Content Analysis of Resilience Indicators for Mainstreaming Resilience into Semarang City's Development Planning Policies

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Abstract

Resilience assessment has been conducted in Semarang City by two different organizations using two different methods, i.e., City Resilience Index (CRI) and Urban Community Resilience Assessment (UCRA) in 2017 and 2018. Based on the result of those resilience assessments, it reveals that some of the resilience indicators are not suitable for local conditions in Semarang City regarding development planning policies. City strategic planning is a mid-term development planning policy with a combination of sectoral planning and comprehensive planning to budgeting process of the local government programs. It also includes local government performance indicators that reflect the level of good governance and lead to enhance city resilience. Hence, indicators in city strategic planning also can be considered as resilience indicators. All of this implies that city strategic planning describes the local government already uses resilience thinking in its strategies, policies, and programs. However, city resilience encompasses many aspects and more complex. This study aims to identify between CRI and UCRA, which method having resilience indicators that are compatible, applicable, and suitable for Semarang's city strategic planning. CRI and UCRA use different methods and aim at different scopes when assessing resilience in the city. The results of the content analysis on the document of development planning policies, such as the 2016-2021 Semarang's city strategic planning and Revision of the 2016-2021 Semarang's city strategic planning, highlight the similarities and differences between CRI and UCRA. It reveals that CRI's resilience indicators are more compatible, applicable, and suitable for Semarang's city strategic planning rather than UCRA's resilience indicators.

Keywords: city resilience index; city strategic planning; content analysis; development planning policy; resilience indicators; urban community resilience assessment

1. Introduction

The term of resilience have been applied in many discipline studies from natural science to social science. Each of discipline studies has its interpretation about resilience, however it still rooted in the equilibristic view of resilience with an emphasis on bounce-back ability (Davoudi, 2012; Folke, 2006; Simmie & Martin, 2010; White & O'Hare, 2014). This ability is important 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 commonly found in the cities which explaining why many governments and decision-makers used the term of resilience in their policies and strategies (Porter & Davoudi, 2012; Shaw, 2012; White & 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 & McEnvoy, 2012; White &

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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 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). Therefore, the term of resilience should be defined in the same perspective among stakeholders and decision-makers, especially in the context of "resilience for whom and against what?" (Leach, 2008; Vale, 2014; White & O'Hare, 2014; Wilkinson, 2012). It is very important in order to implementing 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 (Jabareen, 2013; Wilkinson, 2012).

Many literatures of resilience assessment, in the context of urban resilience, mostly focuses 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 disadvantages groups which often forgotten in dimension of resilience rooted from engineering and ecology (Vale, 2014). As explained in Romero-Lankao et al. (2016), 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 leaves 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. Resilience Alliance has developed methodology and framework emphasizes on the dynamics of resilience in social—ecological systems (Resilience Alliance, 2010). World Resources Institute (WRI) has developed Urban Community Resilience Assessment (UCRA), a tool to help cities measure vulnerabilities, resilience capacities, access to services, information, social networks, and financial resources across neighbourhoods (Rangwala et al., 2018). ARUP also has developed City Resilience Index (CRI), a tool to measure and monitor the multiple factors (i.e., strengths and weaknesses) that contribute to city resilience framework. CRI is developed based on City Resilience Framework (CRF) that determined by four dimensions, 12 goals and 52 indicators cities (The Rockefeller Foundation & ARUP, 2015).

Semarang City is the first city in Indonesia who joining the 100 Resilient Cities (100RC) program. The attempt of Semarang City to build resilience has been through a long journey that started since Semarang City became a part of the Asian Cities Climate Change Resilience Network (ACCCRN) program in 2009. Semarang City has worked to develop a Urban Climate Resilience Strategy (UCRS), a prioritized actions reducing vulnerability to climate change (ISET, 2010; Sutarto & Jarvie, 2012). As participant of 100RC, Semarang City also developed City Resilience Strategy (CRS) which using CRF as their framework in 2016. CRS consists of 6 pillars of strategy which are divided into 18 city resilience strategies and 53 city resilience initiatives. 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 a feedback for government when implementing CRS. One of these tools is CRI.

Arup has conducted resilience assessment in Semarang City using CRI in 2017. Moreover, another resilience assessment also conducted in 2018 by WRI using UCRA. Since Semarang City uses CRF as a base framework when developing CRS thus CRI is compatible tool for measuring resilience in Semarang City. However, CRI is developed for measuring resilience in various cities therefore it consists of mixture indicators that can be used for common situation and specific situation. Hence, there are some indicators in CRI that are not suitable with local condition in certain city such as Semarang City. It relates with city's policies, social capital, institutions and city's physical assets. As 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 different approach to assess resilience in Semarang City. Despite UCRA focuses on resilience assessment at community level, it also considers resilience assessment at city scale. Hence, there is the possibility that some CRI's indicators are 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 condition in Semarang City in order 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 flooding. 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 framework are needed when implementing resilience in development policy (Handayani et al., 2019). Thus, it indicates that resilience and development planning policies have close correlation.

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. In contrast, Law No. 26, 2007, provides details about the spatial planning system in Indonesia.

In this study, development planning policies in Semarang City refer to regional mid-term development planning or city strategic planning. This city strategic planning is the five years plan document of the development planning policy. It also plays a vital role for the city development planning. City strategic planning, 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). It consists of the visions and missions of the Head of Region that is chosen every five years. It 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, regional long-term development planning also includes the combination of sectoral planning and comprehensive planning for 20-years plan, and should be used as reference in compiling city strategic planning. However, because of this long-term type, regional long-term development planning 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 city strategic planning for content analysis of resilience indicators.

This study uses two documents of city strategic planning that are The 2016-2021 Semarang's city strategic planning and Revision of The 2016-2021 Semarang's city strategic planning. Both two documents of city strategic planning consist of vision, mission, guidelines of development planning, and programs for five years plan. Revision of The 2016-2021 Semarang's city strategic planning is the new version of The 2016-2021 Semarang's city strategic planning. It is because there are some changes in the rules and the regional apparatus work unit in the Semarang Municipality. Moreover, based on the evaluation of The 2016-2021 Semarang's city strategic planning, some contents in the documents are not compatible with the new rules of the National Government. Therefore, Revision of The 2016-2021 Semarang's city strategic planning contains the substantial changes of the contents in The 2016-2021 Semarang's city strategic planning. Thus, this study uses these two documents of city strategic planning to investigate whether there are changes in context of resilience. From the statement before, this study aims to identify between CRI and UCRA, which method having resilience indicators that are compatible, applicable, and suitable for development planning policies in Semarang City.

2. Research Method

This study applies content analysis as the main method to describe and compare between two types of resilience indicators (i.e., CRI and UCRA) within two documents of Semarang's city strategic planning. Content analysis is a research technique to investigate the message of content for making replicable and valid inferences from text (or other meaningful matter) to the contexts of their use (Krippendorff, 2004; Neuendorf, 2002). 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 (Krippendorff, 2004). This study uses abductive inferences when applying content analysis to two documents of city strategic planning. 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. Focus of comparative content analysis in this study are the description of the message in the different comunicators and also the description of the message in the different times (Holsti, 1969 in Eriyanto, 2011).

To identify between CRI and UCRA, which method having resilience indicators that are compatible, applicable, and suitable for development planning policies in Semarang City, there are several objectives of content analysis in this study: (1) to analyze what resilience indicators based on CRI and UCRA are discussed within two documents of Semarang's city strategic planning; (2) to identify and analyze the clusters of CRI's and UCRA's resilience indicators within two documents of Semarang's city strategic planning to compare resilience indicators between CRI and UCRA; and (3) to analyze how the government explores and discusses those resilience indicators in each chapter within two documents of Semarang's city strategic planning to determine the consistency of resilience indicators for better development planning policy.

Those objectives of content analysis and literature study play crucial role to determine and identify the variables and categories that will be measured in the study. For example, the researcher want to analyze what resilience indicators based on CRI and UCRA are discussed within two documents of Semarang's city strategic planning. Based on literature study, Resilience indicators based on CRI consist of 52 categories (The Rockefeller Foundation & ARUP, 2015) while resilience indicators based on UCRA divided into 55 categories (World Resources Institute et al., 2018). Hence, the researcher uses CRI and

UCRA as variables, while the researcher uses all of those resilience indicators as categories for each variable in content analysis. The researcher also want to analyze how the government explores and discusses those resilience indicators in each chapter within two documents of Semarang's city strategic planning to determine the consistency of resilience indicators for better development planning policy. Thus, how the government frame those resilience indicators and chapters in two documents of Semarang's city strategic planning can also be considered as variables.

In this study, there are ten variables for content analysis which derived from literature study (see Table 1). However, five variables in Table 1 can not be used as analytical tools. The researcher uses those variables as an identity data when coders do data coding. Those variables are: 1) title of the document, 2) page number, 3) number of paragraph item, 4) number of picture item, and 5) number of table item. The researcher uses the other five variables as analytical tools for content analysis. Those variables are: 1) chapters in two documents of Semarang's city strategic planning, 2) resilience indicators based on CRI, 3) how the government frame resilience indicators based on CRI within two documents of Semarang's city strategic planning, 4) resilience indicators based on UCRA, and 5) how the government frame resilience indicators based on UCRA within two documents of Semarang's city strategic planning. Those variables are divided into several categories. Numeric codes are used to distinguish each category within variable. This numeric codes also can be used to record the data into coding sheet.

Defining unit of analysis plays important role in content analysis. Unit of analysis describes what is to be observed as well as how observation are to be recorded and thereafter considered data. Units are wholes that analyist distinguish and treat as independent elements (Krippendorff, 2004). Unit of analysis in content analysis as follows: (a) Sampling units are units that are distinguished for selective inclusion in an analysis (Krippendorff, 2004). This study only observed resilience indicators in all chapters in two documents of Semarang's city strategic planning. Therefore sampling units in this study are all chapters in two documents of Semarang's city strategic planning that contained resilience indicators; and (b) Recording units are units that are distinguished for separate description, transcription, recording or coding (Krippendorff, 2004). Recording units for this study uses thematic units. Therefore, aspects that will be recorded are idea or theme 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 two documents of Semarang's city strategic planning.

Table 1: Variables and Categories for Content Analysis

	Variables	Numeric Code (Categories)		
1	Title of the Document	1. The 2016-2021 Semarang's city strategic planning 2. The Revision of 2016-2021 Semarang's city strategic planning		
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 two documents of Semarang's city strategic planning	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 dringking water 4. Effective sanitation 5. Sufficient affordable food supply 6. Inclusive labour policies 7. Relevant skills and training 8. Local business development and innovation 9. Suportive financing mechanishms	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	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

Table 1 continued

Variables	Numeric Code (Categories)		
	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 17. Strong city-wide identity and culture 18. Actively enganged citizens	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	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 process
8 How the government frame resilience indicators based on CRI within two documents of Semarang's city strategic planning	1. Specific, clearly defined, technical, there is a spesific measure of the results that want to be achieved 2. Comprehensive, broader manner, there are obvious benefit that can be achieved 3. Unclear		
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 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 two documents of Semarang's city strategic planning	1. Comprehensive, broader manner, there are obvious benefit that can be achieved 2. Specific, clearly defined, technical, there is a spesific measure of the results that want to be achieved 3. Unclear		

3.   Result and Discussion
3.1   Description and Comparison of Resilience Indicators based on CRI and UCRA

Content analysis in this study describes what resilience indicators based on CRI and UCRA are discussed within two documents of Semarang's city strategic planning. There are a total of 2813 items as recording units that have been observed and analyzed in this content analysis. However, a content analysis shows that there are items that do not contain resilience indicators. The researcher uses Chi Square Test (χ^2) in content analysis to investigate the trend of resilience indicators by comparing resilience indictors within two document produced at different time (i.e., The 2016-2021 Semarang's city strategic planning and Revision of The 2016-2021 Semarang's city strategic planning). The hypothesis researches to answer this questions are: (a) H1 : There is no significant difference in the frequencies of CRI's resilience indicators within two documents of Semarang's city strategic planning; (b) H2 : There is no significant difference in the frequencies of UCRA's resilience indicators within two documents of Semarang's city strategic planning.

Table 2: Trend of Resilience Indicators based on CRI and UCRA in Two Documents of Semarang's City Strategic Planning

Resilience Indicators	The 2016-2021 Semarang's city strategic planning (Frequency)	Revision of The 2016-2021 Semarang's city strategic planning (Frequency)	Chi Square Test (χ^2)
CRI (52 indicators)	2502	2665	χ^2 = 12.12, df* = 51, p>0.05
UCRA (55 indicators)	1121	1247	χ^2 = 9.55, df* = 54, p>0.05

*df: the degree of freedom

Table 2 reveals that there are increasing frequencies of both resilience indicators (i.e., CRI's and UCRA's indicators) within two documents of Semarang's city strategic planning. However, the chi-square test's value confirms that those increasing frequencies of CRI's and UCRA's resilience indicators are not significant. It means that it is no significant differennce in the trend of resilience indicators based on CRI and UCRA within two documents of Semarang's city strategic planning. This also explains that although Revision of The 2016-2021 Semarang's city strategic planning is a new version and has content improvement from The 2016-2021 Semarang's city strategic planning, there is no substantial improvement related to resilience indicators in Revision of The 2016-2021 Semarang's city strategic planning. It implies that the concern of city resilience in Semarang City has increase but not significant enough.

Furthermore, distribution frequency of CRI's and UCRA's resilience indicators exposes that not all of resilience indicators are mentioned in two documents of Semarang's city strategic planning (see Fig.1). From 55 resilience indicators based on UCRA, three of them do not appear in the documents: (1) Informal social networks; (2) Neighborhood preference; and (3) Trust in Community Leader. On the other hand, 52 resilience indicators based on CRI, all of them appear in the documents although three CRI's resilience indicators have frequencies less than 10 such as: (1) Diverse protection of livelihoods following a shock; (2) Competent policing; and (3) Accessible criminal and civil justice.

Those resilience indicators that do not appear in the documents indicate that those indicators are a little relevant to the Semarang Municipality's performance and programs. Moreover, those three UCRA's resilience indicators are related to the interaction inside the local community and can be obtained through field survey. Hence, those resilience indicators consist of specific and detailed information in certain location as a part of the city and can not be used to describe all of place in the city. While Semarang Municipality requires general data and information to be included in the documents of city strategic planning that can be used to represent the comprehensive condition of the city.

On the other hand, resilience indicators that have frequencies less than 10, it indicates that Semarang Municipality regards those resilience indicators as general indicators but there are limited data related to those resilience indicators. Furthermore, from those resilience indicators that have frequencies less than 10, there are also resilience indicators which aren't included in the responsibility of Semarang Municipality (i.e., Competent policing and Accessible criminal and civil justice in CRI's resilience indicators). Both Competent policing and Accessible criminal and civil justice are included in the scope of authority of National Government. Meanwhile, the document of development planning policy such as city strategic planning consists of visions and missions of the chosen leaders (i.e., Mayor and Vice-Mayor of Semarang City). Hence, there is limitation of those two CRI's resilience indicators be mentioned in the documents. However, there are also some indicators and programs within the documents that can support the safety and security in the city.

Figure 1 confirms that frequency distribution of CRI's resilience indicators are better than UCRA's. It implies that CRI's resilience indicators are more compatible with the indicators in the documents of city strategic planning that used by Semarang Municipality. Resilience indicators with high frequencies, it indicates that the Semarang Municipality regards those indicators as important indicators in the development planning policy.

3.2 Clustering of CRI's and UCRA's Resilience Indicators

Using cluster analysis, the researcher will analyze and divide resilience indicators based on CRI and UCRA into several groups to compare resilience indicators between CRI and UCRA. This analysis uses

the similarities between resilience indicators to determine the clusters. In this case, the researcher uses some themes to classify resilience indicators into several clusters. Table 3 represents eight clusters of resilience indicators based on CRI and UCRA that classified based on the similarity of character and theme. For example, the Health cluster consists of two CRI's indicators and four UCRA's indicators. CRI's indicators in this Health cluster are about public health systems and the quality of public healthcare. Thus, it indicates that CRI's indicators talks about public health in general or the city's scale. On the other hand, UCRA's Health cluster indicators are about the building health awareness to the communities. It implies that there are two indicators in UCRA focused on health awareness in specific and certain area of the city.
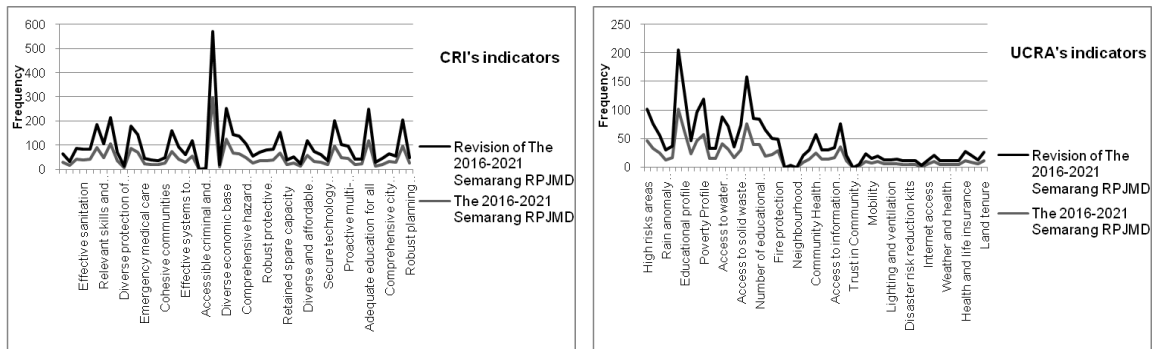

Figure 1. Frequency Distribution of CRI's and UCRA's Resilience Indicators in Two Documents of Semarang's city Strategic Planning

Empowered stakeholders are a cluster about the efforts to enchance human rescources quality and increase citizen participation in the city's political and development planning. CRI's indicators in this cluster focus on education and communities's mechanism to engage with the government. While UCRA's indicators also give attention to education and participation in city involvement, but it also talks about gender equality and participation in politics.

The Disaster management cluster consists of the characteristics of disaster mitigation, emergency responses, the following efforts after the disaster happens, and the infrasctructures related to disaster management. There are seven CRI's resilience indicators in this cluster. Those seven indicators are quite comprehensive because it includes disaster mitigation, emergency responses, and the following efforts after the disaster happens. However, those indicators are in general and at the city's level.

On the other hand, UCRA's resilience indicators in the Disaster management cluster are more detailed and specific. Some of UCRA's resilience indicators (i.e., land subsidence, rain anomaly, and sea-level rise) are related to specific disaster in Semarang City, such as land subsidence, flood, and tidal flood. Most of the indicators in UCRA focuses on building community awareness and preparedness, such as early warning systems, community-led DRR activities, etc. Social welfare and wellbeing are a cluster about indicators related to social welfare and livelihoods. CRI's resilience indicators focus on economic perspective and livelihoods in order to enhance social welfare and wellbeing. In contrast, UCRA's resilience indicators give more attention to social perspectives such as poverty profile, disability profile, social security card, and non-governmental support in to reduce the gap in social welfare and wellbeing.

Culture and society cluster are related to the culture and the social interaction between communities that becomes the city's identity. Indicators in CRI talk about culture and local communities in a general and broad manner. It can be seen that there are only three CRI indicators in this cluster, while there are seven UCRA indicators. On the other hand UCRA's indicators focus on social interaction inside the local community. It can be seen from indicators such as social profile, informal social networks, neighbourhood socializing, neighbourhood preference, social activity in communities, and trust in community leader. General infrastructures and ecosystems are a cluster about the infrastructures and ecosystems in the city. CRI's indicators in this cluster discuss the infrastructures and ecosystems provided in the city, including their maintenance and their capacities. In contrast, UCRA's indicators focus on how communities access to the infrastructures. UCRA also mentions specific and detailed infrastructures in their indicators, while CRI's indicators are more general and comprehensive.

Governance is a cluster about the performance of the government. There are eleven CRI's indicators and one UCRA's indicator in this cluster. Thus, it can be seen that CRI's indicators give more attention to good governance in terms of resilience. Meanwhile, UCRA's indicator in this cluster is the land tenure that focuses on the individual ownership of the properties. However, from another perspective, it can be said that land tenure is about how the government provides the assurance of property rights for its citizens. The Economy cluster talks about the urban economy and economic growth in the city. This cluster only has five CRI's resilience indicators and no UCRA's indicators. It means that CRI's indicators are including economic perspective in order to build resilience in the city. On the other hand, there is no UCRA's indicator in this cluster because of UCRA build their indicators based on the community's resilience.

Based on those eight clusters, the General Infrastructure and Ecosystems are a cluster with the most numbers of resilience indicators for CRI and UCRA (see Table 2). The next most numbers of resilience indicators is the Disaster Management cluster. However, this cluster are dominated by UCRA's resilience

indicators. It describes that both CRI and UCRA give more attention to General Infrastructure and Ecosystem and Disaster Management in terms of resilience indicators. The Semarang Municipality also has a deep concern in the General Infrastructure and Ecosystem cluster and the Disaster Management cluster. The high frequencies of resilience indicators in those two clusters within two documents of Semarang's city strategic planning indicates this deep concern (see Figure 2). It is reasonable why those two clusters are given more attention since general infrastructures, ecosystems, and disaster management are important to ensure the survival of the city in the face of external shocks such as natural hazards and disasters. How the government manages general infrastructures, ecosystems, and disaster management play an essential role in allocating limited resources, building the capability, and adaptive ability in the city.

Table 3: Clusters of Resilience Indicators

	Clusters		CRI's Resilience Indikators	Freq (N= 5167)		UCRA's Resilience Indikators	Freq (N= 2331)
1	Health	1	Robust public health systems	180	1	Access to urban health facilities	158
		2	Adequate access to quality healthcare	146	2	Community Health Awareness Camps	58
					3	Weather and health awareness	12
					4	Health and life insurance	28
			Total	326		Total	256
			Number of Resilience Indicators	2		Number of Resilience Indicators	4
2	Empowered stakeholders	1	Actively enganged citizens	93	1	Educational profile	132
		2	Adequate education for all	248	2	Gender Equality	97
		3	Effective mechanisms for communities to engage with government	45	3	Number of educational facilities	85
					4	Political and City	77
					5	Involvement	22
						Voter Participation	
			Total	386		Total	413
			Number of Resilience Indicators	3		Number of Resilience Indicators	5
3	Disaster management	1	Emergency medical care	48	1	High risks areas	102
		2	Effective emergency response services	39	2	Land subsidence	56
					3	Rain anomaly (Precipitation)	31
		3	Comprehensive hazard and exposure mapping	106	4	Sea level rise	37
		4	Comprehensive hazard monitoring and risk assessment	43	5	Access to storm water drainage	78
		5	Comprehensive government emergency management	44	6	Fire protection	36
		6	Widespread community awareness and preparedness	29	7	Community Led DRR Activities	31
					8	Access to early warning systems	31
		7	Diverse protection of livelihoods following a shock	14	9	Evacuation routes and shelter	31
		8	Robust protective infrastructure	80	10	Access to information centers	35
					11	Perceived climate risk	15
					12	Practice of disaster risk	12
					13	reduction	
						Disaster risk reduction kits	12
					14	Back-up of documents	12
					15	Access to local news	22
					16	Weather forecast awareness	12
					17	Labour and livelihoods	12
					18	Emergency savings	12
					19	Willingness to invest in disaster risk reduction	14
			Total	403		Total	591
			Number of Resilience Indicators	8		Number of Resilience Indicators	19
4	Social welfare and Wellbeing	1	Sufficient affordable food supply	85	1	Employment profile	205
		2	Inclusive labour policies	186	2	Poverty Profile	119
		3	Relevant skills and training	106	3	Disability Profile	34
		4	Local business development and innovation	214	4	Non-Governmental Support	5
		5	Suportive financing mechanishms	73	5	Social security card	22
			Total	664		Total	385
			Number of Resilience Indicators	5		Number of Resilience Indicators	5

Table 3 continued

	Clusters		CRI's Resilience Indikators	Freq (N= 5167)		UCRA's Resilience Indikators	Freq (N= 2331)
5	Culture and Society	1	Local community support	38	1	Age profile	47
		2	Cohesive communities	50	2	Social profile	33
		3	Strong city-wide identity and culture	161	3	Informal social networks	0
					4	Neighbourhood socializing	4
					5	Neighbourhood preference	0
					6	Social activity in	21
					7	communities	0
						Trust in Community Leader	
			Total	249		Total	105
			Number of Resilience Indicators	3		Number of Resilience Indicators	7
6	General infrastruc-tures and ecosystems	1	Safe and affordable housing	65	1	Urban poor housing (Informal housing)	76
		2	Adequate affordable energy supply	33	2	Access to water distribution network	89
		3	Inclusive access to safe drinking water	89	3	Access to sewage treatment network	73
		4	Effective sanitation	84	4	Access to electricity	36
		5	Appropriate codes, standards and enforcement	57	5	Access to solid waste collection network	74
		6	Effectively managed protective ecosystems	72	6	Access to public transport	86
		7	Effective stewardship of ecosystems	84	7	Number of park/open space	51
		8	Flexible infrastructure	154	8	Urban services	24
		9	Retained spare capacity	39	9	Mobility	16
		10	Diligent maintenance & continuity	54	10	Access to natural features	20
		11	Adequate continuity for critical assets and services	25	11	Construction types	14
		12	Diverse and affordable transport networks	120	12	Lighting and ventilation	14
		13	Effective transport operation and maintenance	76	13	Cellphone ownership	4
		14	Reliable communications technology	63	14	Internet access	14
		15	Secure technology networks	36			
			Total	1051		Total	591
			Number of Resilience Indicators	15		Number of Resilience Indicators	14
7	Governance	1	Effective systems to deter crime	63	1	Land tenure	27
		2	Proactive corruption prevention	118			
		3	Competent policing	2			
		4	Accessible criminal and civil justice	4			
		5	Appropriate government decision-making	201			
		6	Effective coordination with other government bodies	103			
		7	Proactive multi-stakeholder collaboration	97			
		8	Comprehensive city monitoring & data management	64			
		9	Consultative planning process Transparent	57			
		10	Appropriate land use and zoning	204			
		11	Robust planning approval process	51			
			Total	964		Total	27
			Number of Resilience Indicators	11		Number of Resilience Indicators	1
8	Economy	1	Well-managed public finance	570			
		2	Comprehensive business continuity planning	20			
		3	Diverse economic base	253			
		4	Attractive business environment	144			
		5	Strong integration with regional and global economies	137			
			Total	1124		Total	0
			Number of Resilience Indicators	5		Number of Resilience Indicators	0

UCRA's resilience indicators dominate the Culture and Society cluster. However, three UCRA's indicators in this cluster do not appear in two documents of Semarang's city strategic planning. On the other hand, CRI's resilience indicators dominates the Governance cluster and the Economy cluster (see

Table 3). It reveals that resilience indicator based on UCRA have less concern about governance and the economic aspect of the city. It is consistent with the approach of UCRA, which giving more concern about community resilience, while CRI pays more attention to the city resilience. However, content analysis reveals that the Semarang Municipality regards resilience indicators in the Governance cluster and the Economy cluster as an important. It can be seen by high frequencies of resilience indicators in those two clusters (see Figure 2).

Clustering of CRI's and UCRA's resilience indicators describes the similar characteristics of indicators in the same cluster. However, it also reveals the differences between CRI's and UCRA's resilience indicators in the same cluster. Moreover, those differences also highlight the different approach of CRI and UCRA. It reveals that UCRA has little attention about resilience indicators in terms of governance and the economic aspect of the city. While CRI's resilience indicators are more comprehensive, UCRA's resilience indicators are more specific and detailed rather than CRI's.

3.3 Consistency of Resilience Indicators in Each Chapter within The Documents of Semarang City's Development Planning Policy

This analysis investigates the consistency of resilience indicators in the documents of development planning policy by analyzing the distribution frequency of resilience indicators in each chapter within two documents of Semarang's city strategic planning. In this content analysis, the researcher divides those two documents of Semarang's city strategic planning into nine chapters. However, from nine chapters within the documents of city strategic planning, it can be said that resilience indicators have a good consistency when they are being mentioned in Chapter 2, 4, 5, 6, 7 and Chapter 8. Because in terms of resilience indicators, it reveals current situations, what challenges and issues related to those indicators, and how the leaders and the government respond to those challenges and issues. It also describes what kind of strategies, policies, and regional development programs, what kind of program and funding plan from each regional government institution, and what kind of selected indicators were used to assess the government's performance. Table 3 helps to identify the consistency of resilience indicators based on CRI and UCRA within each cluster.

Table 4: Consistency of Resilience Indicators based on CRI and UCRA in Two Documents of Semarang's City Strategic Planning

Clusters	Consistency of CRI's Resilience Indicators				Consistency of UCRA's Resilience Indicators			
	Good	Medium	Poor	Total	Good	Medium	Poor	Total
Health	2	0	0	2	2	1	1	4
Empowered Stakeholders	3	0	0	3	4	1	0	5
Disaster Management	5	2	1	8	7	5	7	19
Social Welfare and Wellbeing	4	1	0	5	2	1	2	5
Culture and Society	2	1	0	3	1	2	4	7
General Infrastructures and Ecosystems	12	3	0	15	6	3	5	14
Governance	8	1	2	11	0	1	0	1
Economy	4	1	0	5	0	0	0	0
Total	40	9	3	52	22	14	19	55

Note: Good   : being mentioned in all of chapter 2, 4, 5, 6, 7, and 8
           Medium : from chapter 2, 4, 5, 6, 7, and 8, being mentioned in 3 – 5 chapters
           Poor   : from chapter 2, 4, 5, 6, 7, and 8, being mentioned in 1 – 2 chapters

Table 4 reveals several notable findings. The consistency of resilience indicators represent how the Semarang Municipality applies resilience indicators in their policy as decision-makers. Good consistency indicates that resilience indicators are not just meaningful concept but already implemented in their strategies, programs, and budget allocation. Meanwhile, poor consistency implies that resilience indicators are just seen as a meaningful concept or due to lack of data; thus, it can not be applied in their strategies, programs, and budget allocation. Another reason is the government's structure in Indonesia cities, which defines the different authorities. For example, Competent policing and Accessible criminal and civil justice are CRI's resilience indicators with poor consistency that included in the scope of the police department and law departement. Hence, the Semarang Municipality can not apply those two resilience indicators in their strategies, programs, and budget allocation. However, the Semarang Municipality has other strategies, programs, and budget allocation that support the city's security and safety, helping the police department and law department. Table 3 describes that CRI's resilience indicators have better consistency rather than UCRA's in each cluster. Empowered Stakeholders are a cluster with the best consistency among those eight clusters. In this cluster, there is no resilience indicator with poor consistency, only one resilience indicator with medium consistency that is UCRA's. In contrast, Disaster Management is a cluster

with the lowest consistency. Eight resilience indicators in this cluster are poor consistency, and seven of them are UCRA's.

Eight clusters in the previous analysis represent all of the aspects of the city that are required in order to construct city resilience. The city is a complex system with each system intersect with other systems. Thus, an integrated system in the city can enhance the city management, especially in response to uncertainty, changing and challenges in the city. Therefore, resilience indicators in each cluster are important to increase the level of city resilience. The more comprehensive resilience indicators reveal a higher level of city resilience. Furthermore, the study literature finds out the relationships between policy and resilience. How the government, as the decision-makers frame the issues is a key to increase the level of resilience. It also reveals that when the issues were framed in a broader manner, policy implementation tended to enhance characteristics that supported the ability to manage resilience, including flexibility and learning (Adger et al., 2011). In this case, the content analysis also describes that in each cluster, the Semarang Municipality tends to frame resilience indicators in a comprehensive and broad manner rather than in specific and technical details (see Figure 2). Thus, it indicates that there is a room to increase resilience in the development planning policy such as city strategic planning. Figure 2 presents that resilience indicators are most frequently-used in several clusters (i.e., economy, governance, general infrastructure, disaster management). It indicates that the term resilience already applied in various context.
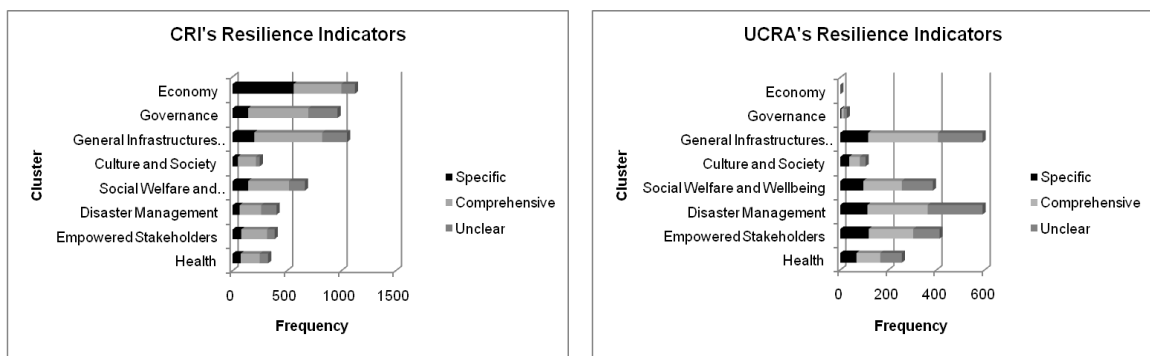

Figure 2. Frequencies of How The Government Frame Resilience Indicators

Content analysis describes the similarities and difference characteristics of resilience indicators between CRI and UCRA to determine which methods having resilience indicators that compatible, applicable, and suitable for RPJMD. The following table reveals these similarities and difference of CRI's and UCRA's resilience indicators as shown in Table 5.

Table 5: Characteristics of CRI's and UCRA's Resilience Indicators based on Content Analysis

Characteristics	CRI	UCRA
Completeness of the resilience indicators that appear in two documents of RPJMD	All of 52 resilience indicators appear in two documents of RPJMD	Three of 55 resilience indicator do not appear in two documents of RPJMD
Completeness of resilience indicators in eight clusters	All eight clusters contain resilience indicators	One of eight clusters, i.e., Economy cluster, do not contain resilience indicators
Cluster with the most number of resilience indicators	General infrastructures and ecosystems cluster covers 15 CRI's resilience indicators	Disaster management cluster consists of 19 UCRA's resilience indicators
Consistency of resilience indicators in each cluster	Dominated by good consistency of resilience indicators in each cluster	The number of resilience indicators with a good and a poor consistency are slightly different
How the government discuss resilience indicators in two documents of RPJMD	The government tends to discuss resilience indicators in the comprehensive and broadly manner	The government tends to discuss resilience indicators in the comprehensive and broadly manner

Overall, all the previous analysis discovers that CRI's resilience indicators are more compatible and suitable for Semarang City conditions in in terms of development planning policy, such as city strategic planning. Moreover, the similarities and differences of CRI's and UCRA's resilience indicators also reveals the compatibility and suitability of CRI's indicators with RPJMD (see Table IV.6). It also confirms that CRI is in line with Semarang's city strategic planning because both of them use the same scope, i.e., the city's scale. CRI is a tool to measure city resilience. Thus, the indicators in CRI are comprehensive and can encompass the complex systems of the city. City strategic planning is the five years plan document of the development planning policy. It contains strategies, programs, budget allocations, and indicators to assess the local government's performance. Meanwhile, UCRA is a tool to measure community resilience. Hence, UCRA has a different scope level with CRI and city strategic planning.

4.   Conclusion

Two methods of resilience assessment in Semarang City, i.e., CRI and UCRA, use a different approach and aim difference scopes for measuring resilience. CRI consists of resilience indicators to measure resilience at the city's scale. Meanwhile, UCRA focuses on resilience indicators to assess resilience at the community's scale. Content analysis of resilience indicators on the documents of RPJMD highlights the similarities and differences between those two methods. It also uses to identify that between CRI and UCRA, CRI's resilience indicators are compatible, applicable, and suitable for Semarang's city strategic planning based on as follows: (1) the complete appearance of all 52 CRI's indicators in two documents of city strategic planning reflect that all those indicators can be applied in city strategic planning, while three of 55 UCRA's indicators are not mentioned in two documents of city strategic planning (i.e., Informal Social Networks, Neighborhood Preference, and Trust in Community Leader); (2) the appearance of CRI's resilience indicators in all eight clusters indicates that CRI comprises all of the city aspects, while UCRA's indicators do not appear in one cluster, (i.e., Economy cluster); (3) CRI's resilience indicators have better consistency than UCRA's in each cluster, representing how the Semarang Municipality applied resilience indicators in their policy as decision-makers; and (4) the Semarang Municipality tends to frame resilience indicators comprehensively and broadly rather than in specific and technical details that align with the CRI approach that also implies the compatibility between CRI and city strategic planning.

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