cohesion and individual capacities as a complement to climate-resilient physical infrastructure planning (*RELEASE: New Partnership to Address Resilience Data Gaps in Asian and Latin American Cities*, 2017). However, some indicators in CRI and UCRA are overlapping due to it refers to "the same thing" in essence. For example, CRI uses "safe and affordable housing" as an indicator,

while UCRA applies "urban poor housing (informal housing)" as an indicator. Those two indicators refer to the same thing, although CRI's indicator has broader meaning. Hence, it needs developed resilience indicators that are comprehensive and suitable for measuring resilience to mainstreaming resilience into development planning policies in Semarang City.

Two types of development planning policies in Indonesia are development planning policies (non-spatial) and land use planning policies (spatial). The integration and coordination between these two types of policies are essentials as they accompany one another (Handayani *et al.*, 2019). Law No. 25, 2004, provides details about the strategic development planning policy in Indonesia. Based on this law, three types of the strategic development planning policies: long-term (20-years plan), mid-term (5-years plan), and short-term (1-year plan). Regional Long-Term Development Planning or *Rencana Pembangunan Jangka Panjang Daerah* (*RPJPD*) includes vision, mission, and regional development guidelines in the National RPJP. Because of this long-term planning, RPJPD can hardly follow up the dynamic changing of the city. However, RPJPD consists of general guidelines in compiling the mid-term planning.

In contrast, Law No. 26, 2007, provides details about the spatial planning system in Indonesia. According to this law, three types of the spatial planning: National level, Provincial level, and District / Municipality level. District / Municipality spatial plan are divided into two categories: regional spatial plan and detailed spatial plan. The spatial planning focuses on city's land use and spatial. Thus, all of the city's aspects are seen in the context of spatial policies. However resilience thinking includes all of the city's aspects and systems to accommodate city's uncertainties, adversities and changes. Based on this consideration, this study does not use RPJPD and the spatial plans for content analysis of resilience indicators.

In this study, development planning policies in Semarang City refer to Regional Medium-Term Development Planning or *Rencana Pembangunan Jangka Menengah Daerah (RPJMD)*. This RPJMD is the five years plan document of the development planning policy. According to the Law No. 25, 2004, RPJMD is an elaboration of the Head of Region's visions, missions, and

programs. It also consists of the direction of regional financial policies, local development strategies, general policies, and the programs of Regional Apparatus Work Unit (OPD), and territorial programs accompanied by work plans within the indicative framework and funding framework that are indicative.

Moreover, RPJMD also consists of indicators that describe the government's performance. In the urban resilience context, the government, as an institution, should survive and adapt when facing whatever challenges and adversities in the city. Therefore, indicators in RPJMD also reflect the level of resilience in the city. As a strategic development policy, RPJMD represents how the local government implements resilience thinking into their strategies and policies. Thus, content analysis of the documents of RPJMD can investigate which resilience indicators already used in the document. Furthermore, this analysis also can use to develop resilience indicators that are comprehensive and suitable for measuring resilience in the city.

1.2 Problem Statement

As a participant of 100RC, Semarang City faces many challenges and issues in physical, social, economic, and health. Semarang City also has experienced a major shock such as flash flooding and suffering chronic stress such as urban sprawl, sea-level rise, land subsidence, tidal flooding, water scarcity, dengue hemorrhagic fever (DHF), high unemployment rate (The Rockefeller Foundation and ARUP, 2015a; Semarang Municipality, 2016). However, Semarang City gives the evidence of their commitment to adapting and improving this city to become more resilient since this city was joining the ACCCRN program in 2009 and developing UCRS to adapt to climate change (ISET, 2010; Sutarto and Jarvie, 2012; Semarang Municipality, 2016). This high commitment is essential when implementing the 100RC program since it needs an inclusive process and involves many elements of the city. Further, local leaders in Semarang City, in this case, are CRO and local partners, should acts as "resilience champions and experts and rising support among stakeholders and residents" in order to make sure the success of developing CRS (*Our Impact*, no date).

In Semarang City, CRS is developed based on CRF that describes the qualities of resilient systems consisting of reflective, robust, redundant, flexible, resourceful, inclusive, and integrated. All those qualities are under four dimensions: 1) Health and Wellbeing; 2) Social and Economic Development; 3) Environment and Infrastructure; 4) Leadership and Strategy (The Rockefeller Foundation and ARUP, 2015a). Moreover, this strategy also responds to the current issues and challenges in Semarang City. Building capacity plays an essential role in improving the empowerment and the productivity of the government, communities, and institutions, as well as many initiatives of CRS (Semarang Municipality, 2016).

CRS consists of 6 pillars of strategy, which are divided into 18 city resilience strategies and 53 city resilience initiatives. These pillars of the strategy are: 1) Sustainable Water and Energy; 2) New Economic Opportunities; 3) Readiness for Disasters and Diseases; 4) Integrated Mobility; 5) Transparent Public Information and Governance and; 6) Competitive Human Resources (Semarang Municipality, 2016). All of these initiatives should be implemented in order to achieve a resilient city in Semarang City. Moreover, this action involves different actors that highlighted the need to clear communication in terms that decision-makers can use (Leach, 2008). Therefore, CRS should integrate with development planning policies in the city. Thus, it needs a tool to measure resilience on the city scale, which working as feedback for the government when implementing CRS. One of these tools is CRI.

CRI is a tool measuring resilience, which complementing CRF to build a resilient city. Since Semarang City uses CRF as a base framework when developing CRS, CRI is a compatible index to measure and monitor the multiple factors (i.e., strengths and weaknesses) that contribute to building resilience in Semarang City. Further, CRI provides a common basis of measurement and assessment to facilitate better dialogue and knowledge-sharing between cities (The Rockefeller Foundation and ARUP, 2015b). Therefore, it creates an opportunity for Semarang City to collaborate with various cities and institutions on the international scale, especially cities in the 100RC network.

Since CRI is developed for measuring resilience in various cities, it consists of mixture indicators that can be used for the prevailing situation and specific situation. Thus, there are some indicators in CRI that are not suitable for the local condition in a particular city such as Semarang City. It relates to the city's policies, social capital, institutions, and the city's physical assets. Romero-Lankao et al. (2016) point out that the practitioners often construct the indicators by what they can (i.e., data availability) or what they want (i.e., values and interpretations) instead of what they should measure. On the other hand, UCRA uses a different approach to assess resilience in Semarang City. Although UCRA focuses on resilience assessment at the community level, it also considers resilience assessment at the city scale. Hence, there is the possibility that some of CRI's indicators overlap with UCRA's indicators. Therefore, both of CRI's and UCRA's indicators should be reviewed and analyzed. Moreover, it provides resilience indicators that are compatible, applicable, and suitable for Semarang City conditions to mainstreaming resilience into development planning policies.

Another study of operationalizing resilience in two cities, Semarang and Tegal, reveals that these sites already contained the term resilience to address floodings. That study highlights the importance of integrative and comprehensive when operationalizing resilience in programs and budgets of development plans in Indonesian cities. Moreover, it also discovers that both short-term actionable initiatives and long-term transformative frameworks are needed when implementing resilience in development policy (Handayani *et al.*, 2019). Thus, it indicates that resilience and development planning policies have a close correlation.

A development planning policies, such as RPJMD, plays a vital role for the city development planning. RPJMD, as a five years plan and a non-spatial plan, contains the combination of the sectoral planning and comprehensive planning to budgeting process of the local government programs (Handayani *et al.*, 2019). RPJMD consists of the visions and missions of the Head of Region that is chosen every five years. RPJMD also includes indicators that should be achieved by the local government. These indicators describe the performance of the local government when dealing with shocks and stresses in the city. In contrast, RPJPD

also includes the combination of sectoral planning and comprehensive planning for 20-years plan, and should be used as reference in compiling RPJMD. However, because of this long-term type, RPJPD can hardly follow up the dynamic changing of the city that is crucial in resilience thinking. Meanwhile, the spatial planning is development planning policies that only focuses on city's land use and spatial plan. Based on all of these consideration, this study uses RPJMD for content analysis of resilience indicators.

Indicators in RPJMD reflect the level of good governance, which leads to enhance resilience in the city. Hence, indicators in RPJMD also can be considered as resilience indicators. All of this implies that RPJMD describes the local government already uses resilience thinking in its strategies, policies, and programs. However, city resilience encompasses many aspects and more complex. Thus, content analysis plays an essential role in investigating which resilience indicators are already mentioned in the documents of RPJMD. Moreover, this analysis also can use to develop resilience indicators that are compatible, applicable, and suitable for RPJMD

This study uses two documents of RPJMD that are The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD. Both two documents of RPJMD consist of vision, mission, guidelines of development planning, and programs for five years plan. Revision of The 2016-2021 Semarang RPJMD is the new version of The 2016-2021 Semarang RPJMD. It is because there are some changes in the rules and the Regional Apparatus Work Unit or *Organisasi Perangkat Daerah* (OPD) in the Semarang Municipality. Moreover, based on the evaluation of The 2016-2021 Semarang RPJMD, some contents in the documents are not compatible with the new rules of the National Government. Therefore, Revision of The 2016-2021 Semarang RPJMD contains the substantial changes of the contents in The 2016-2021 Semarang RPJMD. Thus, this study uses these two documents of RPJMD to investigate whether there are changes in context of resilience.

1.3 Purpose and Objectives

This research aims to identify between CRI and UCRA, which method having resilience indicators that are compatible, applicable, and suitable for RPJMD in Semarang City. Thus, objectives that would be achieved in this research consist of:

1. To analyze what resilience indicators based on CRI and UCRA are discussed within The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD.
2. To identify and analyze the clusters of CRI's and UCRA's resilience indicators within The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD to compare resilience indicators between CRI and UCRA.
3. To analyze how the government explores and discusses those resilience indicators in each chapter within The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD to determine the consistency of resilience indicators for better development planning policy.

1.4 Scope of Research

1.4.1 Scope of Substantial

The scope of substantial restricts the material discussion related to the assessing of the compatibility of resilience indicators based on CRI and UCRA with the conditions and development planning policies in Semarang City:

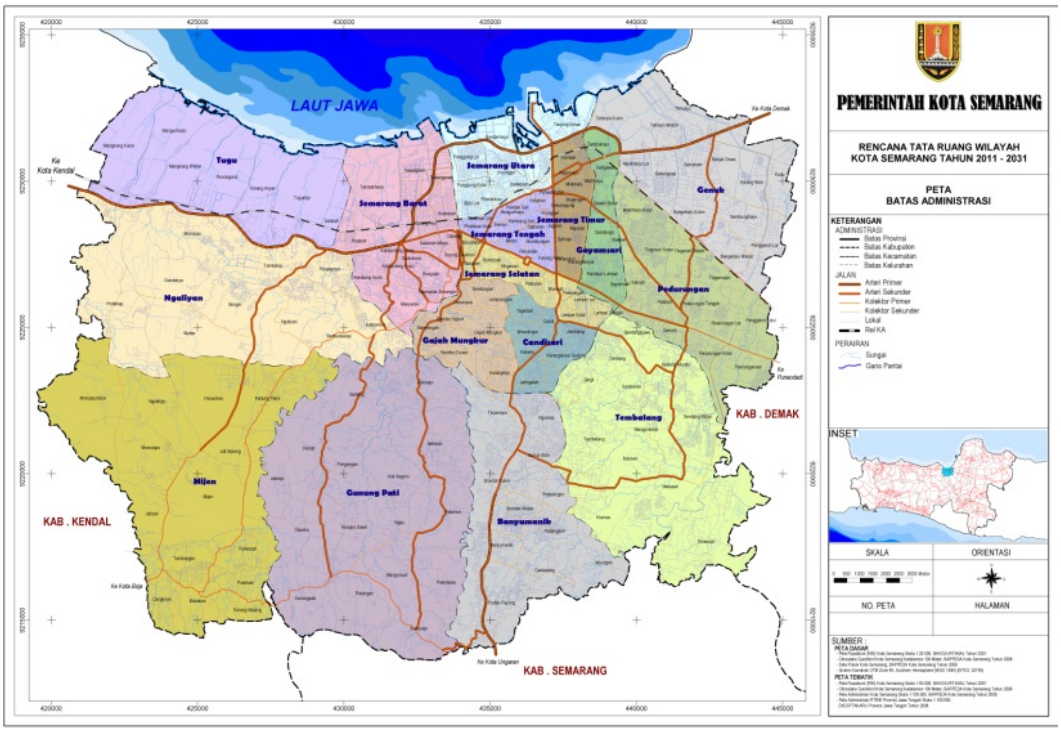
1. The assessment of the compatibility of CRI's and UCRA's indicators related to the better measurement of resilience. It also examines which resilience indicators suitable based on the data availability and development planning policies in Semarang City.
2. CRI, developed by ARUP based on CRF, provides a common basis of measurement and assessment to facilitate better dialogue and knowledge-sharing between cities (The Rockefeller Foundation and ARUP, 2015b). It consists of mixture indicators that can be used for the common situation and specific situation in various cities and related to the city's policies, social capital, institutions, and the city's physical assets.

3. UCRA, developed by WRI, is a tool to help cities include citizen and community capacities into broader assessments of urban resilience. It can use to measure vulnerabilities, resilience capacities, access to services, information, social networks, and financial resources across neighborhoods (Rangwala *et al.*, 2018). It focuses on assessing social cohesion, familiarity with local risks, early warning systems, and disaster readiness in the communities.
4. Urban resilience defined by 100RC as "the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience." Chronic stresses are "slow-moving disasters that weaken the fabric of a city," while acute shocks are "sudden, sharp events that threaten a city" *(What is Urban Resilience?*, no date).
5. Regarding resilience indicators, the combination of a theoretical approach and a practical approach is essential when constructing the indicators. While the theoretical approach determines the choice of indicators of resilience assessment, a practical approach considers data availability, values, and interpretations of practitioners (Romero-Lankao *et al.*, 2016).
6. Different approaches are used to develop resilience indicators such as engineering, ecological, and evolutionary resilience.
7. A place-based perspective is essentials in resilience thinking due to the different capabilities of places to respond to the changes in spatial planning (White & O'Hare, 2014; Mehmood, 2016).
8. Good governance is in line with the level of the city's resilience. It is related to the capacity and competence to engage in participatory planning and decision making (Jabareen, 2013). Furthermore, the governance structure and how the decision-makers frame the issues in the policy are keys to increasing resilience in the city (Adger et al., 2011).

1.4.2 Scope of Spatial

Location research takes place in Semarang City. One reason for choosing the location of this research is because Semarang City is the first city in Indonesia

that participated in the assessment of CRI developed by ARUP. Moreover, Semarang City has involved in resilience research for several years and designated as a national pilot Resilient City by Indonesia's Ministry of Environment (Sutarto and Jarvie, 2012). Semarang City also is the first city in Indonesia that developing city resilience strategy.



Source: Spatial Planning of Semarang City, 2011-2031(semarangkota.go.id)

FIGURE 1.1
ADMINISTRATION MAP OF SEMARANG CITY

1.5 Significance of Thesis

Performing the research of mainstreaming resilience into development planning policies in Semarang City can give some benefits for both practitioners and researchers as follows:

1. Contribution of thought and considerations of the Local Government of Semarang City and its stakeholders in developing city's resilience indicators that suitable for conditions in Semarang City based on CRI designed by ARUP and mainstreaming resilience into development planning policies in Semarang City.

2. A reference to the other research related to measuring resilience since the topic is exciting and receiving many contradictions up till now. It also contributes to filling the theoretical and practical gaps of city resilience literature, especially the possible way to incorporating the resilience approach into the city's policies.

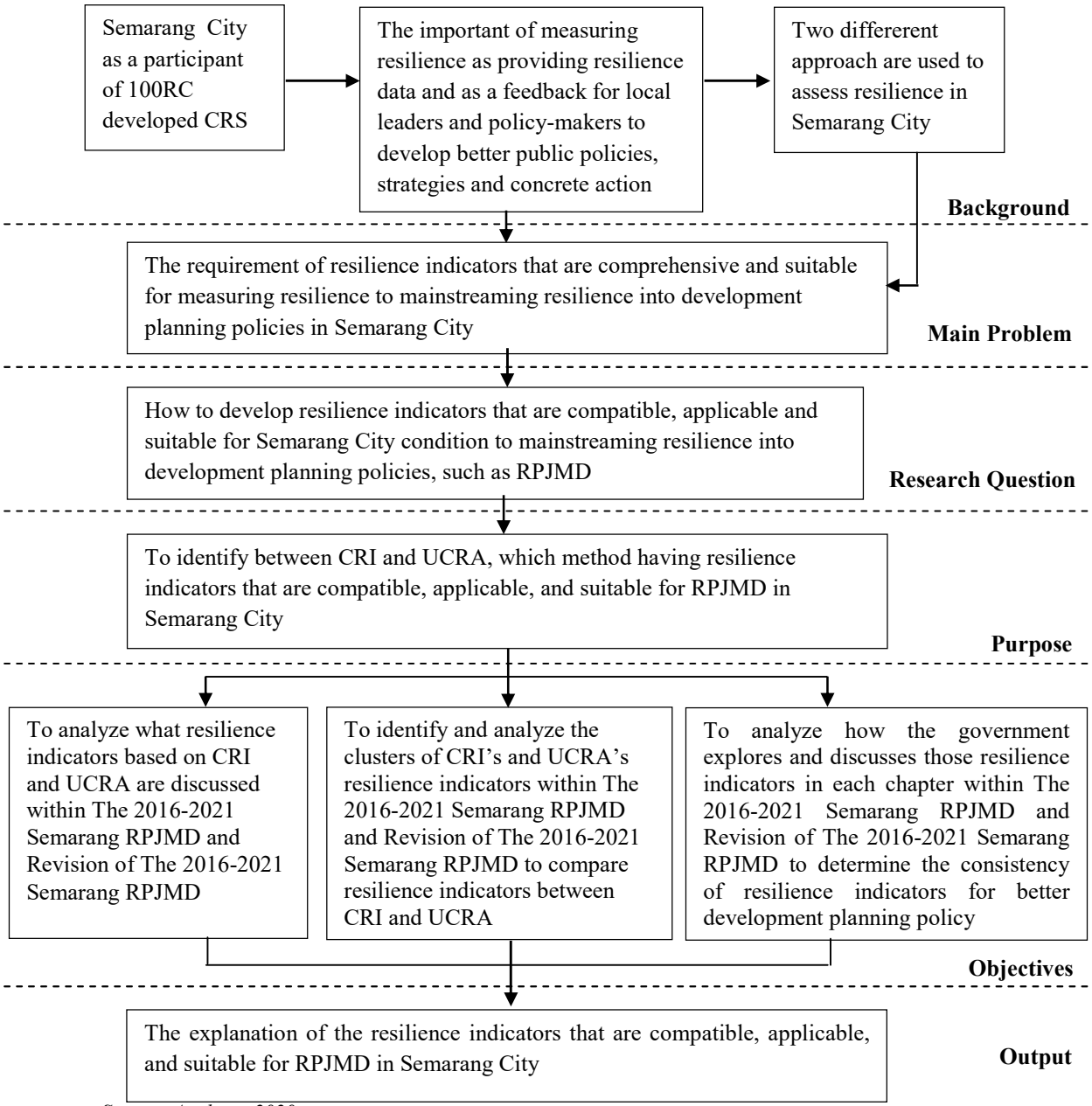
1.6 Research Framework

The conceptual framework of this research is based on the resilience assessment in Semarang City and the compatibility of these indicators with conditions in this city to mainstreaming resilience into development planning policies. Building resilience in Semarang City starts since this city joined ACCCRN in 2010. Then, Semarang City also developed strategies related to climate change and resilience, such as UCRS and CRS. Although Semarang City has developed CRS, it does not describe how resilient this city. Thus, measuring resilience is very important since it provides resilience data in this city and as feedback for local leaders and policy-makers to develop better public policies, strategies, and concrete actions.

Two organizations measure resilience assessment in Semarang City with different approaches. ARUP uses CRI to assess resilience at the city scale, while WRI uses UCRA to measure resilience at the community level. However, some indicators of UCRA also can be used to assess resilience at the city scale. Therefore, there is a high possibility that some indicators in CRI and UCRA are overlapping. Moreover, it highlights the requirement of resilience indicators that are comprehensive and suitable for measuring resilience to mainstreaming resilience into development planning policies, such as RPJMD, in Semarang City.

This research attempts to identify between CRI and UCRA, which method having resilience indicators that are compatible, applicable, and suitable for RPJMD in Semarang City. Therefore, two documents of RPJMD in Semarang City have to be reviewed and analyzed to describe what themes/issues related to resilience. It also needs to identify and analyze the clusters of CRI's and UCRA's resilience indicators within two documents of RPJMD to compare resilience indicators between CRI and UCRA. How those resilience indicators are explored

and discussed in each chapter within two documents of RPJMD can be used to determine the consistency of resilience indicators for a better development planning policy. Therefore, all those analyses can be conducted to determine which resilience indicators that are compatible, applicable, and suitable for RPJMD. The output of this study is the explanation of the resilience indicators that are compatible, applicable, and suitable for RPJMD in Semarang City.



Source: Analysis, 2020

FIGURE 1.2
RESEARCH FRAMEWORK

1.7 Methods

Research methods are a system to solve a problem that is contained in research activity. Nazir (1988) reveals research methods are an integral part of the research system that consists of procedures and techniques that need to be done in a study. The procedure gives researchers the sequence of work to be done in one study, while the research techniques provide the necessary measurement tools in conducting a study.

The research method in this study is a quantitative content analysis or simply called content analysis. Neuendorf (2002) describes content analysis as "a summarizing, quantitative analysis of messages that relies on the scientific method (including attention to objectivity – intersubjectivity, a priori design, reliability, validity, generalizability, replicability, and hypothesis testing) and is not limited as to the types of variables that may be measured or the context in which the messages are created or presented."

Similarly, Krippendorff (2004) explains that "content analysis is a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use." Three types of inferences are: 1) deductive inferences, which proceed from generalizations to particular; 2) inductive inferences, which proceed from particulars to generalizations; and 3) abductive inferences, that proceed from particulars of one kind to particulars of another kind. This study uses abductive inferences when applying content analysis to two documents of RPJMD. Furthermore, both Neuendorf (2002) and Krippendorff (2004) reveal content analysis can be used to analyze all of the characteristics of messages, including contents that can be seen (manifest) and can not be seen (latent).

The three approaches of content analysis are descriptive, explanative, and predictive (Eriyanto, 2011). This study uses an explanative content analysis approach, wherein this approach also including testing hypotheses. The goals of this type are not only a description of some outcomes or effects of the messages under examination. It also to find out the relationship between the messages and other variables. The focus of content analysis in this study is comparative content analysis. The focus of comparative content analysis in this study is a description

of the message in different communicators and also a description of the message at different times (Holsti, 1969 in Eriyanto, 2011).

In this case, the researcher uses content analysis to compare between two different resilience assessment methods (i.e., CRI and UCRA) to determine which method having resilience indicators that are compatible, applicable, and suitable for RPJMD (i.e., The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD) in Semarang City. Moreover, the content analysis also can explain why those resilience indicators are compatible, applicable, and suitable for RPJMD in Semarang City.

Furthermore, the researcher also uses content analysis to compare the resilience indicators within two documents of RPJMD (i.e., The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD) that is produced in the different time to determine the trend of resilience indicators. To answer that question, hypothesis research for this study are:

H1: There is no significant difference in the frequencies of CRI's resilience indicators within The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD

H2: There is no significant difference in the frequencies of UCRA's resilience indicators within The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD

To explain those hypothetical researches, the researcher uses the design of content analysis based on time order (Holsti, 1969 in Eriyanto, 2011). This time order design is to describe the trend of the message at a different time.

Resilience indicators	Time 1 (t1)	Time 2 (t2)
CRI	The 2016-2021 Semarang RPJMD	Revision of The 2016-2021 Semarang RPJMD
UCRA	The 2016-2021 Semarang RPJMD	Revision of The 2016-2021 Semarang RPJMD

Source: Analysis, 2020

FIGURE 1.3
TIME ORDER DESIGN OF CONTENT ANALYSIS

1.7.1 Data and Technique of Data Collection

The data needed for this research is secondary data. This type of data is written data that originates from the document and often called the documentary data. Secondary data, such as a depiction or a description of the research area as well as other documentary data, are required to support the analysis in this research. Secondary data for analysis in this research are:

- Regional Regulation No. 6 of 2016 about The 2016-2021 Semarang RPJMD
- Regional Regulation No. 11 of 2017 about Revision of The 2016-2021 Semarang RPJMD

Based on the approach of content analysis, the researcher will use data collected from the content analysis method. The analysis focuses on the description of resilience indicators (i.e., CRI and UCRA) be discussed in The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD.

The documents that will be analyzed by content analysis are limited and specific. Those documents should contain the strategy of governance, development planning policies, as well as issues related to resilience. Hence, it is the justification of using "purposive sampling" in this study. Those samples (i.e., RPJMD and its revision) also can be considered as population since the limited number of documents that have high relevance to the purpose of this study. Moreover, those documents also describe the current conditions as well as the want-to-be-achieved conditions in Semarang City.

1.7.2 Analytical Methods

This study applies content analysis as the primary method to describe and compare two types of resilience indicators (i.e., CRI and UCRA) within The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD. This description includes what resilience indicators based on CRI and UCRA are being mentioned in two documents of RPJMD. The researcher also analyses and compares if there are any significant differences in resilience indicators are being mentioned in The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD. This analysis can be used to describe the trend of resilience indicators in those two documents of RPJMD because Revision of The 2016-2021

Semarang RPJMD is a new version and improvement of The 2016-2021 Semarang RPJMD. Moreover, the researcher will identify and analyze what clusters of CRI's and UCRA's resilience indicators within two documents of RPJMD to compare resilience indicators between CRI and UCRA.

Content analysis also gives an illustration of how the government implements resilience thinking into the government's documents. It can be seen from how those resilience indicators are explored and discussed in each chapter within two documents of RPJMD. Furthermore, it also can be used to determine the consistency of resilience indicators for a better development planning policy. All of those analyses are important to examine between CRI and UCRA, which resilience indicators that are compatible, applicable, and in accordance with RPJMD in Semarang City.

Several steps should be done in the content analysis as follows (Neuman 2003 in Martono, 2016):

1. Formulating the objectives of content analysis

   Identify what does the researcher wants to know from content analysis or identifying the objectives of the study.
2. Study literature

   Study literature of the concepts related to the study. It also can be used as a guideline in measurement, formulating hypothetical research, formulate the operational definition, to strengthen argumentation or interpretation data.
3. Identifying variables

   Identify the variables that will be measured in the study. Variables in this study are derived from the study literature.
4. Measurement

   Measurement is the assignment of numerals to objects or events according to rules (Steven's 1951 in Neuendorf, 2002). In the content analysis, we simply need to think of objects or events that are message units. Measurement can be used to determine the unit of observation and unit of analysis, as a guideline when developing a coding sheet, and doing the validity and reliability test.
5. Developing categories and recording instruction in Coding Sheet

This step is part of the measurement. It contains categories of each variable, the definition of each category, and the conversion from qualitative data to quantitative data. It also gives an explanation and instruction for coders when recording/coding the data.

Table I.1.
VARIABLES AND CATEGORISES FOR CONTENT ANALYSIS

Variables		Numeric Code (Categories)	
1	Title of the Document	1	The 2016-2021 Semarang RPJMD
		2	The Revision of 2016-2021 Semarang RPJMD
2	Page number	In sequence	
3	Number of Paragraph Item	In sequence	
4	Number of Picture Item	In sequence	
5	Number of Table Item	In sequence	
6	Chapters in RPJMD and Revision of RPJMD	1	Introduction
		2	General Profile of Region
		3	Regional Finance Profile and Funding
		4	Challenges and Regional Strategic Issues
		5	Visions, Missions, Goals, and Objectives
		6	Strategy, Direction of Policies, and Regional Development Program
		7	Development Funding Framework and Regional Apparatus Program
		8	Performance of Local Government Administration
		9	Closing
7	Resilience indicators based on CRI	1	Safe and affordable housing
		2	Adequate affordable energy supply
		3	Inclusive access to safe drinking water
		4	Effective sanitation
		5	Sufficient affordable food supply
		6	Inclusive labor policies
		7	Relevant Skills and training
		8	Local business development and innovation
		9	Supportive financing mechanisms
		10	Diverse protection of livelihoods following a shock
		11	Robust public health systems
		12	Adequate access to quality healthcare
		13	Emergency medical care
		14	Effective emergency response services
		15	Local community support
		16	Cohesive communities

Variables	Numeric Code (Categories)
	17 Strong city-wide identity and culture
	18 Actively engaged citizens
	19 Effective systems to deter crime
	20 Proactive corruption prevention
	21 Competent policing
	22 Accessible criminal and civil justice
	23 Well-managed public finance
	24 Comprehensive business continuity planning
	25 Diverse economic base
	26 Attractive business environment
	27 Strong integration with regional and global economies
	28 Comprehensive hazard and exposure mapping
	29 Appropriate codes, standards, and enforcement
	30 Effectively managed protective ecosystems
	31 Robust protective infrastructure
	32 Effective stewardship of ecosystems
	33 Flexible infrastructure
	34 Retained spare capacity
	35 Diligent maintenance & continuity
	36 Adequate continuity for critical assets and services
	37 Diverse and affordable transport networks
	38 Effective transport operation and maintenance
	39 Reliable communications technology
	40 Secure technology networks
	41 Appropriate government decision-making
	42 Effective co-ordination with other government bodies
	43 Proactive multi-stakeholder collaboration
	44 Comprehensive hazard monitoring and risk assessment
	45 Comprehensive government emergency management
	46 Adequate education for all
	47 Widespread community awareness and preparedness
	48 Effective mechanisms for communities to engage with government
	49 Comprehensive city monitoring & data management
	50 Consultative planning process Transparent
	51 Appropriate land use and zoning
	52 Robust planning approval proces
8 How the government frame resilience indicators based on CRI within RPJMD and Revision of RPJMD	1 Specific, clearly defined, technical, output-based
	2 Comprehensive, broader manner, outcome-based
	3 Unclear

Variables		Numeric Code (Categories)	
9	Resilience indicators based on UCRA	1	High risks areas
		2	Urban poor housing (Informal housing)
		3	Land subsidence
		4	Rain anomaly (Precipitation)
		5	Sea level rise
		6	Employment profile
		7	Educational profile
		8	Age profile
		9	Gender Equality
		10	Poverty Profile
		11	Disability Profile
		12	Social profile
		13	Access to water distribution network
		14	Access to sewage treatment network
		15	Access to electricity
		16	Access to solid waste collection network
		17	Access to urban health facilities
		18	Access to public transport
		19	Number of educational facilities
		20	Access to storm water drainage
		21	Number of park/open space
		22	Fire protection
		23	Informal social networks
		24	Neighbourhood socializing
		25	Neighbourhood preference
		26	Social activity in communities
		27	Community Led DRR Activities
		28	Community Health Awareness Camps
		29	Access to early warning systems
		30	Evacuation routes and shelter
		31	Access to information centers
		32	Political and City Involvement
		33	Voter Participation
		34	Trust in Community Leader
		35	Non-Governmental Support
		36	Urban services
		37	Mobility
		38	Access to natural features
		39	Construction types
		40	Lighting and ventilation
		41	Perceived climate risk
		42	Practice of disaster risk reduction
		43	Disaster risk reduction kits

Variables	Numeric Code (Categories)
	44 Back-up of documents 45 Cellphone ownership 46 Internet access 47 Access to local news 48 Weather forecast awareness 49 Weather and health awareness 50 Labour and livelihoods 51 Emergency savings 52 Health and life insurance 53 Social security card 54 Willingness to invest in disaster risk reduction 55 Land tenure
10 How the government frame resilience indicators based on UCRA within RPJMD and Revision of RPJMD	1 Specific, clearly defined, technical, output-based 2 Comprehensive, broader manner, outcome-based 3 Unclear

Source: Analysis, 2020

6. Defining unit of analysis

The unit of analysis describes what is to be observed as well as how observation is to be recorded and thereafter considered data. Units are wholes that analysts distinguish and treat as independent elements (Krippendorff, 2004). Unit of analysis in the content analysis as follows (Krippendorff, 2004):

a. Sampling units

Sampling units are units that are distinguished for selective inclusion in the analysis. This study only observed resilience indicators in all chapters in The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD. Therefore sampling units in this study are all chapters in The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD that contained resilience indicators.

b. Recording units

Recording units are units that are distinguished for separate description, transcription, recording, or coding. Recording units for this study uses thematic units. Therefore, aspects that will be recorded are ideas or themes in the items. In this study, the idea or theme that will be recorded is

resilience indicators, and the items are paragraphs, pictures, and tables in all chapters within The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD.

7. Identifying population and samples

   Population and samples in this study are all items (i.e., paragraph, picture, and table) in The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD.

8. Data collection

   Collect all data that are items in documents The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD.

9. Training the coders and doing the validity and reliability test

   Training the coders is necessary when there is more than one person that will do data coding. Thus, there will be the same perception between the coders when doing data coding. Validity and reliability test are using several items as sampling.

10. Coding

    Coders do data coding as instructed in the instruction in the coding sheet (see appendix).

11. Data analysis

    The raw data in the coding sheet will be processed by the data processing technique. Data also will be analyzed using a statistics-test.

12. Data presentation

    Data that has been analyzed will be presented in the form of descriptions, tables, and charts, which are used to show the visual results of the analysis.

13. Data interpretation

    Data interpretation is a process to give meaning to the data that be presented. This step has a crucial role cause it explains the data itself.

14. Compiling report

    The researcher compiles the report to present the result of the content analysis.

1.7.2.1 Reliability Test

Reliability is essential in scientific research. There are three types of reliability: stability, reproducibility, and accuracy. All turn out to be the functions of agreement achieved among observers, coders, judges, or measuring instruments (Krippendorff, 2004). This study uses two coders to do data coding. Therefore to make sure that there will be the same perception between the coders and to minimize the different results when doing data coding, it needs to do a reliability test at first. The researcher uses 281 sample items to do a reliability test. This number of sample items is 10 percent from a total of 2813 items. The proportion of the distribution of sample items for the reliability test can be seen in the table below.

Table I.2.
SAMPLE OF ITEMS FOR RELIABILITY TEST

Item	Number of Items			Sample of Items		
	RPJMD	Revision of RPJMD	Total	RPJMD	Revision of RPJMD	Total
Paragraph Item	1101	1103	2204	110	110	220
Picture Item	69	45	114	7	4	11
Table Item	267	228	495	27	23	50
Total	**1437**	**1376**	**2813**	**144**	**137**	**281**

Source: Analysis, 2020

This study using Cohen's *Kappa* Formula to do intercoder reliability that can be used for two coders or more. Cohen's *Kappa* Formula used is as follows (Neuendorf, 2002):

$$Kappa\ or\ intercoder\ reliability = \frac{PA_O - PA_E}{1 - PA_E} \qquad (1)$$

where PA_O : proportion agreement, observed

PA_E : proportion agreement, expected by chance

1.7.2.2 Data Analysis

a. Clustering

According to Krippendorff (2004), clustering is popular in the content analysis because it is based on intuitively meaningful similarities among units of analysis, and its resulting hierarchies resemble the conceptualization of text on various levels of abstraction. Procedurally, clustering either works from the bottom up, by lumping together objects, attributes, concepts, or people according to what they share or proceeds from the top down, by dividing sets of such entities into classes whose boundaries reflect the more important differences between them. The direction that clustering takes results from the analyst's choices of the similarity measure and the clustering criterion. Clustering techniques differ widely regarding these. A contingency is but one similarity measure; others are agreement, correlation, proximity, the number of shared attributes, and common meanings, either by semantic definition or by relations within a thesaurus.

In this study, the clustering techniques are used to determine the themes of resilience indicators. Resilience indicators which have the similarities will be grouped in the same theme. The results obtained will describe the comparison of resilience indicators between CRI and UCRA. Thus, it can be used to answer the question "between CRI and UCRA, which method having resilience indicators that are compatible, applicable, and suitable for RPJMD (i.e., The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD) in Semarang City".

b. Chi-Square Test

Chi-Square Test (χ^2) is commonly used for testing relationships between categorical variables. It means Chi-Square can be used if the scale of data is nominal. The null hypothesis of the Chi-Square Test is that no relationships exist on the categorical variables in the population; they are independent. The calculation of the Chi-Square Test is as follows:

$$\chi^2 = \sum \frac{(O-E)^2}{E} \quad (2)$$

where χ^2 :Chi Square

O : the observed frequency

E : the expected frequency

In content analysis, Chi-Square Test is one of statistical test for comparative content analysis (Eriyanto, 2011). This study uses comparative content analysis based on time order to describe the trend of the message at a different time. The researcher uses Chi-Square Test to investigate if there is any significant difference in the frequencies of CRI's and UCRA's resilience indicator within The 2016-2021 Semarang RPJMD and Revision of The 2016-2021 Semarang RPJMD. To determine whether the value of χ^2 is significant or not, it should be done by comparing the actual value against a critical value found in a Chi-Square distribution. This study uses a significant level of 5%. Thus, it can answer the hypothesis researches in this study.