Creating City Growth Narratives from Different Disciplinary Perspectives:

An application to land use and transport development in an Indonesian City

by

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

Cities are entities that involve a variety of elements, both physical and nonphysical, and can be understood from different disciplinary perspectives. However, nearly all past analyses of cities, particularly with respect to transport, have been conducted in accordance with specific disciplinary perspectives, thus neglecting factors that are not covered by the discipline concerned.

This thesis develops a methodology to create narratives, both past and future, of city growth from different disciplinary perspectives concerning land use and transport development. It conducts a multidisciplinary study in expecting to understand the growth of the city from multiple perspectives. Moreover, it shall be useful in creating city growth policies as the methodology tries to think differently in defining the future of the city. The methodology is developed by creating a classification framework, based upon nine criteria that can be used to understand different views within the disciplines of transport studies, economics, geography, economic geography, urban planning, history, and sociology. The resulting classification table is then populated by examples of papers about city growth from these disciplines. Furthermore, in accordance with the logical thinking of the disciplines, causal loop diagrams are developed which are used to identify the causal relationships between events, thus helping to create narratives of city growth.

The thesis uses the methodological insights gained from this classification in a case study of the Indonesian city of Purwokerto, which is classed as a ‘second city’ in Indonesia’s hierarchy and which receives less academic attention than the main cities of the country. Using historical data from various sources, past narratives of Purwokerto’s growth are created following logical thinking from four disciplines: transport studies, economics, geography, and sociology. A similar procedure is then used to create narratives of the future, though based around the trajectories foreseen and planned in official development plans instead of historical.

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Chapter 1
Growth of the Cities and Sustainable Development

1.1. Growth of the cities

The city is an entity that continuously changes over time and involves many elements, both physical and non-physical. It becomes a centre of development as this place gives chances for economic and social development. For many people, these development variables are usually considered as two important elements that have a positive impact on the growth of cities (Glaeser et al., 1995). Growth of cities is moreover related to a changes process in both physical and non-physical elements. People moving from one place to another following industrialisation and job opportunities brings about physical changes in the city that in turn lead to city expansion (Burgess, 2011). City expansion as a result of an increasing number of activities and population manifests in the transformation of land use and transportation with respect to an evolutionary perspective as well as city character. Hence economic and social development might be considered as non-physical elements.

Cities across the world have different experiences of their growth, especially since dynamic processes shape how they are formed. The rapid growth of the city also leads to major issues in sustainable development (SD), e.g. unbalanced growth, reduced wealth, ecological impact, etc (United Nations, 2013). Sustainable development, which is defined as a development paradigm that considers the ability of future generations to meet their needs as they are met at present, is a complex and multidimensional issue (Ciegis et al. in Deng et al., 2011). Shao, Li and Tang moreover explain the SD general concept is considered from three fundamental approaches, i.e. economic, environmental and social development. From this point of view, therefore, the different disciplines have a different concept for determining SD. Thus it is good to understand SD in city development from multidisciplinary viewpoints. This sustainable development issue will be further discussed in section 2.7.

The dynamic processed in city growth (which will be explained in detail in the next

chapter in section 2.1.) are mostly created by land use and transportation development. Bhatta (2010a) explains this process, as shown in Figure 1.1., through three different categories of growth: (1) infill, (2) expansion, and (3) outlying. The in-fill process is depicted by converting a blank undeveloped pixel with urban use. Secondly, expansion is characterised by an expansion of the existing developed pixel to the undeveloped ones. Moreover, outlying growth is expressed by converting the undeveloped area into a developed area beyond the existing developed area location. Hence, the newly developed area has a distance from earlier urban use. Further explanation regarding the growth process will be presented in chapter two (section 2.2).

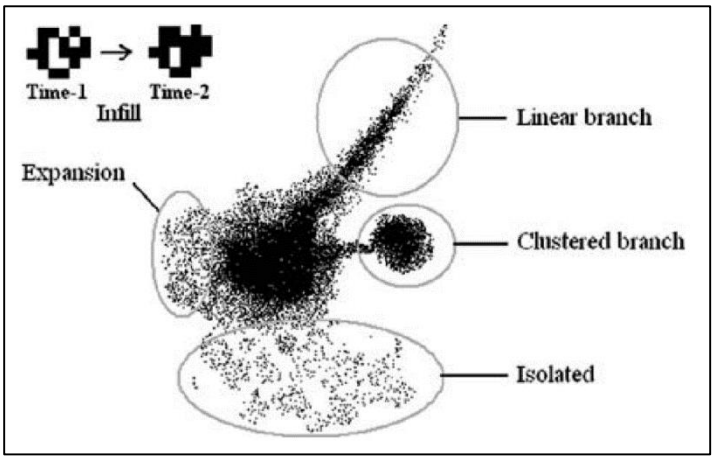


Figure 1.1 Growth process (Bhatta, 2010b)

Taken from Harris (1997) discussion, there are different key drivers in defining the growth of the city regarding land use and transport development. It also describes how transportation and land use pattern is formed. *Firstly* land use and its settlement characteristic correlate with the country characteristics such as where the cities are located. The location of cities also points to developed or developing country's characteristics. In this respect, social attitudes and public policies play essential roles in city pattern formation. These social attitudes and public policies are expressed in the landscape pattern. From Harris' observation in general, American cities have a racial discrimination effect on landscape formation, while Eastern European cities have mixed social groups of housing and have discarded this concentration or segregation. Meanwhile cities in the developing world have been overwhelmed by rural-urban migration and squatter area in-between. In this respect, most scholars agree that Southeast Asian cities are the most appropriate place to be observed, as they experience complex processes in their growth (McGee and Robinson, 1995; Dick and Rimmer, 1998; Rimmer and Dick, 2009; Emmerson et al., 2014). The characteristics

of Southeast Asian cities are formed by a combination of historical process and globalisation effect.

Second is a culture that relates to how people respond to the development effects, changes, and modernism. Regarding this issue Goh and Bunnell (2013) state that Southeast Asian cities are empirical evidence for the cities development theories due to their contact with Western civilisation and Asian culture. These Southeast Asia leading cities are cities where urbanisation at first can be easily found. This has consequently drawn a number of scholars to these cities. Moreover, in recent time decentralisation has arisen widely in Southeast Asia and has made this region more interesting to observe. This conditions have made the paradigm of the third world that has been applied to Southeast Asian cities has become obsolete since the 1980s as massive development has occurred in this region since around that time. This development was then generated by a huge sum capital, industrial, increasing the middle class in some Southeast Asian leading cities that is led by globalisation phenomenon (Dick and Rimmer, 1998; Atkinson, 2010)

The third is government political will. Government policies drive development in their countries. Concerning the Southeast Asian countries, Miller, Michelle Ann and Bunnell (2012) and Atkinson (2010) mention that decentralisation policy has arisen in the early 21st century and has been pushed forward by the presence of international development community donors and agencies to community empowerment. The community empowerment program is addressed to local governments in encouraging community role in city development. In this regards, local resources are pushed to be identified as development assets. Therefore, local development is driven by bottom-up process since it is based on local potencies.

The growth of the city is an on-going process. Hommels (2005 p. 323) argues that cities are in the process of being built and rebuilt over time. Even though they are being continuously built, cities are historically obdurate. Thereby, there will be some element's continuity in the growth of the cities' process that may likely occur in most of the city growth.

However, Kenworthy (2006) found that the changes as a representation of the growth of the city can potentially lead to the unsustainable form and process of a city. This refers to the environmental and ecological problems associated with the rapid growth of a city in terms of industrialisation and population growth. Growing numbers of

industries, as a result of economic development policy in creating economic triggers, mostly affect environmental issues such as land use and air quality. Concerning land use, the needs for widening industrial area results in land exploitation that for some reasons ignores the land's carrying capacity. Taking over land from buffer zones to expand the settlement area is a significant example in this regard. For the reason of excellent view and also limited land availability, these occupations usually result in changing the land function for different purposes. Moreover spreading of industries' location resulting in city area expansion triggers people moving from one to another, eventually resulting in the massive use of fossil fuel. On the other side, as people prefer to live in cities, cities become an important place where social processes occur. Barredo and Demicheli (2003) express that social processes have an enormous impact on the environment in different scales. The occurrences of the environment and ecological problems that lead to city problems are basically caused by unbalanced conditions. Furthermore, these conditions might break the link between the current and future condition of the city. People in the future would hardly get the benefits earned by the present people. This, in turn, leads to sustainable development concepts that will be explained later in chapter two.

Clearly, as the growth of cities covers a great number of aspects, it should be understood from different points of view. In this regard, there are some authors whose work can be utilised to address this issue and which will later be explained in point 1.2. Currently, most papers discuss the concerned field by engaging their perspectives that basically refer to a single disciplinary approach whilst a small number of papers provide a discourse of city growth using a multidisciplinary approach with academic viewpoint. These later works motivate the present thesis.

Therefore this thesis helps to resolve the problem arising from city growth by giving a new understanding of city planning. Based on the sustainability paradigm, the solution should consider the impact of city development across a number of sustainability elements covering social equity, accessibility, ecology, economic performance, pollution and health (Williams, 2017). Considering the sustainable development paradigm, this thesis attempts to give an understanding to the different perspective of city growth that in turn might consider city authorities in how they establish development policies. Through city planning, an authority may willingly set a better condition to create a better life for the citizens.

Moreover, as a current city's form resulted from its development from the past, this thesis also attempts to improve an understanding of future-city growth processes by considering the past development. This complex issue can be easily understood using a causal relationship pattern amongst variables. The past pattern, in this regard, is assumed to appear in the future.

This thesis utilises a narrative approach in order to demonstrate the causality amongst variables as there are varied variables involved in the city growth process. Here, a narrative approach is used in creating both the past and future growth of the city. The narrative approach is a tool to help to produce a full story of city development. This is because following the narrative approach will lead to the creating of a detailed story that connects events chronologically (Czamiawska in Creswell, 2002). Hence, a narrative will be developed by giving account of events toward analysing and understanding as there is a perception in interpreting the condition.

1.2. Multidisciplinary perspectives and interdisciplinary perspectives in the growth of the cities

1.2.1. Multidisciplinary perspectives

Multidisciplinary perspectives are related to the knowledge and activities embodied in the various disciplines. Therefore multidisciplinarity needs to be associated with many established disciplines. This association does not mean a mixing up between disciplines, rather they still stay within their discipline boundaries (Alvargonzalez, 2011 p. 388). Here, using a multidisciplinarity approach means an incorporated, varied perspective in a collaborative project from different disciplines (Zaman and Goschin, 2010; Alvargonzalez, 2011). The result of a multidisciplinary approach will take into account the meaningful aggregations of many disciplines with each still standing on each respective discipline perspective. This usually ends up with an accumulation of a more complex image of realities.

As mentioned in the previous sub-section, some authors are concerned with different perspectives with respect to the growth of the city. One of these, Glaeser et al (1992) present a discussion of the growth of the city's issue from several perspectives e.g. history, economy, geography, and sociology. In explaining the growth of the city, Glaeser et al identify the different points of view considering the city growth topic.

Historians nicely put events in sequence and consider the causative relationship among those events to express the growth of the city process. Economists generally see the growth of the city as a result of economic growth that generates development in different aspects. In geography's perspective, city growth is seen as a process of spatial relationships that basically have three keys: space, place, and scale. In turn, economic geographers merge economic and geography point of view. The growth of the city in economic geography's view is seen from the emergence and impact of economic activities that are considered from a spatial perspective. Sociologists on the other hand, consider the interaction between people that built communities. The discussions are mostly conducted in accordance with their disciplinary background. As a consequence of these analyses and predictions, some factors that are not concerned with specific disciplines are then neglected. As those different perspectives look at and view different things in the growth of the city, some important aspects in the growth of the city process might be missed out.

A comprehensive discussion about the city has also undertaken by Beall et al (2009). Here, the arguments is that complex and multidimensional processes happens in a city. Therefore a discourse of city development will address views across disciplines to make it complete and adequate. Different disciplinary perspectives including economy, sociology, anthropology, politic, and geography are addressed to contribute to a debate of city development. Urbanisation is put as the centre of discussion. Urbanisation refers to the fact that urban centre geographically offers a position privilege that creates people movements from other locations. Cities also provide opportunities for economic activities in many scales regarding public investment and enterprises. This might appear as a city fills with various infrastructure provision as well as human capital. In term of the sociologist point of view, the city is a pot where cultural interchange takes place and drives social change. Moreover, this condition leads to the start of innovation. However, alongside this dynamic process happen and a city is also pointed to as a locus of different issues regarding social differentiation and degradation of the environment.

Wilson (1998) discusses the growth of the city as land use/transport interaction. As it reflects of urban development, the land use/transport interaction obviously involve different disciplines. The multidisciplinary perspectives are interpreted by a different model with various terms, following different discipline points of view. By economists' view, land use/transport interaction is drawn as to the determination of

transport behaviour that is strained by consumers' behaviour theories. Meanwhile, geographers concern with spatial interaction that is modelled by integrating settled geography's theories, e.g. Von Thunen's agricultural land use theory, Christaller's settlement theory, Zipf's gravitational theory, and Haggett's geographical synthesis theory. Sociologists, on the other hand, contribute statistical models to express urban evolution. In a nutshell, Wilson expresses the different points of view that drive different models to simplify how the cities grow.

The different disciplinary perspectives in discussing the growth of the cities are addressed in those paper examples. Presenting the growth of the city in multidisciplinary perspectives is shown by varied points of view in seeing growth of the city process. Here, this multidisciplinary approach might lead to a wider understanding of city growth including its complicated development process.

The key question that remains from the discussion of city growth from different points of view is what the generic methodology that can be applied in cities across the world. This is because cities across the globe have growth process experiences.

1.2.2. Single disciplinarity and interdisciplinarity perspectives

Interdisciplinarity refers to an activity that presents among existing disciplines or in a reciprocal relationship between them. The interdisciplinarity appears from a combining and integrating process of different disciplines with their different methodologies and assumptions. The process then results in crossing disciplinary boundaries and mixing their techniques. However, using the interdisciplinarity approach does not mean ignoring each discipline authority as Klein (1990). Like in an international relationship between different countries does not imply denying the sovereignty of each, interdisciplinarity would not negate the independence of each discipline. Therefore in undertaking interdisciplinarity analyses, disciplines are synthesised and harmonised linking between disciplines into a coordinated and coherent whole.

Simply put Zaman and Goschin (2010) conclude that:

> Methodologies and assumptions belonging to different disciplines are connected and modified to adapt to the needs of the research, creating new tools which allow for the investigation of difficult subjects that surpass the possibilities of a single discipline.

Hence, interdisciplinarity differs with multidisciplinary regarding the relationship between disciplines that there is a borrowing of theories, concepts, or methodologies making the interdisciplinary approach an interactive relationship. On the other side, as there is a collective process in the multidisciplinarity approach, this refers to the collective and mutual relationship between different disciplines. The interactive relationship between different disciplines drives toward a new method of integrative research.

Some disciplines, however, reflect an interdisciplinary perspective themselves such as economic geography, urban planning, and transport studies. There is a big difference between economy and geography as a single discipline's perspective and economic geography as an interdisciplinary regarding city growth as explained at the beginning of this subsection. This also obviously appears in urban planning and transport studies' perspectives.

In discussing the growth of cities and regions from an economic geography perspective, Storper (2011) uses urbanisation to explain spatial agglomeration of economic activities, including industries. This addresses economic activities that choose particular places for their activities. Furthermore, it defines a dynamic process of economic activities including how firms' agglomeration obviously reduces production cost, will likely increase wages in turn. This phenomenon is one of many factors that attract people to move to urban area where the agglomeration appear. Therefore economic geography describes the geographical development process of agglomeration.

Meanwhile, the economists' perspective of growth is broadly triggered by economic growth that is represented by capital flow. Whilst geographers roughly consider where the economic activities spatially appear. Geographers are also concern with the spatial process of agglomeration that affects rural exodus phenomena. Here, geographers consider substitution of labour and capital across a location that economy does not.

On the other side, according to Pinson's term, urban planning is an undisciplined discipline for it is not autonomous but it tends to be an interdisciplinarity (Pinson, 2004). Further, Pinson expresses that urban planning constructs its own identity as a hybrid of some disciplines such as geography, sociology, economy, and engineering. Meanwhile, transport studies is an interdiscipline as it incorporates many skills of engineers, economists, urban planners, econometric personnel and creates a hybrid

interdiscipline namely transport studies (Maurer, 2010).

Figure 1.1. represents an explanation for the construction of a multidisciplinary approach by comparing interdisciplinary approaches of the opponent side.

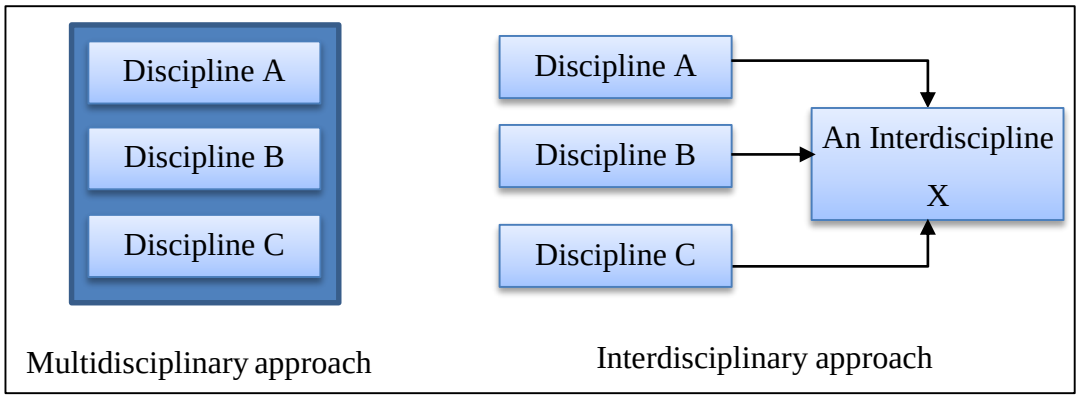


Figure 1.1. An illustration of a multidisciplinary and interdisciplinary approach

Considering those three disciplinary approaches, i.e. single disciplinary, multidisciplinary, and interdisciplinary, this research brings out a multidisciplinary approach incorporating both disciplines and interdisciplines. The interdisciplines as mentioned in the previous paragraphs are represented by economic geography, urban planning, and transport studies. However, these three interdisciplines are treated as disciplines in order to present a multidisciplinary approach. Thus, there will be varied perspectives that will keep their unique point of views to construct logical thinking regarding the growth of the city.

1.3. Aim and objectives

Putting city growth in the context of sustainable development as a starting point of this study, the research questions of this thesis are constructed as follows:

1. “How are a variety of city growth stories in the past and future conditions created from different disciplinary perspectives using a multidisciplinary approach systematically and logically?”
2. “How is the future-city development story incorporating the past evidence created”

Following the research questions, this research aims to develop a methodology to create city growth narratives from different disciplinary perspectives. The methodology is expected to help the understanding of the growth of the city from varied different perspectives, which includes the past development of the city from

different perspectives and also the possible future growth of the city.

Some hypotheses follow these research questions:

- As cities have the element of continuity in their growth process there is likely the same causal relationship diagram for both the past and future conditions
- As different disciplines have different points of view, those different points of view may play a vital role in the way a narrative should be built.

Furthermore, as a discourse of city growth refers to both theoretical and real-world occurrences some questions associated with the above mentioned aims above are:

- How can one to develop a methodology that can cover the theoretical and subject matters of an understanding of the city growth process?
- How can one set a number of steps as a part of the approach to creating a kind of narrative growth of the cities?

In order to pursue the aim of this research, there are a number of objectives as follows:

1. Construct a classification framework to accommodate the different perspectives amongst disciplines in discussing the growth of the city
2. Populated the classification framework with paper examples to map the different perspectives
3. Develop historical narratives of the city using the methodological approach from different disciplinary perspectives. These narratives are developed considering events in a particular city. Some different narratives show different perspectives from many disciplines
4. Develop future narratives of the city. The future condition could likely be determined as it happened in the past. Some alternative scenarios based on different disciplinary perspective are created as visioning options for the growth of the city.

This thesis is an explanatory tool for academics regarding city development concerning land use and transport changes. It will deliver a discussion on the different points of view in understanding the growth of the city. It also might ultimately be used by others as a practical tool for better city planning and suggestions.

In achieving the objectives mentioned previously, there are some challenges which will potentially be encountered in this research, such as:

- How to determine the disciplines to be considered in constructing the

multidisciplinary approach for understanding the growth of the city process?

- How to treat interdisciplines regarding the first objective?
- How to determine the pieces of literature which need to be addressed in order to populate the classification table and group them into different perspectives?
- How to populate the classification framework with related literature examples to map the different perspectives?
- How to determine the events to be referred to as the evidence of the historical development of the case study city and the sequence of those events regarding their time appearance?
- How to determine the causal relationships amongst events which appeared time by time in the case study of city historical development and the relationships by considering different disciplinary perspectives?
- How to define which information, including city plans and related-possible future of the case study city, needs to be concerned as the intended future of the city and determine the information for future events?
- How to deal with the different interpretations of the future of the city as mentioned by varied documents?

1.4. Thesis overview

The remaining texts of this thesis present explanations of the methodology mentioned in the previous section and its application in the real case study city. It consists of – excluding chapter one, nine chapters as presented below:

Chapter two presents a literature review including the meaning of the cities, city growth process for a number of views, related variables in growth of the city process.

Chapter three presents a research methodology discussing the method to be developed. This chapter broadly contains two-part: (1) the methodology used in this thesis, and (2) methodology broadly contains three parts: generic concept, development of the past narratives, and development of the future narratives.

The first part provides a concept that can be applied in any city. The generic part refers to different perspectives on the growth of the city that has already been established. The generic part also presents some possible sets of combination criteria in the growth of the city within a discipline.

Using evidence of the case study, some steps are done to determine the relevant set of criteria of discipline. In this regards, the role of evidence is explained as an important component of the method. It is because evidence defines the form of theoretical perspective used in the rest segment of the method. Furthermore, the evidence is seen to draw the interaction between related variables in the growth of the city.

Narratives of the future city are created considering the development of past narratives city section. From the past segment, one can record the possible occurring event like an impact of the causal variable. The future narratives are supported by related document about projection, prediction, and thoughts of the future. However, development and growth of perspective are also considered in creating the narratives.

Chapter four aims to create framework criteria to understand the growth of the city by classifying different disciplinary perspectives. It covers an analytical review which stands beyond the perspectives of varied disciplinary perspectives. In an attempt to achieve the research aims, several steps need to be followed:

(1) Identifying general views from different disciplinary perspectives,

In order to achieve a comprehensive review of city growth theories, this course takes into account some established city growth theories from previously mentioned discipline. It is then exacerbated with numerous related journal articles.

The general views of each discipline are then highlighted in order to understand the interdisciplinary perspectives of city growth theories. They are each concern with how the discipline may determine the considered factors of city growth, the emergence of interaction between factors, the relationship patterns between factors and the forward's trend of interaction between factors.

(2) Determining distinguishing factors that are considered under concerned disciplines,

Although various disciplines may deal with the same topic -the growth of the city- they do not share the same view on it. Considering theoretical reviews from varied disciplinary perspectives, this step determines the considered factors of each discipline in city growth theory.

The considered factors generate differences between the principles of the concerned disciplines. Furthermore, this section is a step towards the denotation of the considered factors of each discipline. These are identified by retrieving views from

varied disciplines.

(3) Propose a classification table

This section presents a proposed table to be filled with some features of different views of city growth theories from numerous scholars.

Chapter five populates the classification table created in the previous chapter. An in-depth analysis led by nine proposed criteria will be undertaken in this chapter. This is related to applied theories which are implemented by numerous scholars. An analytical review came from numerous scholars leading to a combination of concentration features with respect to each discipline perspective. A map of perspectives is created to represent the combination sub-criteria concerned by each paper example in each classification table. It then broadly consists of three steps:

(1) Creating a table of considered criteria

In this step, a table is created to understand different perspectives in seeing the growth of cities within a particular discipline. Numbers of criteria are used to support the classification. Since this research is concerned with a theoretical view and empirical condition. Therefore the criteria are distinguished into two parts: discipline views and subject matter. Furthermore, each criterion is broken down into sub-criteria. Therefore on the table, there will be a cell which can be populated relevantly with the discussion of the particular paper. However, a cell could be blank when a scholar does not refer to one feature of the factors considered.

(2) Determining a common combination of considered criteria of each discipline

Dealing with some considered criteria developed in the previous steps, this step attempts to identify the combinations of commonly considered factors in each disciplinary perspective regarding city growth theory. This is obtained by reviewing numerous journal articles under previously set up factors which must be taken into consideration.

Regarding the considered-factors table, there are several criteria combination that can be generated for each discipline. Therefore, one combination is chosen considering the most revealed combination in each discipline to determine a perspective framework of city growth theory.

(3) Building a generic combination of the considered factors beyond the disciplinary perspectives.

Chapter six introduces the case study city including its position in this thesis. This chapter also presents a broad description of the case study city used in this thesis. General information about the case study city is delivered in accordance with

population, geographical condition, economic, and social characteristics of the city. This chapter presents the different data sources and data classification. Collection and identification all of the events that are considered as historical factual evidence, appear in the city growth process.

Concerning data availability, two steps are to be completed. The first is collecting related data and information. This step covers the collection of related data and information. It describes the past and present situations of an Indonesian city by highlighting the influence of various factors in its development. The factors of interest are: natural, cultural and policy-related. An important aspect of this evolution is that Indonesia had a long period (more than three centuries) under colonialism. The pieces of evidence are taken from several periods that are broadly separated into particular periods. These periods have distinctive patterns in their city development process: pre-colonial, colonial and independence.

Historical documents, government documents, ancient maps and statistical data are sought in several ways. They are taken from the Indonesian government archives, museum collections, and related publications.

The second one is collating the pieces of information in sequences. This step is a part of the research that is conducted over a long-term period of city evolution. It observes developmental progress through events that appear over time. A long-term city development history is a transcription of how a city evolves since it was formed. It also includes the dynamic changes experience. By determining events in a sequential order, it may facilitate and identify whether events occur in the same period or not (Morris et al., 2003).

Chapter seven creates past narratives of historical past evidence which are explored in Chapter Six. Chapter Seven is concerned with building some different causal loop diagrams from different disciplinary perspectives that will be followed in creating both past narratives and future narratives.

Chapter eight summaries some future documents related to the growth of an Indonesian city. The future documents are with respect to policies, planning, works, projection, forecast, and research for the future. Some different scale area-local, regional and national, are referred to.

Chapter nine describes creating future city narratives. The same procedure in creating past narratives presented in Chapter Six will be done in this chapter. In creating a future narrative, documents related to the future are used as future evidence. Furthermore, the future narrative of the city will follow logical thinking from different

disciplinary perspectives. Accordingly, those pieces of future evidence would be compiled regarding the causal relationship from a causal loop diagram built in Chapter Seven.

Chapter ten concludes the thesis. Future research that can be undertaken is also presented in this chapter.

Chapter 2
City growth: Meaning and Development

2.1. Introduction

The precise meaning of a city is an interesting discussion in understanding city existence. This is because most activities currently occur in cities. This condition then leads to migration to the city and urbanisation in cities across the globe. The rapid growth of the city population through places, expansion of built-up area and urbanisation in all over the spaces are usually marked by urban activities.

On the other hand, city development also creates some negative issues that might drive environmental deterioration, social problems, and unsatisfactory infrastructure provision. In accordance with the growth of the city, Cohen (2004) argues that city planning, particularly in developing countries, usually deals with economic growth. According to Cohen, the development of the city is conducted to enhance economic performance. Therefore city development aspects are associated with the purpose of increasing economic sectors. Economic growth is needed for reducing poverty and increasing per capita income. City authorities attempt to accelerate the growth of all factors by developing toward the intended future condition. As this is based around the economic purposes, economic objectives (e.g. per capita income, the growth of economic activities, economic revenue, etc.) become important in defining government policies. In fact growth of the city is not merely about city economics but also need to be concerned with other aspects. A focus on economic factors often brings about unsustainable development.

In order to completely understand what happens in a city in term of its growth, this chapter presents a discussion of the meaning of cities, their development, and the development impact.

2.2. Development of city meaning

The city is not only a collection of tangible elements but also social exchanges of different aspects such as economic, geographic, cultural etc. (Massey John; Pile, Steve, 1999). Hence, a city can be defined as a system of those mentioned elements that relate one another to achieve a comprehensive system of the city. Therefore, simple changes in an element will influence the entire city system. In other words, the city changes dynamically.

The dynamic city changes closely related to growth of the city. In this regard, changes cover both physical and non-physical elements. Physical changes in the city usually refer to city expansion brought about by people moving from one place to another in accordance with industrialisation and job opportunities. This changes is an indication of growth of the city (Burgess, 2011). City expansion as a result of an increasing number of activities and population is manifested on the transformation of land use and transportation with respect to the evolutionary perspective as well as city character.

How a city grows has been discussed by many researchers across the globe for a long time. Here, the definition of the city becomes essential to understand the growth of the city, depict what exactly a city is. The precise meaning of a city is an interesting discussion in the understanding of a city's existence. Wirth in Brenner (2013) present basic criteria in determining a city: population size, population density and level of demographic heterogeneity. Following this, Champion et al. (2004) add further criteria to define what a city is. The parameters are population size, population density, continuity of built-up area, political status, the proportion of labour force engaged in non-agricultural work and presence of particular services or activities. Research done by Parr (2007), indicates that cities are distinguished to four types: the built city, the consumption city, the employment city and the workforce city. The built city refers to a city distinguished by its urban function. With respect to the cities function, urban is defined by the appearances of city elements. The emergence of the city can be indicated by the occurrences of city development and the development effects. The remaining criteria for a city definition are basically constructed from understanding the built city concepts. The definition of a consumption city is derived from its consumption activities. Consumption refers to the consumption of household goods including personal services. A city is defined as a consumption city when its

consumption of goods is not confined to the built city. Some outer-areas also supply the consumption needs which then generates commuting travel from the built city to outer area. The employment city and workplace city refer to the demand-supply interaction between places. Employment city is a place that looks to build a city for labour supply whilst a workplace city emerges when a built city needs labour from outer areas. The workplace city is determined by the emergence of separate localities away from city centres. Both of these locations are considered to be at an efficient distance from built city.

Definition and city criteria mentioned in the previous paragraphs define the term 'city' in term of its function. This does not always agree with the recent understanding of the term 'city' which includes regions beyond its administrative boundary. This is because in recent times cities have become boundless. Conurbation areas have appeared as continuum area in-between city centres and countryside or rural areas. In this regards, the classical criteria for determination of a city have slowly become obsolete and have been succeeded by a boundless, discreet and distinctive territory as stated by Brenner (2013). Moreover, city footprints can be found not only in big cities but also in places that were previously called rural. These footprints include information technologies, built-up areas and social communities.

In transport policy, predict and provide refers to the projection of demands that considers the needs, meets with the infrastructure provision (Owens, 1995). Therefore, urban development, when the city becomes bigger and connects to other nearest neighbours, as mentioned in the above paragraph relates to the demands of movement from one to other places. Here, in projecting the future needs in transport, the 'predict' term is carried out to get the trajectory of the demand. In this regard, the bigger the urban area the more car trips. The philosophy of 'provide' then drives for providing enough road and other supporting transport infrastructures. However, it will not bear the sustainable development issue as car domination correlates with environmental issues. Here, even though the city future-needs can be nicely prepared regarding the trajectories but considering the future city development policies only on the projection will create a problem in sustaining the environment.

From the city definitions widely explained above, a historical understanding of the mutual effects of land use and transport development in cities, made through empirical observation, can help solve present-day transport problems. In particular, an

understanding of significant changes in the past can help gain insights into how radical changes may be brought about in the future. Such empirical observations are concerned with: how land use planning decisions affect the transport requirement of the city; how capacity provision for alternative modes across different parts of a city may affect traveller behaviour; how traveller behaviour influences the policy to provide transport infrastructure, and how transport infrastructure, in turn, may affect land-use decisions taken by governments. However, given that cities have evolved differently to each other in response to varying factors, an understanding of the mutual effects of land use and transport development needs to take into account diversity between cities.

2.3. Land use and transport development overtime

Growth of the city is closely related to the city-forming process. Basically, cities are formed around a centre of activities and the transport network. It can be illustrated as there are a number of activity centres which represent the majority of activity for specific land use that is connected to one another by transport networks. The growth of each city function leads to city structure for their road system and city system. City system is shown by the centre of activities that spread over the city area and connect to another by transport infrastructure. In this regard, the growth of the city could be defined as the physical development of the city area. Increasing population and built-up area push the early city centre out.

Furthermore, growth of the city can be characterised into two types; compact and sprawl growth (Bhatta, 2010c). Compact growth refers to the increasing role of the city as population and activities are concentrated in a well-planned city. Compact growth refers to a localised growth in a particular area. It is usually in the centre of the city. Many researchers claim that compact growth is in accordance with monocentric growth which closely relates to single centre activity in urban development. The compact growth city is achieved by discouraging an outgrowth and intent to be a highly-compacted size. On the other hand, sprawled growth refers to un-designed city growth and an uneven growth pattern. Sprawled growth is sometimes used to express negative connotations of city growth impact since it points to unplanned growth across urban areas.

Following the city growth definition mentioned previously, growth of the city is

usually connected with sprawled growth since it accommodates expanding and widening city area. Borrowing from Bhatta's classification, it could be explained through the cause of city growth type presented in Table 2.1.

Causes of urban growth	Compact growth	Sprawled growth
Population growth	•	•
Independence of decision		•
Economic growth	•	•
Industrialisation	•	•
Speculation		•
Expectations of land appreciation		•
Land hunger attitude		•
Legal disputes		•
Physical geography		•
Development and property tax		•
Living and property cost		•
Lack of affordable housing		•
Demand of more living space	•	•
Public regulation		•
Transportation	•	•
Road width		•
Single-family home		•
Nucleus family	•	•
Credit and capital market		•
Government developmental policies		•
Lack of proper planning policies		•
Failure to enforce planning policies		•
Country-living desire		•
Housing investment		•
Large lot size		•

Figure 2.1 Causes that would affect growth of the city (source: Bhatta, 2010a)

There are 25 causes that induce and also catalyse the growth of the cities. Those 25 causes generate sprawled growth that is connected to city growth. Population growth is generated by natural population growth and in-migration. The huge growth of population in the city will then cause uncontrolled growth since people need to fulfil house provision. For this reason, people sporadically find affordable houses beyond the earlier city area. Other causes of sprawled growth relate to desire, policies, and social value that induce people to move or live beyond primary city areas. Hence, the chosen area includes some comfort and accessible area. Despite the previously mentioned causes of sprawled growth, there is also increasing economic and technological development that gives opportunities for people to have a distance from the primary city centre.

2.4. Land property as one of the principal problems faced by developing countries

City growth is related to both physical and non-physical development. Regarding physical development, the growth of city development relates to infrastructure development that in some cases need land for the construction site (Durand-Lasserve and Royston, 2002). However, the land belongs to either state or is owned privately. Therefore, in a number of development cases, there are also land taking over circumstances to conduct the physical development regarding infrastructure developments. It is then a necessity to have legal certainty over land ownerships in order to control and manage land use. Managing and controlling land ownership guarantees legal certainty in the land sector relating to construction, especially those that are in the public interest. This is because infrastructure can be run where the construction site is located and is legally controlled by building owners, both public and private.

In Indonesia, the land tenure system is developed as a reflection of a mixed law system between colonialist (Dutch) and the local law (Supriatna, 2016). Using research data from a study in Medan, North Sumatera, in Indonesian cities about 30% of the infrastructure development fund is consumed by the facilitation of the land take over from private land ownership. Hence, only 70% of the fund can be used to build infrastructure (Haris, 2009). On the other hand, land ownership in Indonesia is regulated and protected by Agrarian Law 1960. In this special law, the land ownership is assured as an authorisation granted by the government to a person or legal entity to use land within the limit under the provision law (Sekretariat Negara Republik Indonesia, 1960).

As stated in the above paragraphs, land tenure is related to urban development. This refers to the legal right of property belonging to citizens that need to be considered in developing an area and using land in order to provide or develop activities area. Hence, land tenure might be important in the growth of the city field. However, this thesis does not concentrate on land tenure, though it would be great to discuss this issue for further research.

This issue might be important in the city growth field, and this research henceforth considers property rights in city development. However, this thesis does not put much

emphasis on property rights. This theme could be more of a focus for further research.

2.5. An understanding of land use – transport development

Transport – land use interaction is highly complex. It always changes over time, space and technology. This interaction is not limited only to dynamic relations between land use and transport, but also to the affected variables such as policy, the population etc. The interplay of each affecting variable and main variable - land use and transport - is the most complex causality interaction.

The relation between transport and land use is very important in spatial development term since its patterns construct the urban structure. Chang (2006), Webster (2007) and Wegener (2004) described in their article that there were two types of this relationship: the effect of land use on transportation and the effect of transportation on land use.

2.6. Long term future perspective and its favour over development

The growth of the cities as previously mentioned has resulted in some positive and negative impacts. Besides generating growth development in several aspects such as communication, technology, trading, and quality of life etc., city growth also affects the emergence of urban problems. These urban problems emerge along with the rapid growth of cities such as transportation problem, disposal, air pollution, energy supply (Arriaga, 1968). With regard to city problems, there are several approaches to overcome these, whether it be in the short or long term.

A long term city history development is a transcription of city evolution. It is formed by huge pieces of evidence. In the same context, long term for the future city condition is expected to cover detailed information of development that might arise.

2.7. Sustainable development

Sustainable development could point to the longer-term thinking of environmental issues in conducting city development. Sustainable development in this regard encompasses to all aspects of human life development that gives sustenance (Bhatta, 2010a). Moreover, United Nations World Commission on Environment and Development (WCED) broadly defines a sustainable development concept as a

development that meets the needs of the present generation as well as that of the future generations (Berke and Conroy, 2007). Hence, the future generation is assumed to receive a good standard of life as is received by present people within a natural system limit. Therefore even though the city development process is closely related to economic growth acceleration and generated social change, it should also consider environmental sustainability. However, sustainable development doesn't merely put emphasis on the environment but also focuses on other issues i.e. economic and social. Sustainable development of the city, therefore meets economic development, social development, and environmental protection (United Nations 2005 in Bhatta, 2010c).

As people prefer to live in cities, cities become an important place where social processes occur. In turn, social processes have an enormous impact on the environment on different scales (Barredo and Demicheli, 2003). In this regard, Barredo and Demicheli (2003 p. 297) argue that urban development sustainability is such of equilibrium balancing in different city development factors, i.e. economic activity, population growth, infrastructure and services, pollution, waste, noise etc. This argument is in line with the unbalanced conditions mentioned in the previous chapter resulting from the development concerned with the growth of particular aspects.

The past experiences in the growth of the city show that environment and ecological problems associate themselves with the rapid growth of the city both in terms of industrialisation and population growth (Berke and Conroy, 2007). Growing numbers of industries, as a result of economic development policy in creating economic triggers, mostly affect environmental issues such as land use and air quality. With regard to land use, the needs for widening industrial area results in land exploitation and that for some reason ignores the land's carrying capacity. Taking over land from buffer zones in order to expand a settlement area is a significant example in this regard. For the reason of excellent view and also limited land availability, these occupations usually result in changing the land function into different things. Moreover spreading of industries' location resulting in city area expansion triggers the movement of people from one place to another, this eventually results in the massive use of fossil fuel.

The principal problem faced by city authorities in a number of cities within developing countries is how to control the spread of built-up areas whilst considering the growth

of activities. Therefore, city planning in this regard needs to be adjusted to people's needs. Hence, even though a city planning document covers future forecasting for activities and growth of population, it sometimes needs to go beyond the conventional calculation and take into accordance the dynamic growth of developing countries.

2.8. System thinking and consensus building

This thesis as mentioned in chapter one, concern on growth of the city that basically considers a complicated process within its development. Here, Smith and Thelen (2003) describe development as a process to create something more from something less. This means development is indicated by changes within its complicated process. In essence, there is a dynamic process in development. City development, therefore, depicts a complex process especially as various factors that take place in its process.

This section will be explaining both system thinking and consensus-building that basically have a close relation with city development complexity. Systems thinking is used as a principled approach to understanding the complicated world and on the other hand, there is a consensus-building that shows how to make an agreement above different opinions and perspectives. This thesis is not going to concern with how to do the consensus building, but it adopts the consensus-building process in the application of the outcome of this thesis. CLD in this thesis, explained in another part of this chapter, is used to help people understand the different disciplinary perspectives in how city develops over time.

2.8.1. Systems thinking

System thinking is known as a fundamental concept that involves systemic and holistic thinking. The holistic matter is explained by Senge (2010) who describes systems thinking as an approach that sees everything as a web of systems. Therefore within a big system, there are numerous systems work together in an interdependence way. Here, this concept is laid on how to logically understand connections and relationship between things (Haraldsson, 2004). As systems thinking comprehensively see a complicated thing as a system, therefore system thinking approach can be engaged with a particularly complicated process (Lich et al., 2017) like city development. The way system thinking short out a dynamic and complicated

system is from where a system thinking enables to analyse cause and effect in a variable-relationship that then can be used to explain how the changes come about. This changes, however, is a common indicator of a dynamic process. It is understood that system thinking is defined as a basic concept to understand causal relationships between different variables in everyday life (Haraldsson, 2004). Thus, in system thinking is also recognised how feedback plays a role in causal relationships.

System thinking, moreover, embeds system analysis and system dynamic. The last two concepts are practical applications of system thinking as through causal loop diagram (CLD), the relationship between factors can be linked following cause-effect pattern.

2.8.2. Consensus building

Consensus building is a problem-solving approach. Through a consensus, some decisions can be built by a group of people who jointly develop the agreements (Susskind, 1996). Consensus building can be interpreted as a coordination technique that facilitates a discussion to produce decisions that consider different perspectives (Innes, 1996). Doing a consensus-building, different groups with a different points of view can together develop agreements that can satisfy everyone's main concern. This is because consensus-building approach forges people to firstly understand other people points of view and discuss them to decide whatever policies are suitable for the community (Susskind, 1999). Through a consensus-building, a consensus is developed over complex matters. In Innes, the way to understand each perspective is done by doing in-depth interviews with participant, reviews, and documents. It is basically done to comprehend the basic concepts of each perspective or opinions regarding involved variables and process. Regarding the consensus building in developing local government policies, Hull (2007) explains how a technical process was built by an inter-sectoral working. This triggers an experts' interaction. Some experts with different expertise discuss the substantial connection between different pieces of knowledge. They then compare varied opinions and points of view in order to get both the similarities and differences in details. In this point, some small groups are built representing varied perspectives led by an expert in specific discipline.. Thus, a decision resulted from a consensus-building approach will be different from other approaches e.g. top-down approach or decision from majority voice (Susskind, 1999).

The decision might be easier to be implemented in the real world as it is an agreement amongst different concentrations.

2.9. Chapter Summary

The meaning of the city refers to the existence of the city itself. By the definition of the city that covers both physical and non-physical elements, growth of the city is indicated by the changes on those two elements. The city expansion (in physical growth indication) beyond the administrative boundary resulting from an increasing activity and population brings to the dynamic growth of the city.

Growth of the city relates with the growth process especially on the city-forming process. Land use – transport development becomes essential as it generates the needs of movements and creates activity centres and transport network in turn. Land use – transport development is also complicated in their interactions for it dynamically affects each other and affected factors. There are two city-growth's characteristics, i.e. compact and sprawl growth type, which are caused by some inducing and catalysing factors. Different factor impacts to different type of city growth.

In city development, land property becomes matter in most of developing countries. It regards to the needs of lands to infrastructure provision and activity areas. Therefore land use planning considers land tenure.

However, rapid growth of the city in fact generates both positive and negative impact. Especially in developing country, the primary problem in urban growth is the uncontrolled spreading of built-up area. This points to unsustainable development of the city.

These mentioned issues is used to develop the methodology in creating narrative development of the city in the next chapter.

Chapter 3
Research Methodology and Overview of Method to be Developed

3.1. Introduction

This chapter describes the methodology used in this research. Essentially, the methodology has been used in an attempt to achieve the research objectives. An overview of the relationship between land use and transport is first presented to describe the rationale for choosing the methodology. This chapter then goes on to two separate areas of discussions: (1) describing of the methodology to be used in this thesis, and (2) outlining the description of the narrative construction method used to create the thesis. The first part refers to an approach taken in this thesis which shows a logical process to be followed whilst the second part presents a number of steps used to create growth narratives from different disciplinary perspectives of the city, both in the past and the future.

Basically, this research constructs future narratives which take into account past experiences. A bundle of theories were selected and used for transforming information presented from past experiences. Through this, the thesis attempts to create a developmental path from already established theories and is part of the constructivism paradigm as stated by Guba (1990) and Riegler (2011) In this regard, this research collects real-world phenomena and puts them inside the theories to be looked at in the context of a set of different theories. This is undertaken in order to build a perspective in discussing land use and transport development from different points of view.

Referring constructivism paradigm, this research gets people to think what in future might happen. The future also needs to be thought to reduce social, environmental and economic implications. One of many future paradigm approaches is the foresight methodology. In this methodology the future can be thought differently by engaging strategic thinking that takes into account internal and external factor within growth of the city process (Conway, 2006). Hence, narrative method is regarded as a suitable approach to do the foresight method in thinking future city. Previously, discussing the future in narrative way has done i.e. in Megacities on The Move (Forum for the Future, 2010) that clearly described how to apply people thinking on developing strategies to live in future cities. What the future city is can be painted by different scenarios (Forum for the Future, 2010). Those scenarios are created by considering the challenges and the solutions in urban growth.

3.1.1. Land use and transport development

The relationship between transport and land use is very important in spatial development terms since its patterns construct the urban structure. With regard to the relationship between land use and transport, Chang (2006), Wegener (2004), and Webstera (1990) suggest a two-way relationship between land use and transport. This relationship refers to how transport and land use interact with one another reciprocally. The two-way relationship is simply represented by how transport infrastructure affects land use development and land use development then shapes travel demands in turn.

Transport-land use interaction is highly complex and always changes over time between different spaces and technologies. The complexity of the transport-land use interaction is not only shown by a dynamic relationship between land use and transport itself but also through other affected variables such as economic, policy, population etc. The interplay between each affected variable and the main variable - land use and transport - is the most complex causality interaction. Many models have been developed as approaches to resolve and predict what will happen in a particular place as a result of this relationship. The framework of these models generally considers the impact of the interaction between land use and transport (Wagener, 2004). Patterning and predicting the trip flow, cash flow and level of accessibility are some of the examples.

Most land use-transport models in this regard generally use quantitative data for the prediction and optimisation process rather than utilising qualitative evidence. Quantitative approaches are expressed by counts and measures of things (Berg, 2004). Quantitative research is seen as precise with exact number calculations regardless of the fact that some experiences cannot be explained by a simple numerical value. On the other hand, a number of important subsystems are identified, which incorporate variables associated with the relationship between transport and land use development. These include network, land use, workplaces, housing, employment, population, good transport, travel, urban environment and policy instruments. However, the models are not able to consider these variables comprehensively, due to the limitations of using quantitative data as the basis for analysis. In fact, this is a limitation of transport and land use modelling that should be taken into consideration during the modelling phase. Therefore, this thesis corporates both the quantitative and qualitative approach, applying a narrative method in order to capture and consider neglected events.

In a nutshell, other approaches are possible to be used in land use-transport interaction research. Land use interaction modelling, as one of the examples, discusses how transport and land use influence one another by considering a dynamic process within the relationship. The land use-transport models are indeed computationally complex, considering a dynamic process within it. These models adopt a particular disciplinary perspective. Here, the theory underlying the models provide computationally complex methods for applying the disciplinary theories that this thesis is considering. As such, they provide an alternative way of constructing narratives from a particular disciplinary perspective. Using them in constructing narratives in this thesis would detract from the key aims of this thesis.

This thesis does not follow the predict and provide approach in imagining the future condition of the city. In this term, predict and provide approach seems far from sustainable development perspective. In case of transport provision, following predict and provide concept, the future needs on road and other transport infrastructures will be anticipated considering extrapolated data. The provision of transport infrastructure needs is fulfilled by forecasting the growth of the car and trip using quantitative approach. However, based on foresight methodological paradigm, the future can be thought differently by engaging strategic thinking that take into account internal and external factor within growth of the city process (Conway, 2013).

3.1.2. Creating a methodology that considers city growth using a narrative approach

This research studies city growth. City growth is a complicated process since it involves many elements. Accordingly, there are many points of view in understanding the growth which is represented in different disciplinary perspectives.

Along with academic knowledge in understanding the growth of the city, evidence can also be examined to observe the growth of the city in a real-world scenario. Therefore, this research combines these two approaches to comprehensively understand the growth of the city. In this regard, the evidence is obtained to define possible determinations and relationships amongst city growth factors. A scenario of real city development is then used in order to obtain empirical evidence of growth.

To this end, this research uses a case study as the research strategy. In order to pursue this approach, there are different kinds of data and evidence sources to be assessed. In this respect, Yin (2009) argues that a case study strategy allows various types of relevant empirical data and evidence to be dealt with.

Furthermore, there are three big sections in the research methodology of this thesis which essentially refer to generic theories, development of the past city narrative, and development of the future city narrative. The remaining sections of this chapter will present the overall research methodology, a description of each sub-method, and a summary of the three sections.

3.2. The overall research methodology

This section broadly maps the essential method used in this thesis and frames it into thesis chapters. Presented in Figure 3.1 are some boxes that represent the logic of thinking required in this research. They are grouped into three parts: part A (generic theories), part B (development of past narratives for a particular city), and part C (development of future narratives for a particular city). The next few paragraphs in this subsection will explain this further.

Part A: Generic theories. This part is expected to be applicable to any city. The generic part refers to already established perspectives of city growth from different disciplines. A classification table, by considering certain criteria, deals with the differences between disciplinary perspectives that will result in a set of possible

criteria combination.

Part B: Development of past narratives. Historical evidence will be used in creating past narratives for the city growth in this part. A narrative is created for a particular disciplinary perspective. Evidence taken from the case study city is an essential element, as it defines the form of the theoretical perspective used in the remaining segment of the method. To justify the case study city used in this research, a classification of cities in which the chosen case study city is located needs to be understood. This justification is needed in order to gain extra information to describe the general characteristics of the chosen case study city.

Using the set of possible approaches examined in Part A, a causal loop diagram is produced as a logical thought process relevant to a particular disciplinary perspective. The causal loop diagram determines cause-effect relationships between events that set the narratives. Each discipline will then have a narrative that is possibly different.

Part C: Development of future narratives. Future narratives of the city are created by considering the section on past evidence. Accordingly, a similar method that is used in creating the past narratives is applied in order to create future narratives. The causal loop diagram created in the past narrative will be followed in defining the causal relationship between events. These events are used to create narratives. However, since the future cannot provide actual evidence, the important part of creating a narrative will likely be substituted with the relevant future plans for a particular city.

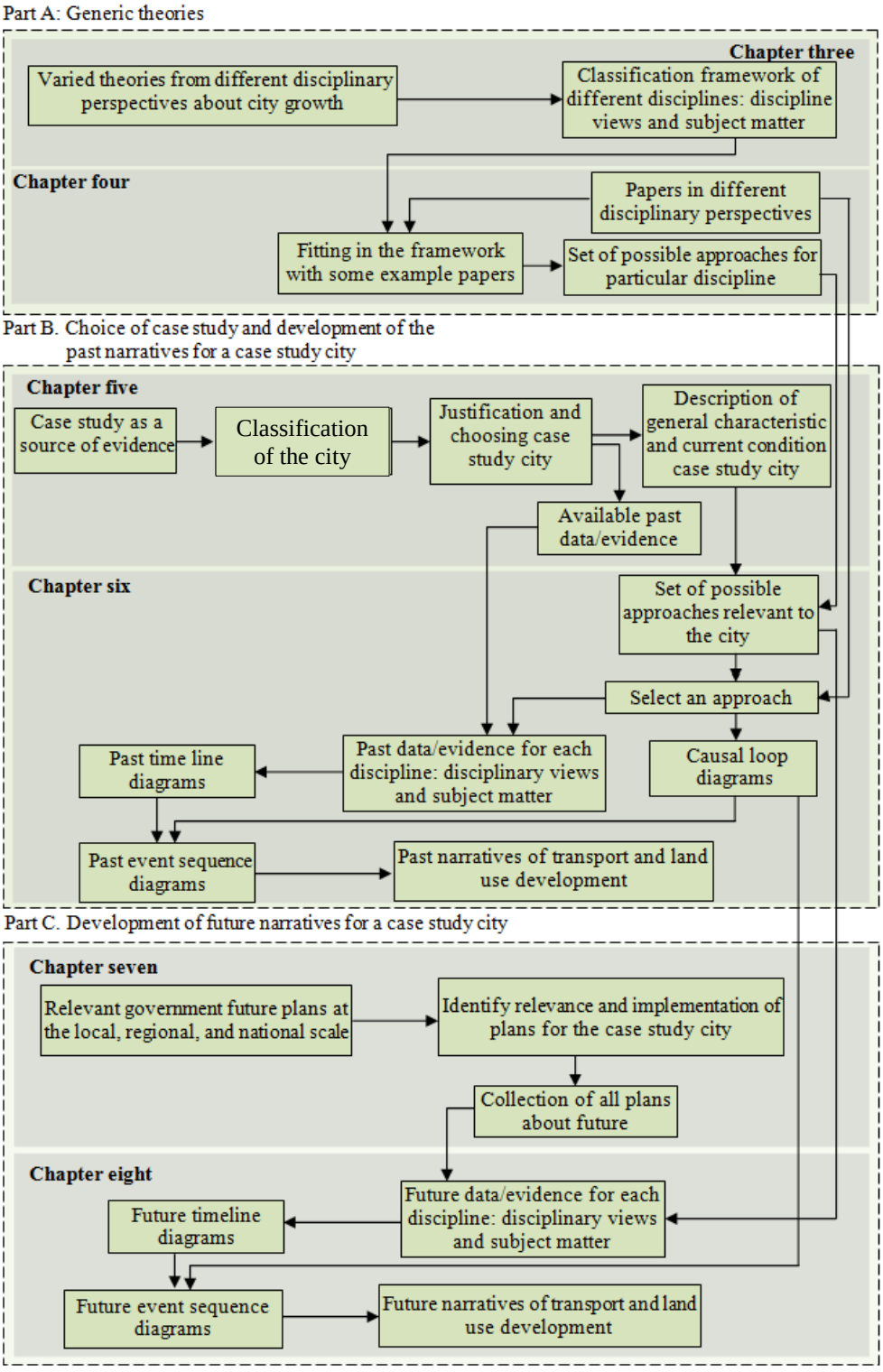


Figure 3.1 Overall Research Methodology Diagram

3.3. Description of the narrative construction method

This section presents an outline of the narrative construction method for creating the city growth narratives. It explains a number of steps conducted in producing the output of this thesis, as shown in **Figure 3.2**.

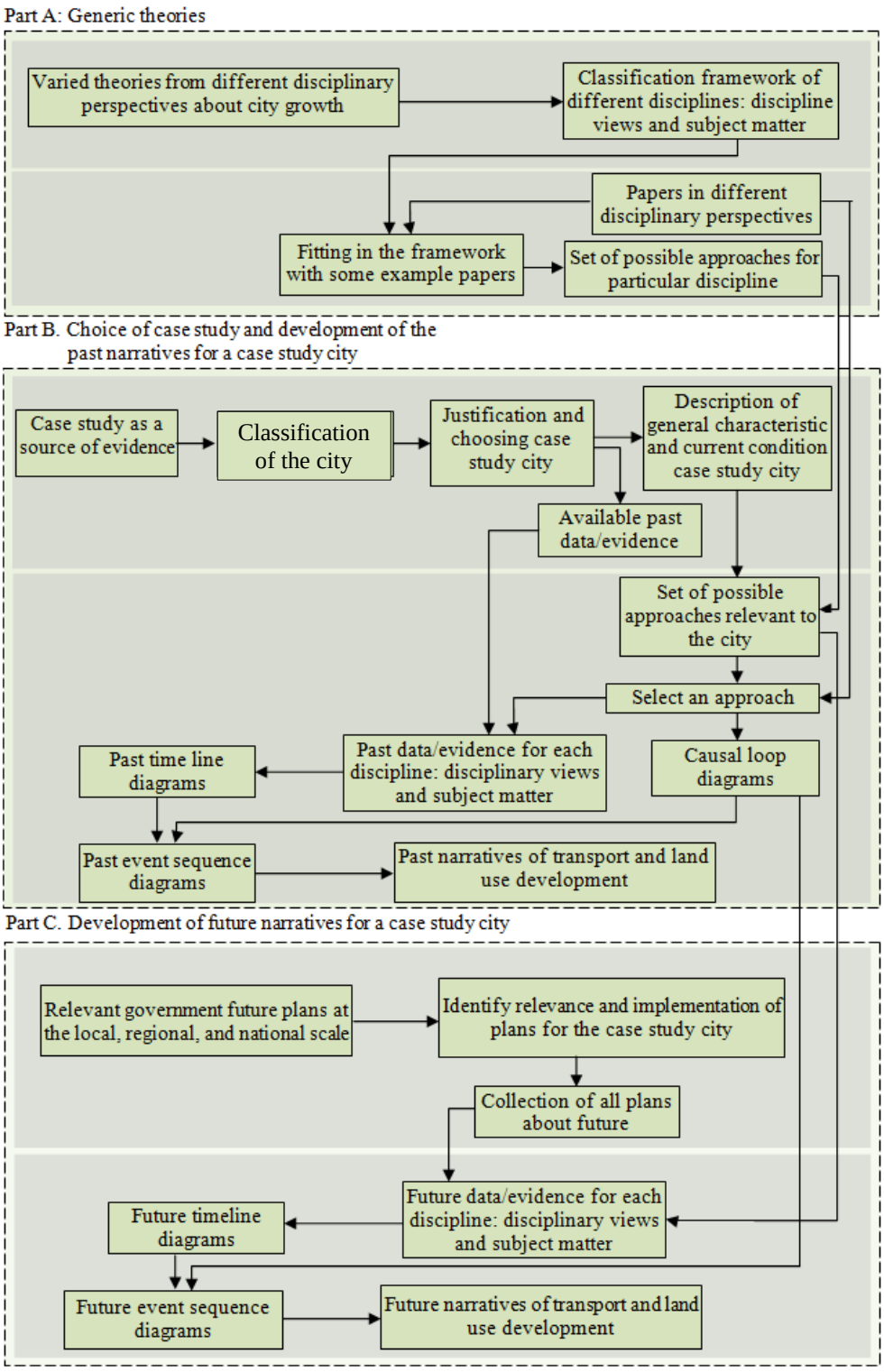


Figure 3.2 Narrative construction method

3.3.1. Generic theories concept

As stated in the previous section, the term ‘generic’ leads to an understanding that is applicable in any conditions. The ‘applicable’ term consists of generic perspectives, concepts, and patterns. Findings in this part are used to further define some elements of the theoretical perspective which are relevant for more than just a specific city. The generic theory concept contains (1) varied theories from different disciplinary perspectives of city growth, (2) classification frameworks of different disciplines, (3) papers from different disciplinary perspectives, (4) fitting from some example papers to the frameworks, and (5) sets of possible approaches for each particular discipline. The first three sections will be presented in Chapter Four and the remaining sections (sections Four and Five) will then be delivered in Chapter Five.

3.3.1.1. Varied theories from different disciplinary perspectives of city growth

This section delivers varied knowledge regarding the growth of the city from different disciplinary perspectives. The established theories are presented to aid understanding of the logical thinking and the literature reviews underlying the research. Theories taken from the literature are used in engaging logical thinking for determining the relationship between events in the real world. The theory is put forward as the first consideration in understanding the empirical events.

Theories explored in this research are those that adhere to the field of city growth from various disciplines. Following Glaeser et al. (1992), Wilson (1998) and Beall et all (2009) there are seven examples of disciplines that specifically concern with land use and transport development in accordance with city growth. Drawing upon the Glaeser’s perspective, the growth of the city could be seen from the economic perspective as the growth which is triggered by both direct and indirect effect of economic activities especially industrialisation. City growth also emerges as a consequence of geographical position that enables movements among places. This movement is motivated by economic reasons discussed using the economic-geography perspective. Regarding this, Wilson (1998) states that the growth of the city is seen from how the transport activities, operations and use work together, as well as represented by the land use and transport development. In particular, the last statement refers to the transport studies perspective. Moreover, interactions between

the people provide some opportunities to learn from each other and transfer information that basically is a key point in the sociology perspective. Regarding the development of technology and dynamic changes in a city, a historian's point of view sees it from time to time.

Meanwhile, in the introduction of their working paper, Beall et al (2009) argue how cities become a centre of economic, development, and social melting pots that in turn triggered the social changes. In this respect, urban growth and urbanisation that lead to agglomeration give the benefit and influence some spatial impact. Resulting in this condition some different perspectives address the understanding of urban growth including economist, historian, geography, and sociologist.

City growth can also be understood from how the city changes over time by using spaces as the key *development*. Urban planning provides a particular place for a vision and follows it through using a framework to be developed in an orderly manner. Engaging all of the mentioned frameworks this thesis concerns seven disciplinary perspectives: transport studies, economist, geographer, economic geographer, city planner, historian, and sociologist.

3.3.1.2. Classification framework of different disciplines

This research accommodates both theoretical perspectives and empirical data from a real city. A wider discussion on the city growth topic from many disciplines obviously requires a framework of thinking to map the perspectives of the related disciplines. Therefore, this section provides a framework, which is later set as a classification table, to accommodate the different discussions regarding the city growth.

Looking at the number of discussions regarding growth of the city, there are many criteria to which those discussions adhere. Respecting those city growth criteria, this thesis uses 9 criteria which are represented in a populated table presented in chapter 3. These criteria are (1) spatial perspective, (2) the role of transport, (3) the role of city planning (4) other causes of growth, (5) type of country, (6) city/region type, (7) city definition, (8) transport provision, and (9) city characteristic. City's expansion that is closely related to the physical elements of cities is one of a number of parameters usually used to indicate growth. This is in turn associated with mobility; the wider scope of an area and the farther distance that people need to travel. Physical

changes in a city are simultaneously caused by the interaction between activities and population. In many discourses, increasing population and activities are linked with urbanisation. In their article, Eaton and Eckstein (1997) discuss the role of urbanisation and its impact on city growth processes in accordance with migration that entails human capital. An increase in population as one of the results of urbanisation also delivers a concentration of many activities in a specific area. This is influenced by geographical considerations, city characteristics, and the role of institutions (Black and Henderson, 1999; Storper, 2010). Here, land use becomes an essential element of the city regarding the possibility of changes in accordance with causal development.

However, each city has unique characteristics that influence the response to the growth stimulation. These characteristics usually appear in pattern and function.

Based on the disciplinary standpoint, certain numbers of criteria are set to determine variables which will be used. In other words, there are two distinguished criteria: disciplinary views and subject matter. Disciplinary views represent considerations of disciplines from academic knowledge. They frame a perspective from theoretical points of view regarding the role of pre-determined criteria on city growth processes. Disciplinary views are laid on theories which are grouped based on the knowledge obtained from field experiences. Some criteria are proposed to express disciplinary views. They are spatial perspective, growth process type, the role of transportation, the role of city planning, and other causes of growth.

To the extent that people will differ in using the defined criteria mentioned above, each criterion is thoroughly broken down into sub-criteria representing a part of the discussion of a specific criterion. Articles on perceptions regarding a particular criterion are taken into account in deciding the sub-criteria.

This framework is a table which can be populated by relevant papers. Papers are used to represent the perspectives of a particular discipline. In accordance with the classification criteria, a perspective will contain a set combination of criteria. Accordingly, from the framework, a set of different criteria combination perspectives can be created from within a discipline.

3.3.1.3. Papers from different disciplinary perspectives

There are many different perspectives in understanding the growth of the city. Accordingly, there are various academic journal papers from different disciplinary perspectives which would represent these differences. The papers are taken from different disciplinary perspectives. In fact, there is an enormous number of papers concerning the growth of the city. Therefore, the papers which are used in this research are those that have fulfilled some requirements i.e. related to the growth of the city discussion, published after the 1980s, and concerned with the framework criteria.

In accordance with this, this research takes some previous work as examples. This is performed by assuming that even though the articles have different viewpoints in seeing the growth of the city they all basically take a particular disciplinary perspective. The impact factor index is used as a consideration in choosing relevant example articles. The impact factor is a measurement of the frequency a particular paper been cited in a particular period. The citation could represent how interesting the article is to different researchers within a specific discussion (Thomson Reuter, 1994). Furthermore, there are also specific criteria to narrow down the field in selecting the example articles. The papers will then be used to populate the framework in the next step. In order to understand the differences, the created framework which is represented by a table using the previous step will be filled in by papers from different perspectives.

Different disciplinary perspectives lead to different points of view in explaining the growth of the city. Papers from different perspectives in this regard are collected to be populated in the framework table.

3.3.1.4. Fitting in the framework with some example papers

In order to illustrate how the framework can work, the table is populated with various articles. These articles were previously analytically reviewed. The framework, as mentioned before, leads to the development of a set of perspective combinations within disciplines. It is acquired by an analytical review of numerous articles related to the growth of the city. The use of some different papers is aimed at capturing a wide perspective of the topic. The considered papers are populated based on their involved criteria. Each row represents a group of sub criteria having on a particular paper. However, it is possible there is a blank cell for a certain criterion in a particular

referred paper. In this case, it is better for having a number of papers so that the blank cell on a paper can be populated in other rows from different paper. It is because the un-populated cell is assumed to be covered by other papers in a specific classification table. This is done in order to get a picture of how the framework is addressed in real-world papers.

The review, in this respect, is a process of looking over papers content regarding certain criteria in the framework. It is formed with an in-depth analytical review of the papers referring to a particular discipline. There are obviously different approaches from various authors in expressing their thoughts for the growth of the city.

In a nutshell, the table is populated by a number of journal papers reflecting growth of the cities issues from the considered disciplines. The table is prepared for different discipline and each table will address the literature for a specific discipline. Therefore, each table is addressed to a particular discipline and populated with some related journal papers. The journal papers are those that significantly concern with the framework criteria.

Some different possible sub-criteria combinations can be set up. Therefore a set of approaches for a particular discipline is a set of numerous sub-criteria combinations from various perspectives within a discipline.

3.3.1.5. Set of possible approaches for a particular discipline

A set of approaches for a particular discipline maps how disciplines depict the growth of the city from various perspectives. It is a diagram that links sub-criteria resulting from the populated table of criteria in the previous step. In order to picture possible combinations of those sub-criteria, each sub-criterion is connected to one another. The combination of criteria within each discipline will finally explain how the discipline captures the relationship between transport and land use in accordance with the growth of the city. A set of approaches has many possible combinations of sub-criteria. To be applied to the next step, the evidence of a particular city needs to be considered to define a set of sub-criteria from varied sub-criteria's combination. It is then marked as a set of colour-coded sub-criteria, namely an approach.

3.3.2. Development of past narratives

This part of the method aims to develop narratives of the city based on the examination of past evidence. Moreover, this part also places evidence as an important element in this research, as it becomes the centre of discussions.

The steps in this part refer to the position and use of the evidence in research. These 12 steps are (1) the case study as a source of evidence, (2) classification of the cities, (3) justification and choosing the case study city, (4) a description of general characteristic and current condition of the case study city, (5) available past data and evidence, (6) a set of possible approaches relevant to the city, (7) selecting an approach, (8) causal loop diagrams, (9) past data evidence for each disciplinary view and subject matter, (10) past timeline diagrams, (11) past event sequence diagrams, and (12) past narratives of transport and land use development. The next sections will present a broad explanation of these aforementioned steps.

3.3.2.1. Case study city as a source of evidence

The case study city links the generic theories-that can be applied to any situation, with the real world represented by the city. The case study city is an important part of this thesis since it provides actual evidence to be considered in choosing the relevant approaches.

The case study refers to a specific situation. It is not the purpose to gain a general finding, but concentrate findings on a particular city. However, this can analytically provide a situation which can be used for comparing with previous theories (Yin, 2009).

Since different cities have different characteristics, each city also has different development characteristics. These differences can be seen from, for example, the important events in the city's development and development patterns (Scott and Storper, 2013).

3.3.2.2. Classification of cities

A city classification represents a different type of city. The classification may differ across the countries. Accordingly, there are some different ways to classify cities.

Considering city classification will then lead to understanding the character of the cities.

3.3.2.3. Justification and choosing the case study city

The justification for the case study can be referred to in terms of the basic characteristics of a typical city, with respect to the city size, the type of city in its main activity or geographical position, or level of hierarchy in the city system. It is done because different types of cities have different characteristics that affect their development pattern.

3.3.2.4. Description of general characteristics and current condition of the case study city

A description of the case study city delivers broad information about the characteristic of the case study city. This description covers city conditions regarding economic, population, geographical, and policy variables. The information for the city characteristics is summarised from different reliable sources.

Later, the description of the case study city collaborates with the set of possible approach created earlier. Characteristic of the case study city is regarded to determine a selected approach.

3.3.2.5. Available past data/evidence

Data and evidence are taken from events which have occurred in the city's evolution over time. These are recorded and bound in city development documents that can be found from many different complementary sources. The information is used to triangulate and generate valid and reliable data and evidence. This triangulation, carried out through complementation of various kinds of information, can also possibly overcome the lack of any formal government data and evidence. When there is the unavailability of government documentation, information can be complemented with written descriptions or other qualitative information (Sterman, 2000). The chosen data and evidence in this section are considered as the events that are likely to have an important influence on the occurrence of other subsequent events.

3.3.2.6. Set of possible approaches relevant to the city

In order to define which approach to be followed, this step brings the generic set of approaches from part A of the methodology's step down. The possible sub-criteria combination presented on 'a set of possible approaches for a particular discipline' will be considered in determining a chosen set of sub-criteria combination. In this stage, some approaches can be chosen to be followed in accordance with their logic of thinking in understanding the growth of the city. This process regards the case study city's characteristic informed in the previous step, the general characteristic and current condition of the case study city.

3.3.2.7. Select an approach

Essentially this step is a process to choose some sub-criteria to be used as an approach. It will give a specific coloured code to a diagram of possible criteria combinations. Each event is relevantly fitted with particular criteria from 'a set of approaches for a particular discipline'. A combination of these criteria arranged as an approach considering evidence from the case study city.

Resulting from the previous step, there will be a number of approaches that contain various possible combinations of sub-criteria. However, in accordance with the scope of this thesis, only one approach will be used. The characteristics of the case study city enable a set of appropriate criteria to be determined by using this approach. In doing so, a table is prepared to help in describing case study city conditions. This table is extensively used to fit the relevant criteria taken in the next process.

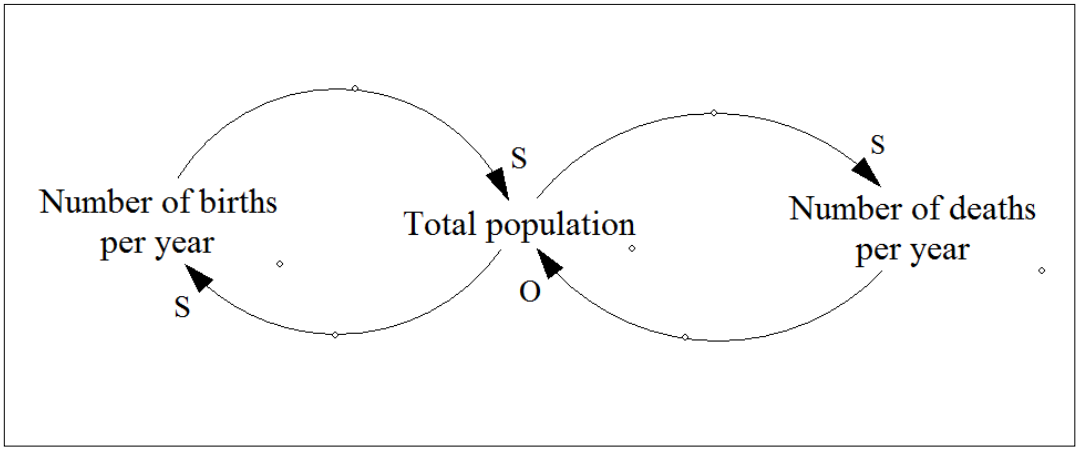
Choosing a particular set of subcriteria might be a challenge in this process. In order to ease this process, a journal paper example from the 'paper in different disciplinary perspectives' can be taken to be followed in the discussion considering the city development factors. Here, there is some subjective judgements in determining which paper is suitable with the case study city regarding the essential city development factors.

3.3.2.8. Causal loop diagrams

A causal loop diagram (CLD) is used to help us understand the complex issues and dynamic phenomena in the real world (Kim, 1995). Borrowing the idea from Sterman (2000) in his practical method on system thinking and dynamic modelling, the causal loop diagram represents relationships between variables. With respect to variables, Pfaffenbichler (2008) refers to an entity in a dynamic system which causes changes to other entities in addition to itself. The variables should represent those that are believed to be the genuine cause of change.

CLD introduces a causality relationship pattern shown by linking two variables within the diagram. The relationship is depicted by an arrow. A variable on an arrow-base point represents a caused factor and it affects an occurrence of the other variable on the end of the point-arrow. In this regard, Pfaffenbichler (2008) mentions that arrows are used for showing causal influences between variables.

In creating a causal loop diagram, there is a rule of increasing and decreasing effects being represented by the notation (+) and notation (-), respectively. Hence, if a variable influences the impacted variable positively, then the (+) should be given to the variable on the end point-arrow and (-) for the decreasing causes. The other alternative is to show the relationship between two variables by using notation “s” (same) and “o” (opposite). Similar to the previously mentioned notations, the “s” depicts a positive correlation between the cause and effect variables. The increase of the cause variable will increase the variable on the other side of the arrow. In the case of the “o” notation the variable increases, the affected variable will decrease. Figure 3.3 presents an example of a causal loop diagram with respect to how the CLD depicts the causality relationship. The diagram shows the relationship between the number of births per year, the total population, and the number of death per year. The arrows connecting the two variables represent the influence flow from cause to effect. As the top arrow is notated “s”, an increase in the number of births per year causes an increasing population. In the same way, an increase in the total population causes an increasing number of deaths per year. The notation “o” linking the number of deaths per year and the total population shows that an increase in the number of deaths per year causes a decrease in the total population.



Source: taken from Pfaffenbichler…..

Figure 3.3 An Example for CLD of Relationship

This thesis will use a CLD that links variables considering their causal interaction. The variables are the selected events that represent a set of criteria within a pre-determined approach. The variables are those that are chosen from events deemed essential for the growth of the city taken from a particular disciplinary perspective. In this regard, an event represents a specific sub-criterion defined in the classification table that is depicted in a set of relevant approach diagrams. In doing so, as mentioned in the previous step regarding the use of a particular journal paper, the events used in the CLD can be taken from a paper example journal.

The pattern of relationships within a causal loop diagram will possibly be different in accordance with the logical thinking from particular disciplinary perspectives. Therefore, the created CLDs will be different from one another, depending on the disciplinary perspectives. The causal relationship diagram explains the causal relationship between numerous factors within the city growth process.

3.3.2.9. Past data/evidence disciplinary views and subject matter

In this section, data and evidence are taken from available past data and evidence identified in the previous section. The selection process is undertaken to include different disciplinary perspectives; since each discipline has different perspectives in identifying the growth of the city. It will then clarify the differences amongst disciplinary perspectives.

3.3.2.10. Past timeline diagrams

A timeline diagram is presented to show the city's evolution over time. The timeline diagram is a diagrammatic sequence of data to easily depict events which have occurred in a particular city. It will capture many events in the city's past development journey. In creating the timeline, recorded events are sequentially arranged. It cannot be denied that the recorded events will not cover every single aspect in each city's long history. However, the timeline diagram offers a broad picture of the historical growth of the city.

This diagram has an essential role in describing how different events appeared time by time. Using the timeline diagram makes it easier to detect the order of events and to help define the causal relationship amongst variables in city development.

As there are varied disciplinary perspectives, each will be presented in different timeline diagrams. Each diagram, therefore, represents the perspective of each disciplinary background. A formed timeline diagram then describes the events occurring over time, from the standpoint of different disciplines. The timeline is presented in a continuous fashion, therefore the recorded events depicted on it will expand as the time goes on.

3.3.2.11. Past event sequence diagrams

Various authors from different disciplinary backgrounds have used the term 'event sequence diagram' (ESD). Authors from a system engineering background state that ESD is a visual representation of a scenario to monitor the process of industry (Swaminathan and Smidts, 1999). Whilst in computer knowledge, the ESD reflects a flow diagram of programming ordered sequences (Bell, 2004).

Event sequence diagrams in this thesis are diagrams that describe a journey of the city's development over a long historical period. They are created by connecting related events in accordance with the causal relationship from the perspective of a particular discipline. This diagram also represents how an event influences the emergence of other events. Moreover, the diagram can be a guideline in writing the narrative of city development.

As mentioned in the previous subsection, the event sequence diagram incorporates the causal relationship diagram and the timeline diagram. Therefore, it represents the

growth of the city over time and the factors involved in city growth from different disciplinary perspectives. As this diagram uses a timeline diagram for consideration, it is also a continuous process that will not terminate at a specific event. However, since there is a year of origin for every data collected, a bundle of evidence is presented from the past to the most recent time.

3.3.2.12. Narratives of past transport and land use development

In essence, a narrative of a particular disciplinary perspective describes an event sequence diagram. As the event sequence diagram explains the causal relationship between events, a narrative contains a description of city growth regarding land use and transport development in accordance with the interplay between them. The narrative is created considering the situation at the time it happened.

3.3.3. Development of future narratives

Determining future city conditions is interesting since it concerns the estimation of the future impact of land use development and human activities (Barredo and Demicheli, 2003). Furthermore, as the city grows, so does the economy. Capital will flow into cities for investment and infrastructure construction, as well as migration.

Predicting the future involves three main processes: looking back to the past, assessing what is happening in the present and looking toward the future itself. In other words, studying the future not only makes a prediction about what will happen in the future but also involves looking back to the past to see how it relates to the envisaged future (van der Duin, 2012).

In a sense, studying past evidence would appear to be predicting future conditions that will repeat the past. There are lots of possibilities. If in the past, transportation has shaped the city, in the future we might observe an opposite pattern: cities may start to shape mobility (Forum for the Future, 2010).

This thesis provides potential futures narratives that describe how a particular city is likely to evolve. In doing so, this thesis considers a narrative approach that is assumed can help to carefully tell a comprehensive growth story of the city. However, the future is inherently unpredictable. There are numerous ways with different arguments in predicting the future, so in creating future narratives some assumptions are needed. One of several approaches in the future prediction is the ‘predict and provide

approach'. The idea is that in order to shape the intended future city condition, a prediction process is needed to estimate the demands for the time yet to come (Owens, 1995; Houston, 2003). Then, following the philosophy of 'predict and provide approach' the provision is made to match the projection of demands. In some reasons, the future condition depends on the provisioning concept adopted.. Here, the way on how the demands are fulfilled will influence the future city condition.

However this thesis does not follow the 'predict and provide approach' in imagining the future condition of the city. In this term, predict and provide approach seems far from a sustainable development perspective. In the case of transport provision as an example, following predict and provide concept, the future needs on the road and other transport infrastructures will be anticipated considering extrapolated data. The provision of transport infrastructure needs is fulfilled by forecasting the growth of the car and trip using quantitative approach. Accordingly, this thesis engages a complex narrative as mentioned before to draw and construct a possible future that reckons all things might happen. This might able to develop alternative solutions for complicated problems by highlighting the possible conflict on economic, city's social, environment, and also technology that basically is a part of sustainability development concept.

In order to pursue the aims of this thesis, those varied assumptions are simplified by using planning documents. The future is likely put as an intended condition that has already been designed in relevant plans. In this regard, planning documents are usually officially used as guidance in conducting city development. This points to an intended condition of a city in the future considering the city's potencies and development possibilities. This means that city plans are considered assumed as planning documents that take into account all aspects of the city development processes. The created narratives should be consistent with the point of view of the planning documents. However, borrowing city practitioners' experience, city planning documents cannot precisely define how the city in the future is as it can be 100% applied for the reason practical implementation. Therefore, besides the official city planning documents, there is related likely future condition informed by the trend of regional development and issues might be considered.

This section broadly presents seven steps in creating a future narrative of transport and land use development. It develops future narratives regarding the imagineering of

the future development of transport and land use of the city, in accordance with the city growth concept. It initially uses the event diagram from the first research process to understand the causal relationship between some related factors in the city growth based on evidence.

The next step is then supported by future planning documents which relate to the intended city development. It includes city planning documents, city development strategies, and some thoughts referring to the case study city. Drawing together understanding the causal relationship, event diagram and projection documents, there are some alternative scenarios of the relationship between transport and land use to be created.

3.3.3.1. Relevant government future plans at the local, regional, and national scale

There are obviously varied manners which might be used to see a city in the future. Using data collection methods to forecast, or reading information from other texts are two examples of this. However, considering the comprehensive discussions and development implementation, government planning documents are likely to be relevant. In order to have some development in the area, the government produces a number of development plans. The development plans are mostly created considering the projections or by forecasting of urban life. The government projection documents commonly present future policies in developing the city in order to represent a comprehensive study. In this regard, a city planning document is understood as a planning document that is compiled in accordance with many considerations such as physical condition, economic, social, political, etc.

The development plan can be divided into different scales, i.e. the national, regional, and local levels. The planning documents usually introduce more details moving from the highest to lowest level plan.

On the other hand, knowledge continually develops in line with the growth of new theories to solve city problems. In this respect, future thoughts related to the case study city taken from numerous authors are necessary to be explored for the widest possibility in future development.

3.3.3.2. Identification of relevance and implementation of plans for the case study city

Data and evidence that will be used in this thesis are collected from three different planning levels. Specifically, in Indonesian cities, the planning documents cover national, regional, and local level. Therefore, this section will identify the relevance of those that are in the higher levels of planning suitable for the local case study city's direction and development programs.

3.3.3.3. Collection of all plans about future

All plans for the future will then be collated in a specific table. This table of data and evidence will be referred to for the process of selecting data and evidence, regarding particular disciplines. The table informs the categorisation of events and the year of implementation.

3.3.3.4. Future data and evidence for each discipline: disciplinary views and subject matter

In order to create a narrative from different disciplinary perspectives, all data and evidence in the table of collated plans for the future will be judged. This judgement is a process of choosing the relevant evidence for a particular disciplinary perspective. It considers the chosen evidence in the creation of past narratives.

3.3.3.5. Future timeline diagrams

A future timeline diagram is a diagram showing a group of selected data and evidence. The data and evidence are to be chronologically ordered and the groups of data and evidence are taken from the collected data in the previous section. The future program-plans of the city are assumed to be future events.

3.3.3.6. Future event sequence diagrams

A future event sequence diagram is a diagram connecting events with respect to the causal relationship from the causal loop diagram which was created in Chapter Seven.

All of the data and evidence in the timeline diagram are considered following the specific causal relationship between two variables presented in the causal loop diagram. Accordingly, there will be different future timeline diagrams for different disciplinary perspectives.

3.3.3.7. Narratives of future transport and land use development

Narratives of future transport and land use development are the results of the methodology. This part is an explanation of future city development following specific, logical thought in the narrative presentation. The narrative links the future events that are already set in chronological order.

3.4. Chapter summary

Land use–transport interaction is highly complex, dynamic and involves many other affected variables. This interaction has been concerned by many scholars. One of those concentrations is represented by land use – transport model that developed to resolve and predict what may yet come due to this relationship. Most of land use – transport model use quantitative data and approach in analysis process as this method is seen more precise by utilising exact number calculation.

Narrative approach, on the other side, engages with qualitative data to be examined in order to achieve a flexible view. It is because the analysis considers relevant data and evidence. Therefore, data and evidence is also an essential component in this research, both for the past and the future condition.

There are three big parts of methodology will be considered to conduct this research i.e. generic theories, development of past narratives for a particular city, and development of future narratives for a particular city. First part is about a set of method to create a possible combination criteria that can be applied to any city. This part engages with theoretical term in defining logical thinking for determining causal relationship between events. There are seven discipline which are concerned in this thesis. The second and the third parts relate to a particular city characteristic in past and future development, respectively. Hence, relevant real data and evidence are a crucial part of this section.

Chapter 4: Creating a Framework to Classify Alternative Disciplinary Approaches to Understand City Growth

4.1. Introduction

This chapter aims to create a framework to classify different disciplinary perspectives in an attempt to understand city growth in accordance with the land use and transport development. This understanding is also expected to clarify the complexity of land use and transport development (Wilson, 1998). It is then utilised to provide context to the overall research objectives mentioned in chapter one.

In defining the aims of this chapter, a wider discussion on the topic of the city growth from many disciplines requires a framework to map the relevant perspectives of related disciplines. As mentioned in Chapter Three, the framework is established by creating a table of criteria that represent some perspectives within a particular discipline. Figure 4.1. shows a proposed table of classification as a framework to understand the various perspectives in city growth.

In this research, a multidisciplinary study is carried out to obtain an understanding of city growth by consolidating knowledge from different disciplines. In this manner, some concepts from varied disciplines are reviewed and considered to complement the intended understanding (Ramadier, 2004). The selected disciplines, as mentioned in Chapter Three, are those that are concerned with the growth of the city from the perspective of transport studies, economics, geography, economic geography, city planning, history, and sociology (Glaeser et al., 1992; Wilson, 1998; Beall et al., 2009).

A framework table, mentioned previously, is arranged from the criteria that characterise city growth specialities. In this sense, the criteria are defined as standards or values used for making decisions or judgements. The criteria would then determine the understanding of city growth classification. The framework table is categorised into disciplinary views and subject matter. The understanding of multidisciplinary perspectives, both in disciplinary views and subject matter, is expected to result in a complete set of characteristics from the considered disciplines (Chorley, 1967).

Simply put, this chapter is outlined in Figure 4.1. shown below through the creation

of a framework to classify alternative disciplinary approaches to understand city growth. It is a part of the overall research approach explained in Chapter Three.

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (B)	The role of transport (C)	The role of city planning (D)	Other causes of growth (E)	Type of country (F)	City/regional type (G)	City Definition (H)	Transport provision (I)	City characteristic (I)

Figure 4.1 A proposed table to build multidisciplinary concepts in understanding city growth

4.2. Disciplinary background

The disciplinary background is a starting point to analyse the criteria taken from other disciplinary criteria. Here, seven disciplines are selected and presented, namely transport studies, economics, geography, economic geography, urban planning, history and sociology.

4.2.1. Transport studies

Transportation activities cannot be separated from human life activities. Transport has a central position in the movement of people or goods from one place to another (O'Flaherty, 1997 p. 2). In transporting raw materials to manufacturers, people need infrastructure, modes or services. In addition, it is necessary to facilitate product distribution to consumers. In order to get to their place of work, people also undertake transportation activities. Hence transport is highly related to numerous aspects.

Since transport studies can cover a wide variety of applications, the transportation system is considered effective in an attempt to understand the core point of transport studies. The transport system is highly related to the movement of both freight and passengers. Thus, it fundamentally connects transport with those that build the transport system such as transport nodes, transport network and transport demand (Rodrigue Theo; Shaw, Jon., 2013). Transport studies as a discipline has always developed over time and adjusted with arising issues.

4.2.2. Economics

Economists generally believe that people behave rationally when they encounter a shortage of services/goods i.e. a situation in which resources are limited and cannot meet demands. In economic terms, needs are infinite while resources are finite. Human needs can be described as everything that gives usefulness and satisfaction to people, whether they be tangible or intangible. On the other hand, resources are defined as factors in the production of goods, such as land, labour, capital, and entrepreneurship. This rational economic behaviour leads people to a fashion of maximising profit and taking costs into consideration. Indeed, it refers to the overall definition of economics: "economic is a science of how individuals and societies deal with the fact that the wants are greater than the limited resources available to satisfy those wants" (Arnold, 2010 p. 2). In turn, this branch of science has grown into varied components which are informed by knowledge in the area of economics, and this includes city growth and development.

From an economic perspective, the growth of cities is considered with regard to economic growth. In this respect, macroeconomic states that several events indicate the growth and can be pointed toward as the causes of growth. For example, an increase in GDP (gross domestic product) that leads to higher productivity in terms of land use and activities and an increase in purchasing activities (Shafer, 1977). The growth, regarding the growth pole development approach, initially emerges in big cities or primary centres that later trigger some multiplier development activities elsewhere. The primary position of the city also defines the city as a place with comparative advantages. Thisse (2010) and Storper and Scott (2009) also confirm that one of the city's comparative advantages is the ability to attract workers with high levels of human capital. Level of skill as well as education and knowledge of the technology of the people are taken into account in this high level of human capital.

Besides comparative advantages from an economic perspective, other factors influence city growth, e.g. (1) city-resource characteristics, (2) flow – where it comes from and where it goes to – of money, goods and information, and (3) specialisation. The first factor refers to the city's characteristics. Every city has its characteristics that promote its economic growth. As mentioned in the previous section, city characteristics are determined by the resources available in that city. The ability to develop their resources is in line with the availability of institutional investment. Thus,

the development of resources follows institutional investment so that an economic increase is expected alongside institutional development. The second factor, flow, occurs when the economy looks for the equilibrium stage. The notion of equilibrium is one that shapes the views of economists. Flow can be exhibited by trading and the emergence of migration that later generates the flow of money, goods or capital (O'Sulivan, 2003).

4.2.3. Geography

Geographers deal with spatial relationships in social processes as well as the human and natural system in the environmental surroundings. Geography, in this regard, is a scientific study to identify and describe the location and distribution of human and physical phenomena on the Earth's surface (Bhatta, 2010b p. 1). Moreover, from a geographer's perspective, there is a viewpoint that deals with the spatial organisation and the arrangement of human activities and their effects on the environment. Bhatta, further argues that geography aims to understand the general principles in determining human location and physical characteristics.

In understanding geography, there are three key concepts: space, place and scale. The first key concept, space, refers to the distance and area where social, human and natural system processes occur. Place, as the second key concept, brings up the uniqueness of specific spaces. In this regard, every space has its uniqueness concerned with its environmental, social, cultural, institutional and political context influences (Coe et al., 2007). Next, scale classifies places according to spatial scales. The scales determine the scopes of the area: global scale, macro-regional, national, regional, local scale and inhabited places. Therefore, thinking about how a place is connected with others and how the economic processes involved in the affected areas are also taken into consideration.

4.2.4. Economic geography

In the preface of the book: Oxford Handbook of Economic Geography, economic geography is explained as below:

> "Economic geography is a sub-discipline of geography and a growing field of study in economics. It is concerned with the spatial configuration of firms, industries, and

> nations within the emerging global economy in all its manifestations. Historically, economic geography was preoccupied with the spacing and hierarchical order of settlements, the optimal location for manufacturing and retail activities, and the geographical structure of trade and communication……..In economic, economic geography has been heavily influenced by international trade theory. The key ingredients in its revival in economics have included agglomeration economies, increasing returns, and imperfect competition" (Clark et al., 2000 p. vii).

Economic geography emphasises the emergence of economic activities which are viewed from a spatial perspective. Economic geography is concerned with the emergence of activities in a particular place, including reasons why particular activities are located in specific places or regions. It also considers links between different activities in different places. As activities are related to the economy, economic geography essentially examines economic relationships between places (MacKinnon and Cumbers, 2011). Simply put, economic geography deals with the flow of people, money, goods and information amongst places. Thus, it also takes into account interactions between places, because these factors are dependent on various resources and conditions in different places.

An economic geographer views city growth as the development of economic activities in particular places. In this regard, in order to distribute products, money, and goods, connections between locations, intercity and intra-city transport become an important consideration. This perspective then takes into account the increasing activities and the presence of transport infrastructure as cause-effect factors city growth.

Broadly speaking, economic geography's views of city growth include:

1. Looking at where primary activities occur. These activities refer to those which generate economic growth and labours increase. Furthermore, knowledge spill-over result from these points of increasing economic growth.
2. Considering the network and interdependence amongst places, which are governed by their relationship.

4.2.5. Urban planning

City or urban planning bears solutions for issues that could possibly occur in the city or urban development process. The benefit for the city and urban areas then become the principal purpose of urban planning. It makes urban planning different from other disciplines that position cities and their hinterland problems as the objects of study.

Borrowing Frederick L. Olmsted Jr.'s statement, city planning is an intelligent control or guide in city formation (Crane, Randall; Weber, 2012) This is due to its effort in solving complex problems in the city development process such as accomplishing place-making. Therefore, this discipline also quotes growth direction in anticipating future condition.

4.2.6. Historian

Regarding the historian perspective, considering the past becomes an important factor. In relation to this, Lampard states that:

> "Historians are accustomed to speak a continuity and change in human affair and, in ordinary discourse, this implication is often given that change and alteration are wholly circumstantial, if not chance, events. But continuity maybe viewed as the periodic or regular recurrence and sequences in the affairs of household and communities, and change as their cumulative or net outcome. Throughout history much of history life has been pattern according to repeated or periodic sequences" (Handlin and Burchard, 1963 p. 234).

Growth can be seen as occurring over a long period of observation. The historical perspective on city growth structures events that occur over time due to their causative relationships (Jackson and Moch, 1989). It analyses how growth has occurred based on evidence-informed by the emergence of past events. Analysing growth from the standpoint of this perspective drives us to chronologically organise evidence for city growth by time.

Historians talk about events that occurred over time. Historical studies analyse and construct continuous events, which are expected to be able to recount the events' pattern in specific places. The events' pattern is structured based on evidence that has occurred over time. In addition, history is classified as an academic discipline which has not been oriented toward immediate problems (Handlin and Burchard, 1963 p. vi).

In accordance with the city growth, historians pay attention to some cause-effect phenomena which are identified from collected evidence. Historically, the growth of the city is seen as being affected by different historical periods, i.e. the initial city growth period – forms the basic shape of city, medieval period – a city was likely to grow within a fortress, during colonialism – there were some differences in a city growth conditions between colonialist and colonial countries, during industrialisation – most cities grew faster in this period as a result of the emergence of technology

development and relationships between cities. The history of a city cannot be understood in isolation from the more comprehensive communities of which it is a part.

Moreover, Handlin and Burchard (1963 p. 4) mention that historians take into account numerous aspects whilst analysing the process of city growth:

(1) Political changes; evidence from historical events indicate that changes in policy have affected the process and the development pattern of the city. In the medieval era, cities had two standpoints. Firstly, they became the conquerors which invaded other territories. In this manner, cities could become rich and generally grew faster. Second, they became the colonies. Colonial cities had strategic potential in terms of resources or position. As an impact of colonialism, these cities did not have any sufficient resources, and as a result, their growth was obstructed. But above all, both positions encourage cities in having a mixed culture in the way they develop.

(2) Economic metamorphosis; the shift of economy leads to an improvement in the development of a city. The shift of agricultural economics to industrial in a certain period is an example of this; the development of agriculture needs some enhancement on an industrial economic basis. Economies which are based on traditional agricultural practices generally have driven the growth rate.

Agriculture is a base of economic activity which later develops into a modern form. It is supported by the emergence of agriculture industrialisation which has led to the presence of industrial machines and modern warehouses. This development leads to the appearance of an economic metamorphosis. In turn, this drives changes in cities in terms of the economic factors which indicate city growth.

(3) The influence of technologies

Urbanisation has recently become a new trend in urban growth theory, by historians – who knit and notice events which occur over time, it is seen as a complex interaction between economic development, division labour, agglomeration, specialisation and external commerce. Lately, the existence of a city is resided by their role as centres of the economy both in production and distribution within a world-wide system (Scott and Storper, 2013).

4.2.7. Sociology

Sociology studies the relationship between people and communities. This relationship can develop dynamically in accordance with the growth of other factors such as technology and the economy. Sociologists try to explain a specific situation through an understanding of social practices based on the knowledge of the interaction between people in a community.

Using a physical indicator to measure the growth of a city is usually considered easier because it provides a spatial pattern that is quantifiable. However, to gain a comprehensive understanding of city growth it is necessary to examine both physical and non-physical indicators (Gale and Moore, 1975). Therefore, sociology looks at relationships either amongst communities or people that construct social systems. Amongst other things, it analyses how the social system can develop and cause relationships within the system. Regarding city growth, sociology considers issues of communities including localities in the growth process (Molotch, 2011).

4.3. Spatial perspective

The spatial perspective is closely related to the place[1]. Diversified places can have various characteristics despite being located in the same region (Pacione, 2005; Capello, 2009). The spatial perspective is concerned with identifying where the activity is located in the space. It also defines the geographic scale perspective such as city, region and globally. The spatial perspective deals with the geographic analysis of city (Pacione, 2005). The spatial perspective covers (1) autonomous perspective, (2) regional perspective and (3) global perspective. Autonomous and regional city perspectives are distinctive as they focus on how cities develop. It investigates whether a city grows individually with endogenous growth factors or within a system of a particular region. A global perspective refers to a viewpoint of putting cities as parts of a network across nations. In relation to the city growth, the spatial perspective primarily discusses city development in the context of economics, geography and economic geography.

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1 Place is a unique and special location in space notable for the fact of human beings occur there (Pacione, 2005).

In the previous chapter, literature related to city growth theory was considered to dynamically develop over time. For two recent decades, the trend of city growth theory has dealt with the issue of globalisation that has led to global networks amongst cities in the world. It has also driven trans-national, inter-city relations. One major reason for this network emergence is economic interest. Derudder et al. (2010) argue that the appearance of the globalisation effect is manifested by the presence of world-wide multinational manufacturer branches. This phenomenon is also supported by the ease of communication technology. With a specific motive, these manufacturer branches have increased jobs opportunities and boosted the economy in which the branches are located.

4.4. Role of transport

Historically, transportation has played a major role in spatial growth and development. To begin, early cities with geographical advantages such as having waterways (an initially simple transportation method) grew as big cities (Shafer, 1977; Nas, 1986).

City development has a close relationship with transport development. According to Banister (1995), there are two positions of transport development in the emergence of city development: passive and active. Passive transport happens when transport development (i.e. infrastructure provision) follows the development of the city. It deals with growth whether in new or existing activity in the city area. On the other hand, transport becomes an active factor in city development when transport infrastructure provision promotes and leads to the growth of activities and land use i.e. ribbon development process.

Basically, both types of transport play a role in shaping city structure. This has previously been formed by transport linkage between places connecting one activity with others. The easy connection between different places affects city growth. Moreover, transferring information, money and goods between different places through transport connection generate some changes that also indicate the growth of a city. In the city expansion process, the centre of activity offers labour demand which represents the economic existence whilst the supply of labour is located surrounding the centre (Burger et al., 2011; Capello, 2011). The city growth process mentioned previously expresses some processes behind city structure formation. It refers to the

divergence and convergence process that is generally influenced by the existence of centre growth which is identified in later sub-section: city/region type.

4.5. The role of city planning

Planning of a city, at an urban or region level affects human life, people's behaviour and culture. From time to time, the development of technology and city/urban/regional planning develop in accordance with people's needs. Later, the structure and formation of the city as a result of a city's plan affects the life pattern of people who live in it.

Throughout city planning, some possibilities in city growth can be anticipated. In its development, city/urban/regional planning intends to sort some problems as stated in City Reader:

> …modern planning is a direct extension of the ancient and pre-modern models: imposing order on nature for the health, safety, and amenity of the urban masses, for the political benefit of the urban elites, and for a way of expressing each culture's highest spiritual ideals….Modern planning operates, by and large, in a politically and economically pluralistic environment, making every alteration of the physical arrangements of the city a complex negotiation between competing interest. And the practice of modern urban planning also takes places at a stage of human development when the planner's defining goal is no longer merely to impose human order on nature, but to continuously impose order on the city itself (LeGates and Stout, 2011).

In the city growth process, city planning is distinguished into two types: planned and unplanned. Both types refer to formal and unpredictable planning to differentiate between planned and unplanned cities. The difference lies in the supervision and control of the implementation of the plan. Meanwhile, currently, the development of most cities is based on planned cities. Some city plans are implemented as stated in the plans, while some other cities do not have any strict implementation as to what is stated in the plan.

4.6. Other causes of growth

There are other causes of growth besides the three previously mentioned criteria that trigger the process of city growth, for example, are institutional, human capital, and specialisation-diversity. A good institution drives a good vision of city development. A well-planned city also comes from a good institution. In democratisation terms, a good institution encourages the distribution of city growth as the presence of regional

representation. Therefore, the institution plays an important role in the city growth process. The second cause, human capital, stimulates the growth of the city through its role in increasing skill, education and technology. A city is a place that provides large opportunities for people to meet and share an idea for knowledge spill-over (O'Sulivan, 2003). Therefore a better human quality, such as education level, promotes a better quality of learning that will also attract firms and activities to come to this place.

Specialisation may lead to growth as it increases productivity - high product volume; the flow of information and materials – interdependency amongst places (Storper, 2010). The increase of information and products are generated by the land-use specialisation and infrastructure availability that cause interdependencies. Specialisation occurs when specific activities geographically concentrate in the same place. It is driven by spatial competition and comparative advantage. Some activities agglomerate in the same place in accordance with transportation costs. On the other hand, comparative advantage is constructed when specific products are concentrated in a place or region with abundant supply.

4.7. Country type

Based on their type of development, countries – in this discussion, are separated into developed countries and developing countries. The first type, developed countries, is relatively more stable than the second one, in developing countries. For developed countries, growth and development are aided by advanced economic, social and political structures (Pacione, 2005). Economic development as a starting point of growth and urbanisation as an impact of growth are both linked together through industrialisation and modernisation. Historically, urbanisation processes in developed countries have started significantly since the industrialisation era began, so that industrialisation then became the starting point of urbanisation. The second type refers to developing countries which are more dynamic than developed countries. This is because of the dynamic progress that has occurred in developing countries. Development of city growth in most developing countries is influenced by colonial periods that provided big effects on several things such as the pattern of linkage between centre-peripheral, morphology and a city's shape and structure. Historically, the development of cities in developing countries has mostly been established as a mix of culture between pre-colonial-indigenous and that of the colonial. The

colonial's effect might have been different over time in line with the colonialist's policy interest. Basically, there are two types of colonial city in relation to the colonialist effect. One of the types is a blended city. The shape of this colonial city type is a blend of colonialist and indigenous culture. Meanwhile, another type depicts the full influence of the colonialist culture on colonial cities, so that those colonial cities have a similar shape and structure to colonial cities, mostly from Europe. These differences later influence the growth pattern in both types of the city which emerge from government policies. Currently, some cities in developing countries, which historically have initially grown from colonial cities, have been developing into modern and global cities (Rimmer and Dick, 2009 p. xvii).

4.8. City and region type

A centre of activities in a city or region is a vital part of the growth process as it functions as a concentration of activities. A centre is usually not only a core of city/region economy but also a place where people can exchange information and ideas. Therefore, a centre plays a role in both attracting people to come and later spreading the growth effect to its area of influence. Since the centre of a city or region is closely related to the connection between people and activities from different places, city/region centres are highly related to the linkage within a city or region.

Regarding the number of centres and spatial considerations, this framework distinguishes between four types of city and region. These types are a monocentric city, polycentric city, monocentric region and polycentric region. Monocentric is literally defined as a city or region with a single or one centre. The centre of the city functions as a core since there is an agglomeration of various activities such as political administration, ceremonial and religious, collection and economic distribution. Its functions trigger the presence of other activities and determine the growth of cities or regions as it initially agglomerates settlements within its area. In turn, the settlements spread to suburbs as a city centre mostly consists of various economic activities. It drives a city structure by a transport network which connects the Central Business District (in the city core) and settlements (in the suburbs), an idea which is depicted in

Figure 4.2. This figure shows the interactions between the core and its suburbs. Interaction between a city centre and its suburbs are then used as one measure to

determine city growth as easy transportation becomes one major factor supporting the city growth process.

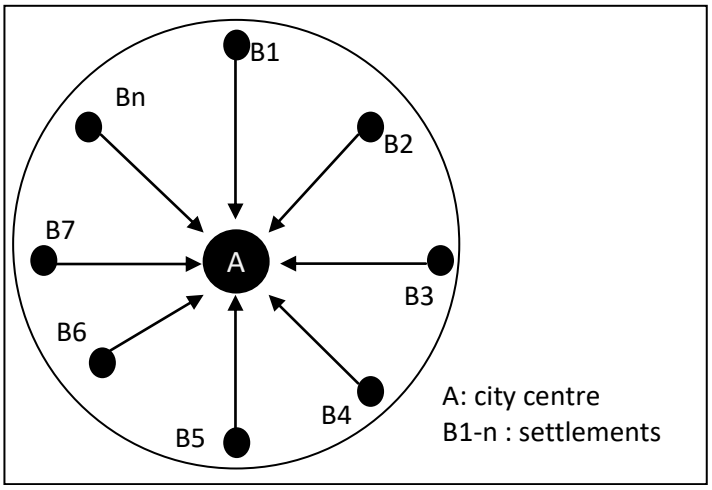

Figure 4.2 A Monocentric City's Movement Pattern

A divergence process could be an explanation behind the occurrence of a monocentric city region type. It is a type of growth process in which the activity or growth is not restricted to the central area. The divergence growth type is shown by the dispersion of growth through the emergence of new centres around the first centre. A central area could be a city-for regional scale or a central business district-for city scale. A city then disperses its growth effects to its areas of influence. The increasing size of agglomeration activities drives congestion which emerges to increase transport cost both for goods and commuting. This condition tends to cause the dispersion of activities from the primary centre to sub-centres. A polycentric city or region is a city or region with multiple centres. The existence of some centres leads to reciprocal links between those centres that are different from the monocentric pattern of linkage. The process of a polycentric establishment can be seen as a convergence growth process. A convergence growth is denoted when growth is centralised in a place. It is a concentration of some activities. Physically, cities with a convergence growth type develop in size due to the increasing land use of areas which are correlated with the rising number of activities within the central area. Therefore, a city with the convergence growth type is represented by a widening of its central area. Regarding the widening central area with the exclusion of the increasing number of activities, enlargement in the population contributes to some extent. The polycentric structure

reduces the main city centre's burden as it decentralises the functions into sub-centres. Several advantages are realised from the polycentric type: reduced traffic congestion, traffic travel time, and financial activities (Bhatta, 2010a). In a polycentric city, each centre or sub-centre has its own function to support city development. Figure 4.3 presents an Indonesian city, Semarang (Central Java), as an example of a polycentric city. Semarang city centres are distinguished based on the level of service coverage. The 1st level service covers the whole city area. The 2nd and 3rd level service cover the levels of areas below. There are transport infrastructure links amongst its centre and sub-centres as a polycentric region refers to the clustering of cities located within close distances. A polycentric region can also be defined as a collection of some cities which are located in adjacent places. The implication of a polycentric region's condition is that it later promotes the varying size of this type of region. Even though there is an interdependence between numerous cities in those specific distances, there is no one city dominating. Each city has its own function. It drives a high interaction amongst cities within the polycentric region area. The interaction appears from economic, people and information flow.

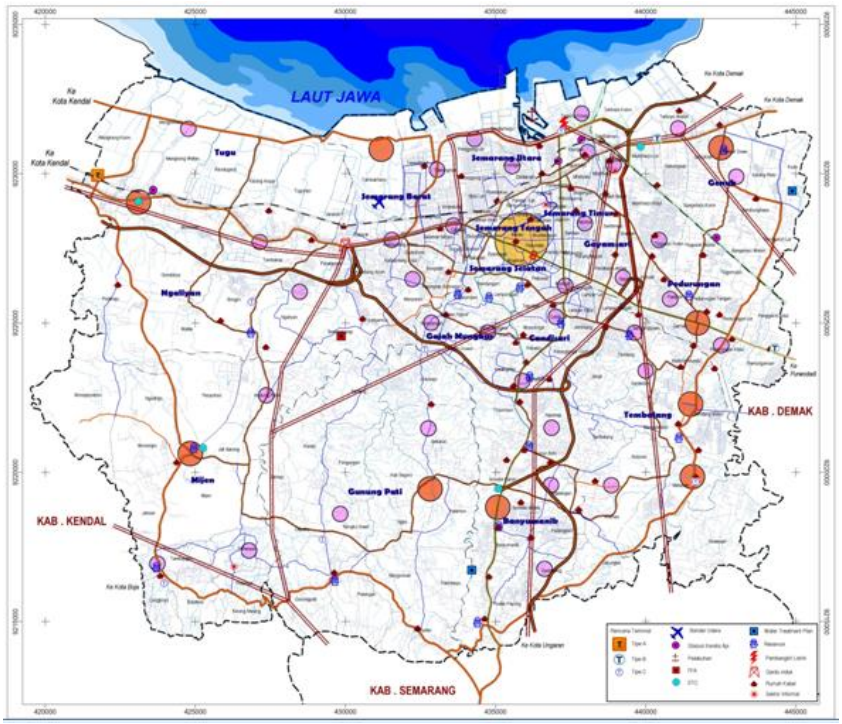

Figure 4.3 Semarang city's spatial structure (Semarang Planning and Development Board, 2008)

4.9. City definitions

Recently, scholars have faced a problem in defining a city since different places have

their own context in classifying what a city comprises. Different nomenclature of population size criteria, delineation of the city boundary, and socio-economy are some examples of those varied classification contexts (Champion and Hugo, 2004). Therefore, in describing a city, a comprehensive set of criteria regarding physical and non-physical characteristic are taken into considerations. Borrowing Bretagnolle et al's statement, a set of criteria used to define a city broadly refers to changes in size and quality (Bretagnolle Fabien and Pumain, Denise, 2001). The size of the city is defined by the increasing number of inhabitants and widening of built-up areas. The population is used to define the growth of cities since it triggers some activities and consumes space in turn. Increasing population is a result of either natural population growth or other complex causes. Natural growth occurs when the rate of birth surpasses that of death. Moreover, growth in population can also be caused by migration. Whilst in terms of quality the city is determined by the quality of life the population – in terms of wealth, health and economic.

Here, population life quality is related to the presence of facilities in the city. Providing more facilities such as trade, health, social facilities than those in rural areas is expected to increase the quality of population life. Furthermore, these facilities also affect migration to the city. On the other hand, population growth is also caused by migration. Increasing the quality of people is also considered to define a city. It is concerned with the relationship between communities or people that construct the social system. Furthermore, it analyses how the social system can occur and generate a causative relationship in the community system.

City economic structure is described as the domination of tertiary economic activities e.g. commercial, service, industries, etc. (Pasaribu, 2005; Bhatta, 2010a). The growth process in a city is also identified by the transformation from primary economic domination into tertiary sectors within the city economic structure. The change includes increasing the percentage of the tertiary sector and decreasing the primary sector’s percentage.

The changing of geographical boundaries explains the physical expansion of the city. Burgess (1967) expresses that the widening of city areas starts from the city centre and he considers the widening area of the city as an invasion of the outer areas. A widening geographical boundary might be used to describe the growth of the city, as a city becomes wide along with the increasing population and their activities.

Settlements and job dispersal to the peripheries are then incorporated by service distributions e.g. in public service, transport, and facilities. City area, in this respect, becomes larger as the new area joins with the former city area (Aguilar, 2003).

4.10. Transport provision

As transport has become a part of everyday life, its growth and development can be investigated from real-life evidence. In this regard, transport provision criteria refer to its function in transporting people and goods from one place to another in accordance with transport infrastructure and transport mode provision.

Accordingly, city growth can generally be described by looking at the development of vehicle ownership and transport infrastructure provision. An increasing number of vehicle ownerships might refer to a widening city area, as people attempt to get to their job location from their settlement area, and economic growth will follow the increased per capita income. As a city becomes larger, its transport infrastructure explains the growth of the city, as it in some ways influences the increasing mobility of people.

The development of transport represents economic growth. Some transportation elements have been constructed as influential factors in the city growth process. This is because their presence influences city development. The elements, as mentioned previously, are transport infrastructure provision – i.e. land road provision, railway provision, water transport and air transport, transport mode, increasing vehicles ownership. Development of transport infrastructure will ease mobility amongst places and activities. Therefore, in the subject matter of transport provision two sub-criteria are taken into account; vehicles ownership and transport infrastructure provision.

4.11. City characteristics

The city characteristics criteria refer to the descriptions of the growth of a city based on its characteristics. In this regard, there are some points to be considered. In describing city growth there are broadly three different sub-criteria that refer to potential resources which enhance growth of the cities: (1) geographical position, (2) facilities provision and (3) people characteristics.

Regarding geographical position, cities are distinguished into coastal cities and inland cities. This distinction affects the city's initial growth. Coastal cities are usually

exposed areas that grow faster than inland cities. This more rapid expansion is in accordance with their easy access and connection to other places as they have access to water transport. The enlargement of coastal cities is shown by the great socio-economic changes brought about by the emergence of coastal migration. Coastal cities also show dynamic growth due to their development potential and this can be indicated by the varied different population structures within their demographic pattern. Furthermore, city growth is also characterised by infrastructure provision.

4.12. Concluding remark

In this chapter, a framework table has been created using two considerations: disciplinary views and subject matters in accordance with empirical experiences in the city growth process. The discourse related to city growth from seven disciplines was considered.

Synthesising a number of discussions and thoughts from different disciplines and journal papers into a certain number of criteria became a challenge in its process. It was undertaken by collecting the same basic thoughts in many discussions and sorting them to generate criteria. These criteria would have been very helpful in understanding city growth evolution from several perspectives. Moreover, the complexity of city growth leads also to a sub-criteria generating process. The sub-criteria will then accommodate different discourses in the growth of the city regarding land use and transport development.

In order to apply the approach using the classification table, a number of articles will be analysed in-depth and used to populate in the table. This will be discussed further in the next chapter.

Chapter 5: An Analytical Review of Disciplinary Approaches to Understanding City Growth

5.1. Introduction

As mentioned in chapter four, numerous possible sets of criteria can be created from the classification framework. This chapter applies the framework by completing the classification table with some paper examples.

Moreover, this chapter aims to analyse articles about the growth of cities from varied perspectives. Based on the framework created in chapter two, a number of articles from seven disciplinary backgrounds - transport studies, economics, geography, economic geography, urban planning, history and sociology, are taken into account. Firstly the analysis groups the articles into their disciplinary perspectives from the journals on which they are published. In this regards, the framework table from the previous chapter is used to help.

Relevant articles are taken into account in this research in order to understand the findings of their discussion. The discussion in a particular paper represents the disciplinary perspective which it is concerned with. However, since reviewing all of the articles from these disciplines is beyond the scope of this thesis, relevant articles are picked up under the following considerations.

- Articles that concern city growth and discuss, either implicitly or explicitly, land use or transport development.
- Articles that summarise the evidence and help to explain apparently different results among studies addressing the same question

The preferred articles are those which are published after the 1980s due to the dynamic view of the city approach that has emerged since the 1980s (Glaeser et al., 1992; Scott and Storper, 2013). Other criteria for the chosen paper follow some rules mentioned previously in chapter three.

At the end of this chapter, the classifications of considered criteria from different perspectives are expected to be set. They will be acquired by analysing and comparing between disciplinary groups. The understanding of discipline-perspective

concentrating on city growth theory help to elucidate the historical facts of the relationship between land use and transport development which is shaped by past evidence discussed in the next chapters.

The structure of this chapter is as follows. Sub-section 5.2. – 5.8 analyse the criteria concerned from selected papers in each disciplinary groups. Sub-section 5.9 describes the map of each perspective that determines a combination of criteria in each discipline. Sub-section 5.10 presents the conclusion to the chapter.

5.2. Transport studies

Table 5.1. summaries a number of articles that are reviewed in the transport studies area. The transport studies perspective mentioned in chapter two is concerned with the movement of people and goods. This discipline involves many different elements that influence each other. In this way, transport studies overlaps with some other disciplines.

Table 5.1 Classification table from transport studies perspective

No	Criteria	Disciplinary views				Subject matter				
	Scholars	Spatial perspective (A)	The role of transport (B)	The role of city planning (C)	Other causes of growth (D)	Type of country (E)	City/regional type (F)	City Definition (G)	Transport provision (H)	City characteristic(I)
1	Bowen (2000)	A4	B1	C2	D1	E2		G3	H2	I2
2	Meyer (2000)	A2	B1	C2	D1	E1		G1& G3	H1& H2	I2
3	Gwilliam (2003)	A1	B2	C1	D1	E2		G1 & G3 & G4	H1	I2
4	Morichi (2005)	A2	B1	C1	D1	E2	F2	G1& G3 & G4	H1& H2	I2

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (A)	The role of transport (B)	The role of city planning (C)	Other causes of growth (D)	Type of country (E)	City/regional type (F)	City Definition (G)	Transport provision (H)	City characteristic(I)
5	Kishiue (2005)	A1	B1[2]	C1	D1	E2	F2	G1& G4	H2	
6	Buchanan et al. (2006)	A1	B2	C1	D1	E1	F2	G1 & G4	H2	I2
7	Graham (2007)	A2	B1	C2	D1	E1	F4	G1&G 3 G4	H2	I1
8	Patarasuk (2013)	A3	B1	C2	D1	E2		G3	H2	
9	Wachs (2013)	A3	B1	C2	D1	E1	F4	G1& G3& G4	H2	I2
10	Deng et al. (2014)	A3	B1	C2	D1	E2		G3	H2	I2

Sub-criteria:

Spatial perspective (A)
A1 : Autonomous
A2 : Mega urban
A3 : Regional
A4 : Global

The role of transport (B)
B1 : Transport drives the city growth
B2 : Transport is an effect of city growth
B3 : Transport is neither considered as a cause nor an effect of city growth

The role of city planning ©
C1 : City planning drives the city growth
C2 : City planning is not explicitly considered as a causal factor

Other causes of growth (D)
D1 : Institution and Government policy
D2 : Human capital

Type of country (E)
E1 : Developed country
E2 : Developing country

City/regional type (F)
F1 : Monocentric city
F2 : Polycentric city
F3 : Monocentric Region
F4 : Polycentric region

City definition (G)
G1 : Population
G2 : Life quality
G3 : Economic
G4 : Geographical boundary

Transport provision (H)
H1 : Level of vehicle ownerships
H2 : Transport infrastructure provision

City characteristic
I1 : Geographical position
I2 : Facilities provision
I3 : People characteristic

5.1.1. Spatial perspective

Some scholars concerned with mega-urban in spatial perspective in Table 5.1 argue

that movement across places cannot be constrained into a single city. It corresponds to the perspective of a continuous urban area reflecting connections between cities. In this regard, the city-region represents a group of territories consisting of multiple urban cores, extended suburban, and widely-ranging hinterland areas (Pike et al., 2006; Scott and Storper, 2007).

In certain spatial perspectives, the growth of the city is seen as autonomous. The city is considered to be self-contained with a distribution function in the entire city sub-area (Kishiue, 2005). Performing its function, each sub-area supports city development. A city system integrates each sub-area to hold overall development within the city.

In his paper, Morichi (2005) states that mega-urban development significantly contributes to economic development. It is argued to be an engine of growth for its covered area in an early stage. Growth of urban activities and infrastructure provision in this area brings economic externalities to other smaller cities. In its development process, the mega-urban area provides a good link between places to ease accessibility and mobility.

The articles also discuss the development of the region and its role in transport development. Meyer (2000) and Wachs (2013) describe evidence of this issue in the US that could possibly occur in other places. They explain urbanisation in terms of a widening urban area growing as an effect of transport development, whether from transport policies, transport technology development or transport infrastructure. Regional development promotes transport development due to the increasing urbanised areas. As places become urbanised, transport is encouraged to have more capacity in moving people and goods within the region. However, these two scholars do not recognise the association between economic growth and transport provision. This association is determined by Graham (2007). He finds that transport investment growth describes the correlation between productivity and transport investment.

5.1.2. The role of transport

From the transport studies perspective, transport has an important position in generating city growth. Transport drives the appearance of new centres which then triggers wider development and urbanisation. Transport promotes the easy

accessibility of getting from one place to another. The more accessible the place, the more possible it is to grow since transport provides opportunities for many types of agglomeration[3] (Wachs, 2013).

Transport development demonstrated by transport infrastructure and system management improvements aims to encourage advancing the development of the city (Kishiue, 2005; Wachs, 2013). Furthermore, Patarasuk (2013) mentions land-cover changes as a result of the transport role through road availability. Accessibility and mobility are created through road infrastructure that contributes towards city development and modernisation. Easy of mobility and accessibility is indicated as a primary factor in the establishment of transport efficiency.

Moreover, Morichi (2005) explains that an efficient transport system is a key factor in creating better liveability in the city. The presence of transport reduces the economic disparities amongst places. In this respect, transport then generates increasing income due to the ease of access between different places. In fact, transport infrastructure constructs city pattern and structure. Therefore, transport infrastructure is also considered for future city development.

On the other hand, Gwilliam (2003) argues that transport is a supporting factor in the growth of the city. Transport provision follows the need for movement and mobility in urban development. Hence, transport is needed to serve in the widening of the urban area. A good transport system then, Gwilliam adds, accelerates the city growth process. In accordance with transport's position in city growth, Buchanan et al.'s (2006) perspective are on how land-use forms transport patterns in a particular city. Furthermore, Buchanan explains that different land use generates movement and mobility.

5.1.3. The role of urban planning

Basically, planning is an important tool to support the development of an area as it guides its direction of growth and development (Kishiue, 2005). With regards to transport development, Kishiue (2005) presents that transport planning – besides

[3]Wachs mentions that transport infrastructure give opportunities for many type of activity-from economic to social, to gather in a particular place.

standing as an independent planning approach, is a part of wider, comprehensive planning in city planning documents. Furthermore, city planning addresses specific transport infrastructure requirement which meets the need of the city to develop. Hence, planning not only provides for demand but also directs city growth and anticipates future possibilities.

Gwilliam (2003) presents an important role in urban and city planning in increasing city growth. He mentions one factor in the unsuccessful boosting of city growth is ineffective planning. This refers to the failure of integrating the private system with comprehensive planning and strategy. On the other hand, an integration between factors participating in the growth of the city through comprehensive planning help to structure the city and boost its growth.

5.1.4. Other causes of growth

Most papers in the above table consider the institution as the cause of city growth. This refers to the role of government policies and governance institution in directing the growth of the city, especially in developing city transportation. As transport experts mostly believe that transport affects and generates the development of the city, the government policies tend toward regarding transport infrastructure development, land use growth direction, and economics as factors in the growth of the city.

Government policies that allocate and spread growth from the dense city centre area obviously generate urbanisation through creating new centres of activities. Morichi (2005) presents one factor that causes the emergence of the mega-urban area government policy which contributes towards industrial development. This obviously cannot be created in the centre of the city. Therefore, along with the aim to provide jobs to the peripheral inhabitants, the development is spread to the hinterland.

5.1.5. Type of country

Two different types of countries have their own experience in coping with transport issues. Developed countries are seen as having a mature transport system in accordance with an efficient system applied (Meyer, 2000). Developing countries mostly experience rapid motorisation and congestion in their big cities. An increasing number of motorcycles is an important topic that usually relates to a bad public

transport service and economic purpose (Meyer, 2000; Morichi, 2005).

Regarding the developing countries, Morichi (2005) presents another problem to be faced regarding the provision and the big gap between arising demand and infrastructure supply. In detail Gwilliam (2003) argues that the issue of infrastructure provision occurs since the country cannot adjust the population spreading beyond the city's geographical boundary. Increasing population distributes people to the outskirts of cities which can then be followed by infrastructure provision. This infrastructure demand relates to the dynamic changes in developing countries and also characterises the growth of the cities in this country type, besides the increasing population. In respect to transport, they discuss the need for a dynamic transport system. Referring to Morichi's statement, developing countries mainly in Asia are facing an emergence of megacities as an urbanisation characteristic. The rapid urbanisation in Asian developing countries grows faster than those that appear in developed countries on the same level. A consequence following this phenomenon is a huge demand for infrastructure to fulfil people's needs, especially in megacities.

The transport system in developing countries' cities requires an immediate solution since it develops rapidly following the development of the city pattern. These mentioned conditions obviously create problems in the growth of cities, regarding transport development. In order to overcome the emerging problem, Morichi proposes a scheme that considers the staging of solutions. The idea is to solve the problem with actual and practical solutions concerning the long term scenario.

5.1.6. City/region type

Looking at Morichi's (2005) research, he states that most Asian megacities started growing with one centre (monocentric). City activities that provide private and public jobs accumulated in the city centre with settlements located in the peripheral area. This city structure generates commuting from settlements to the city centre and vice versa. In turn, the density and busy activities in the centre then drive deterioration i.e. environment, transport, quality of life. It is a solution with respect to the poor city centre condition when governments build road infrastructure to the peripheries. One of the aims is to spread the dense activity to its country-side. Therefore, a polycentric city is then created since there is a decentralisation of business and government activities into the sub-centres. Although each centre shares the function of growth,

they still connect through an interdependent relationship. Furthermore, regarding Kishiue's (2005) perspective, a polycentric city also aims to distribute some function in whole city sub-areas. Distributing some of the functions is expected to deliver the growth effect to the whole city area.

5.1.7. City definition

The growth of the city is defined by economic growth, as indicated by an increase in GDP. Some of the papers in table 5.1. contain an interesting discussion regarding transport's position as the engine of economic growth. They argue that transport makes movement easier. This condition then generates and develops economic activities that in turn affect increasing.

Other articles show the combination of the economy and population level to define a city. According to Meyer's (2000) argument, there is a population in a specific place which tends to grow over time in combination with economic development. It is clearly mentioned that population growth is a consequence of the attraction to the economic activities in the city. City in-migration is a factor that contributes to an increasing population alongside the natural population growth. Regarding population and economy, Morichi (2005) defines that the growth of the city area is indicated by the emergence of urbanisation through the spreading of economic activities to the countryside. The spreading of activities is then followed by population distribution. The industrial investment in the mega-urban area is supported by an efficient transport system.

Gwilliam (2003) explains the growth of the city using the changes in the city area. One reason why the area containing urban activities becomes wider, in geographical boundary terms, is the rapid growth of population. City in-migration is a big burden to the city centre. Therefore, the development of outstrips will reduce activities in the city centre and also provide job opportunities. In turn, this distribution is followed by transport infrastructure provision connecting the centre with the sub-centre. Furthermore, in defining the growth of the city there is a correlation between economic activities, population, and the widening geographical boundary. Economic activities gather in a particular place and generate an agglomeration benefit, e.g. reducing transport costs, and external economies.

Kishiue (2005) defines the growth of the city using an increasing population and a widening geographical boundary sub-criteria. Transport infrastructure development in this regard generates the growth of the city through those two elements. Transport infrastructure is argued to be the leading factor since it drives modernisation and development.

5.1.8. Transport provision

Transport provision, especially in transport infrastructure, plays a part in the growth of the city. The presence of transport commonly influences many aspects of city life. Graham (2007) states that transport provision has implication for the growth of the city. Furthermore, this implication can be found on increasing the density of manufactures. It will then affect the growth of the city in economic-money flows, and city size-since there are many more places of greater accessibility.

However, Morichi (2005) found that most Asian cities have a scarcity in transport infrastructure supply. This fact has consequences for the growth of cities. More growth is only found in big cities – which commonly have more infrastructure supply compared to small and medium cities. Therefore, there is a slight difference in how transport plays a role in city growth in developed countries and developing countries in Southeast Asian countries on the other side. As mentioned previously, transport provision in developed countries tends to at least keep the growth at a specific level. On the other hand, transport provision in developing countries is a base in generating city growth. Beyond these conditions, the provision of transport in the growth of the cities leads to the creation of lower economic costs.

Gwilliam (2003) mentions in his paper that the growth of the city is characterised by increasing vehicle ownership. Using some developing country cities as his case studies, he explains that most of those cities are struggling with a huge number of motorcycles. One positive thing is this increases the level of private mobility that, in turn, promotes city development. However, the amount of motorcycles, together with increasing car ownership, deteriorates the environment with fuel emissions and generates congestion.

5.1.9. City characteristic

Reviewed articles in Table 5.1 characterise the cities in accordance with geographical location or facilities provision. Regarding the geographical position, Patarasuk (2013) notes that the initial role of transport in the growth of cities in the hinterland area is to provide access from agricultural areas to the local market. However, other articles that characterise the cities in term of facilities provision describe that the presence of facilities in cities raises their attractiveness. Facilities provision in cities attracts in-migration since the presence of facilities in the city creates jobs (Morichi, 2005).

5.2. Economics

In order to understand the in-depth perspective of some economists, some papers from economic journals are taken to illustrate the varied perspectives in accordance with the growth of the cities. The considered criteria of those papers are presented in Table 5.2.

Table 5.2. Classification table from economist perspective

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (A)	The role of transport (B)	The role of city planning (C)	Other causes of growth (D)	Type of country (E)	City/regional type (F)	City Definition (G)	Transport provision (H)	City characteristic(I)
1	Palivos and Wang (1996)[4]	A1	B1	C1	D2	E1	F1	G1& G3		I1
2	Eaton and Eckstein (1997)	A1	B1	C2	D2	E1		G1& G3		
3	Black and Henderson (1999)	A1	B3	C2	D2& D3	E1	F1	G1& G3		
4	Dick (2000)	A4	B1	C2	D1	E2	F4	G3	H1& H2	I1
5	Duranton and Puga (2000)	A3	B1[5]	C2	D1& D3	E1	F4	G3& G2	H1[6]	

[4] The journal from where this article is taken – Regional science and urban economics journal, is a journal that emphasises on microeconomic analyses of spatial phenomena.

[5] It is represented on a discussion about how movement between places is related with up and down of city size (see page 537).

[6] It is stated as congestion

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (A)	The role of transport (B)	The role of city planning (C)	Other causes of growth (D)	Type of country (E)	City/regional type (F)	City Definition (G)	Transport provision (H)	City characteristic(I)
6	Sharma (2003)	A3[7]	B3	C2	D2	E2		G1& G3		
7	Shapiro (2006)	A1	B3	C2	D1& D2	E1		G2& G3		
8	Rossi-Hansberg and Wright (2007)	A1	B2[8]	C2	D2	E2	F1	G1& G3		I2
9	Duranton (2008)	A1	B3	C2	D1& D2& D3	E2	F1	G1& G3		I2
10	Cuberes (2009)	A1	B3	C2	D2	E1		G1& G3		I2

Sub-criteria:

[7] Region view is not explicitly stated in this article, but the author discusses a city in its relation with other cities.

[8] Rossi-Hansberg and Wright do not mention clearly with regard to transport role in the growth of the city. It is only marks that the emergence of activities and job opportunities in the CBD encourage people to travel to get it and generate the commuting cost.

Spatial perspective (A)	***Other causes of growth (D)***	***City definition (G)***
A1 : Autonomous	D1 : Institution and Government policy	G1 : Population
A2 : Mega urban	D2 : Human capital	G2 : Life quality
A3 : Regional		G3 : Economic
A4 : Global		G4 : Geographical boundary

The role of transport (B)	***Type of country (E)***	***Transport provision (H)***
B1 : Transport drives the city growth	E1 : Developed country	H1 : Level of vehicle ownerships
B2 : Transport is an effect of city growth	E2 : Developing country	H2 : Transport infrastructure provision
B3 : Transport is neither considered as a cause nor an effect of city growth		

The role of city planning ©	***City/regional type (F)***	***City characteristic***
C1 : City planning drives the city growth	F1 : Monocentric city	I1 : Geographical position
C2 : City planning is not explicitly considered as a causal factor	F2 : Polycentric city	I2 : Facilities provision
	F3 : Monocentric Region	I3 : People characteristic
	F4 : Polycentric region	

5.2.1. Spatial perspective

Most of the paper examples used in table 5.2. concern autonomous growth in accordance with the spatial perspective. The scholars of these articles argue that the growth of the city is generated by their economic growth (Palivos and Wang, 1996; Eaton and Eckstein, 1997; Black and Henderson, 1999). Cities are places that develop because of their economic resources. The development of the cities is also supported by their role in centralising economic activities. Moreover, centralised economic activities then generates interaction across activities, creating benefits.

The first two previously mentioned papers argue that the growth of internal economies will then create a spill-over of human capital. This, in turn, generates interdependence and connectivity between cities. Meanwhile, Palivos and Wang (1996) give slightly different thought regarding positive externalities as also discussed by Duranton (2008). It is mentioned that the growth of the city, which comes from local economic growth, develops the externalities which strengthen the growth of the city. These three papers also state how growth affects urbanisation patterns and how urbanisation drives the growth process efficiently.

With regards to the regional perspective, economist scholars in the table state that the regional perspective appears historically to bridge the gap between national and local perspectives. Cuberes (2009 p. 2) states cities grow sequentially, with big cities initially growing for some periods, followed by smaller cities. It points to big cities experiencing the deteriorating quality of life which generates capital flow from big cities to smaller cities. Nevertheless, the growth of cities refers to economic entities as the main necessary elements which affect the changing of city size. Furthermore, capital flow leads labour to come to smaller cities. The growth process is as explained below:

> …each city experiences a solo growth until it reaches a critical size. After this happens, the initially second largest city is the one that grow alone (Cuberes, 2009 p. 12).

Duranton and Puga (2000) state that in the regional perspective, cities connect each other within a region. Accordingly, there is economic interaction amongst cities based on the interdependence relationship.

5.2.2. The role of transport

Palivos and Wang (1996) postulate that one of the generating factors in city growth is transport infrastructure provision. Existence of transport infrastructure stimulates and pushes the emergence of two important forces in the city growth process, namely centrifugal and centripetal forces. Through transport infrastructure, some economic growth features could be both converged and diverged. Centripetal force encourages agglomeration which in turn strengthens growth of the city through knowledge spill-over. Furthermore, the presence of transport infrastructure initiates a centrifugal force that makes growth of the city unbounded.

5.2.3. The role of urban planning

In discussing the causes of growth, most of the paper examples in Table 5.2. do not focus on city planning as the causal factor. Therefore, those papers disregard the role of city planning in determining the growth of the cities. Instead of city planning, the authors remark on the influence of economic development in defining the city growth direction. Accordingly, the discussion about growth of the cities refers to how the economy drives and affects the growth of cities instead. Regarding the autonomous development perspective, growth is led by endogenous economic growth and

exogenous population growth (Black and Henderson, 1999; Shapiro, 2006; Rossi-Hansberg and Wright, 2007). Economic growth refers to both efficiency growth and reducing inequity in income. The economic effect can generate the agglomeration of economic activities which in turn attracts people to migrate to the city. In this regard, Black and Henderson (1999) argue that population-migration to the cities develops the growth process through human capital. Furthermore, considerable growth emerges not only in individual cities but also in the increasing number of emerging new cities.

5.2.4. Other causes of growth

Shapiro (2006) argues that two-third of the growth of the city due to human capital influences on productivity and one-third due to the enhancement of quality of life. Human capital is seen as an important factor in city growth by its role in increasing skills, education and technology.

Palivos and Wang (1996) have a similar assumption regarding the position of human capital in the city growth process to Eaton and Eckstein (19970. They broadly state that human capital stimulates and generates the growth of the city. An agglomeration of many activities in a city centre attracts people to jobs. Palivos and Wang describe enhancement knowledge as a consequence of those gathered people as an uncompensated spill-over. People can get freely available knowledge in the activity centre. Furthermore, human capital availability becomes the reason for the gathering of economic activity in the city centre. They both then assume uncompensated spill-overs of knowledge as the main engine of sustained growth (Palivos and Wang, 1996 p. 646). Whilst Eaton and Eckstein say:

> ….in which urban growth is driven by the acquisition of human capital. Observers of urban development have emphasised the role of human capital in the functioning of cities (Eaton and Eckstein, 1997 p. 444).

On the other hand, Black and Henderson state the contrary. They mention that knowledge spill-over augments returns to private human capital accumulation and drives long-run endogenous growth (Black and Henderson, 1999 p. 253).

The interconnection between cities and their growth generates a relationship between them. This then forms a system that drives a large interaction between people and migration (Eaton and Eckstein, 1997).

On the other hand, to increase the growth of cities there is also a need for product specialisation. Rossi-Hansberg and Wright (2007) argue that product specialisation might reduce economic cost.

5.2.5. Type of country

Table 5.2. above, presents two types of countries the authors are concerned with. Most authors in the table concern themselves with the growth of the city in developed countries. Referring to their discussion, industrialisation has been positioned as an initial growth mechanism. It becomes the reason for economic agglomeration in a city (Black and Henderson, 1999). The industrialisation that commonly occurs in a city attracts economic activities to agglomerate. It is a consequence of the existence of agglomeration activities in a city becoming a trigger of population migration to the city.

In the same argument but differently termed, Eaton and Eckstein (1997) note that in attracting activities and agglomeration, a city needs to be provided for by infrastructure. The available infrastructure in a particular area is needed by economic activities to run its operations. Furthermore, the gathering of greater amounts of economic activities will then decrease their economic cost.

5.2.6. City/region type

From city development history, the initial city grew as a monocentric city. The centre is the site that has more potential than others in attributes including location, social life or economic activities. Primary activities of the city occur in a single given site whilst others are located outside. This single given centre approach is also used by Black and Henderson (1999) to examine the growth of the city referring to the commuting flow and population increase.

The city evolution, in turn, pushes the appearance of new centres. In an unplanned city, the number of centres generally affects the road pattern within a city or region. In planned cities, the numbers of centres and road patterns have been designed already. The emergence of a new centre is an effect of economic and human capital spill over from the initial centre.

From their discipline perspective, some economists argue how the city with a single centre develops. Palivos and Wang (1996) state that growth initiates from an effective organisation for economic activities in a primary centre. The central growth is generated from its local economy. In turn, growth of the centre affects centripetal force which encourages agglomeration.

As the growth of the city can be seen from a regional perspective, when it involves some cities growing in a region then it is called a polycentric region. Polycentric region cities play a role in creating new cities and also promotes the existing cities to grow in a region (Eaton and Eckstein, 1997 p. 445). Furthermore, these scholars state that the growth of cities is parallel as an outcome of urbanisation.

5.2.7. City definition

Economists in the table above generally define a city from Populations and economic metric. Defining a city by its population relates to the size of the city. Growth of the city in this regard is indicated by growing levels of the population. The population is used to meet city criteria, as population levels correlate with a number of activities. Whilst city definition in regard to the economy is correlated with the city characteristic, productivity growth and concentration of human capital (Shapiro, 2006), this broadly refers to how these possible correlations generate economic growth.

One positive link between population levels and economic growth is found in the spill-over effect. This effect is expected to occur in relation to life quality. The educated population is a source in generating spill-over effects. It is said that greater population size enlarges the spill-over of knowledge, which is human capital and induces externalities.

Another definition of the city is stated by Sharma (2003) who determines the city from its population. She shows that population defines the size of the city. It is said that the growth of the city obviously relates to city size. Therefore, city size is historically influenced by its evolution. Moreover, the population of the city in a given time is affected by events occurring in city history. Sharma presents an in-depth view that the growth of the city is a manifestation of the ability of a city to provide economic activities for its population. Therefore, the larger the population, the greater the

growth of a city.

5.2.8. Transport provision

Transport provision is closely related to the ease of mobility and accessibility. Growth of economic activities in a particular city is promoted by the existence of transport infrastructures that connect between activities. Moreover, providing transport infrastructure is a remarkable factor to reduce economic cost which is a required condition of agglomeration activity (Dick, 2000). Accordingly, the transport provision contributes to economic changes as it is an important factor in supporting economic activities. Furthermore, following the role of transport infrastructure in generating economic growth, Duranton and Puga (2000) state that the level of vehicle ownership could reflect the economic condition. In this regard, the level of vehicle ownership could also represent dynamic activity since it depicts mobility as mentioned before. Moreover, vehicle ownership also relates to increasing income as it plays a role in people's economic activity.

5.2.9. Characteristic of the city

A city beginning to grow from a single point is a common occurrence. In relation to this, favourable geographical conditions determine the location of first growth. In turn, geographical location also affects the process of growth itself (Palivos and Wang, 1996; Kishiue, 2005). The strategic geographical position leads to ease of mobility and flow of goods and information. However, Ottaviano and Puga (1998) argue that agglomeration can occur anywhere as long as people encourage it to happen.

In accordance with infrastructure provision, agglomeration of economic activities is focussed on a specific area which has better availability of infrastructure as it plays a role in firm viability (Kelley and Williamson, 1987; Rossi-Hansberg and Wright, 2007). Indeed, this is related to efficiency and amenity. Furthermore, the provision of infrastructure will lead to decreased economic costs of production.

5.3. Geography

The classification Table 5.3 is completed with some different academic papers which

inform on the geographers' perspective. They obviously have varied views on the growth of the city. The differences between those academic papers are highlighted across a wide range of sub-criteria.

Table 5.3. Classification table from geographer perspective

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (A)	The role of transport (B)	The role of city planning (C)	Other causes of growth (D)	Type of country (E)	City/regional type (F)	City Definition (G)	Transport provision (H)	City characteristic(I)
1	Ford (1993)	A3	B3	C1	D1	E2	F4	G1		I1
2	Amin and Graham (1997)	A4			D1	E1		G3		I2
3	Ford (Ford, 2000)	A3	B1	C2	D1	E1	F4	G1& G3	H2	I2
4	Cheng and Masser (2003)[9]	A2	B1	C1	D1[10]	E2	F2	G3	H2	I2
5	Cohen (2004)	A1& A3	B1	C2	D1	E2	F4[11]	G1& G2& G3		I2
5	Zhang et al. (2013)	A3	B1	C1	D1	E2		G1& G3 & G4	H2	I2
6	Brown (2014)	A2	B1	C1	D1	E1	F4	G1	H2	I2

Sub-criteria:

[9] The journal where this article is picked up involves the mobilisation of many disciplines: geography, economics, environmental science, political science, demography, engineering, and regional science, for example—and many different strategies of work

[10] It is said that a good implementation of urban planning will be done by a good institution

[11] The article does not clearly mention the polycentric region but it discusses such a region with more than one centre.

Spatial perspective (A)	***Other causes of growth (D)***	***City definition (G)***
A1 : Autonomous	D1 : Institution and Government policy	G1 : Population
A2 : Mega urban	D2 : Human capital	G2 : Life quality
A3 : Regional		G3 : Economic
A4 : Global		G4 : Geographical boundary
The role of transport (B)	***Type of country (E)***	***Transport provision (H)***
B1 : Transport drives the city growth	E1 : Developed country	H1 : Level of vehicle ownerships
B2 : Transport is an effect of city growth	E2 : Developing country	H2 : Transport infrastructure provision
B3 : Transport is neither considered as a cause nor an effect of city growth		
The role of city planning ©	***City/regional type (F)***	***City characteristic***
C1 : City planning drives the city growth	F1 : Monocentric city	I1 : Geographical position
C2 : City planning is not explicitly considered as a causal factor	F2 : Polycentric city	I2 : Facilities provision
	F3 : Monocentric Region	I3 : People characteristic
	F4 : Polycentric region	

5.3.1. Spatial perspective

Certain academic papers in Table 5.3 show a varied spatial perspective. It can be seen that some of them have a mega-urban region perspective.

Consistent with an economist perspective, geographers are concerned with location and space in their view of city growth from a regional perspective. They are concerned with causative cumulative interactions amongst place in a region (Storper, 2010). Big cities' growth affects smaller cities growth in spatial geography.

Dynamic global development, which is influenced by the development of technology and ease of communication amongst countries, leads to fostered growth of cities. Furthermore, Cohen states:

> Increasingly, urban growth is being influenced by global economic integration and the struggle for countries – and indeed individual countries – to be competitive in the marketplace (Cohen, 2004 p. 24).

However, within regard to wages, globalisation still does not have a massive effect in

reducing the wage gaps between countries, as it provides more economic instability[12].

5.3.2. The role of transport

The presence and development of transport infrastructure encourages an extended city area and indicates city growth. Cohen (2004 p. 66) researches developing countries, stating that some innovations in transport and telecommunication play a role in the spread of city functions over a geographical area. The spread of city functions then drives a widening area which is seen from a city's administrative boundaries. In this respect, transport is a leading factor in causing urban expansion (Cheng and Masser, 2003). Here, the difference between developed countries and developing countries is how transportation speeds up and spreads growth, respectively.

In contributing towards the growth of a city, Ford (2000) explains the reinforcement of transport infrastructure in the form of city growth direction. In most developing countries, the construction of new road infrastructure generates land use changing along the road. It continues and widens the land cover area (Zhang et al., 2013). Furthermore, the presence of transport plays a role in easing migration with regards to urbanisation emergence in city centres. It then builds greater connectivity between the city centre and its hinterland as a result of transport provision. Concerning growth equity, the ease of connectivity between places is a reasonable solution to reduce the imbalance of growth in a region. Contrasting with the transport role mentioned previously, Ford (1993) shows evidence of Indonesian city development which explains that transport is an effect of land use development. The colonial cities, which are the initial growth cities in Indonesia, grew by separating land use bases for different basic functions. The separate activity locations then drove the transport infrastructure connecting land uses. The same also occurs when new centres develop with new cities or new centre activities generating the construction of infrastructure which in turn generates the growth of modes.

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12 Globalisation is also meant as open border. It makes each country more susceptible to be affected by global economic condition.

5.3.3. The role of urban planning

Some articles in the table above clearly mention the important role of urban planning in generating the growth of cities. The role of city planning in the growth of the city from a geographic perspective is stated by Cheng and Masser (2003) through three important concepts, i.e. probability, density, and intensity. These three concepts refer to the change of land use that is assumed as one of the three signs of growth. Probability is defined as the possibility of land use occurring. Density refers to the density change of land use. The last concept - intensity, is determined as the strength of land-use change that can occur in a planning area. Hence, city planning is placed to determine the city growth direction.

5.3.4. Other causes of growth

An institution is mentioned as a cause of city growth by scholars in the above table. Government policies in facilitating city development-spreading activities concentration and construction of transport infrastructure are mentioned as institutional roles in city growth. Policies with respect to the development of transport such as the construction of railways, roads, airports, and ports obviously facilitate the development of land use, activities, and the economy (Ford, 2000). These are shown by the change of these elements (Ford, 1993). Not different with Ford, Zang et al. (2013) argue that institutions play a strategic role in the growth of cities. This refers to the government policies to support city proximity, i.e. ease of transport and decentralisation. The ease of intra-city transport relates to agglomeration activity in compact city forms, whilst ease of inter-city transport supports connectivity between cities. In turn the ease of transport connectivity is assumed as a dominant factor in the emergence of secondary cities and the new cities.

From the other view of institutions, good governance is also an important factor in the growth of the cities. In relation to this, Amin and Graham (1997) argue that institution is the power of governance to formalise their policies. The institution, moreover, plays a role in stimulating the growth through for example the concepts and decision.

5.3.5. Type of country

Cohen is one of the scholars in Table 5.3 who marks city growth in developing

countries, where urbanisation rates[13] are still the same as those in developed countries during the first quarter of the 20th century. In explaining this phenomenon Cohen enlightens that:

> "…the growth is being applied to an ever-expanding base population, the absolute increase in the number of urban dwellers will be enormous" (Cohen, 2004: p. 32).

5.3.6. City/region type

Polycentric regions that are discussed by Ford (2000) are created by hierarchical central places. The emergence of the lower central hierarchy is a manifestation of the distribution centre's role in serving people. A hierarchical city system can be understood from the spatial scale of organised human activities. The higher the hierarchy, the larger the region that has to be served.

Ford (1993) expresses polycentric region development in some regions of Indonesia. An increasing number of city centres is generated by the growth of the former city centre. Historically, Indonesian cities grow from a monocentric city. Growth of the city e.g. in population, economy, the geographical boundary has led to increasing numbers of city centres. In this regard, the infrastructure (transport) network is positioned as a skeleton of the city. Transportation infrastructure is also utilised in moving goods and people from between land uses.

5.3.7. City definition

Certain geographers in Table 5.3 say that the growth of cities could be measured by population growth or income growth. A city grows as a simple result of natural population increase when the number of births is greater than deaths. In line with the growth of population, suburbs are engaged in non-farm activity and develop into an urban residential area that becomes city areas in turn. Furthermore, the growth rate of the cities could be different across time periods. Rates of growth are indicated by fast growth when it starts from a smaller size, either in natural measurement or economic

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[13] Urbanisation rate is determined as ratio between urban and rural population.

terms (Cohen, 2004).

Amin and Graham (1997) discuss a city under an economic definition. They explain that a city is a place where the economy is mobilised by providing lots of jobs to workers. In this regard, cities are the places where economies agglomerate from where the jobs are provided. Amin and Graham also emphasise the city economies in a qualitative aspect when it initiates development through human capital.

5.3.8. Transport provision

In describing cities from their transport provision, Ford (2000) argues that city characteristics in a specific period are influenced by the transport-technology era. Transport demand also dynamically changes through different eras. City transport characteristics are signalled by busy movements amongst places and the need for massive and efficient modes. The massive and efficient modes are needed to meet the requirements to keep the city going. In addition, Zhang et al. (2013) mention the widening of the city area and increasing numbers of cities are significantly supported by transportation accessibility through the presence of the road network. This improvement in accessibility influences the proximity whether in intra-city or intercity movement. The development of transport infrastructure provision obviously describes the growth of cities as it grows alongside the city development process (Cheng and Masser, 2003).

5.3.9. City characteristic

Cities obviously have their characteristics, which are historically formed over time. Varying physical appearance, economic, and social conditions can be characterised by spatial organisation developed by facilities distribution (Ford, 2000). In this regard, Amin and Graham (1997) present the creative city, which is defined as a city providing creative facilities. These facilities are provided for creative activities which including media, sport, education, and public spaces.

Cities can also be described by their geographical base position. In relation to geographical position, Ford (1993) expresses two distinguishing city characteristics of coastal and inland cities. Historically, initial growth cities in Indonesia - as Ford's case study discusses, are coastal cities. Most of the coastal cities grew larger as trading

cities. These cities then developed as heterogeneous cities that are formed by varied cultures as their location represented the front gate of a region. In turn, most of the provincial capitals are developed from big coastal cities. In Indonesia, capital provinces have an important role in national development as centres of regional growth. This country has far-flung and dis-connected physical geography. As transportation supply is still a problem in transporting people and goods between places, capital region play a significant role in developing regions autonomously.

5.4. Economic geography

Scholars from varied backgrounds discuss the related topic of city growth under an economic geographers' perspective. Table 5.4 records nine paper examples from this discipline regarding nine criteria in the classification table. This populated table shows different combinations of sub-criteria from the scholar's perspectives.

Table 5.4. Classification table from the economic geographers' perspective

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (A)	The role of transport (B)	The role of city planning (C)	Other causes of growth (D)	Type of country (E)	City/regional type (F)	City Definition (G)	Transport provision (H)	City characteristic (I)
1	Kelley and Williamson (1987)	A3	B1	C1[14]	D3	E2	F3	G1& G3		I2
2	Glaeser et al. (1992) [15]	A2	B2	C1	D2&D3	E1	F3	G1		I2
3	Dick and Rimmer (1998)	A2-A3	B1	C1	D1	E2	F4	G1& G3 & G4	H1& H2	I2
4	Hall (1997)	A3	B1	C1	NE	E1& E2	F4	G1& G3 & G4		I1& I2

[14] It is not stated clearly whether the article refers to planned or unplanned city, but it considers the impact of migration and urban investment, which are a part of a planned city

[15] The journal where this article is cited from has also scope in economic and migration which is concerned by economic geographer

5	Ottaviano and Puga (1998)	A4	B3	C2	D1& D3	E1	F4	G3		
6	Henderson and Wang (2007)	A2	B1	C2	D1& D2	E1		G1& G3		I1
7	Henderson (2010) [16]	A2	B2	C2	D1& D3	E1& E2		G1& G3		I2
8	Storper (2010)	A2	B2	C1[17]	D1& D2& D3	E1		G1& G2& G3		I1
9	Scot and Storper (2013)	A3	B2	C2	D1	E1& E2		G1& G2& G3		I2

Sub-criteria:

Spatial perspective (A)
A1 : Autonomous
A2 : Mega urban
A3 : Regional
A4 : Global

Other causes of growth (D)
D1 : Institution and Government policy
D2 : Human capital

City definition (G)
G1 : Population
G2 : Life quality
G3 : Economic
G4 : Geographical boundary

The role of transport (B)
B1 : Transport drives the city growth
B2 : Transport is an effect of city growth
B3 : Transport is neither considered as a cause nor an effect of city growth

Type of country (E)
E1 : Developed country
E2 : Developing country

Transport provision (H)
H1 : Level of vehicle ownerships
H2 : Transport infrastructure provision

The role of city planning (C)
C1 : City planning drives the city growth
C2 : City planning is not explicitly considered as a causal factor

City/regional type (F)
F1 : Monocentric city
F2 : Polycentric city
F3 : Monocentric Region
F4 : Polycentric region

City characteristic
I1 : Geographical position
I2 : Facilities provision
I3 : People characteristic

5.4.1. Spatial perspective

The global perspective concerns the growth spread across countries (Ottaviano and Puga, 1998). With regards to the economy, this is shown by the spread of industry

[16] Note that The Journal of Regional Science (JRS) publishes original analytical research at the intersection of economics and quantitative geography.

[17] There is no explicit explanation in this article about the role of planning, but it refers to how planning drives the growth.

from country to country. It can also explain why a multinational industry has its branch in countries across the world. Krugman (1991) points to the fact that easier concentration of economic activities can be achieved if some supported factors are mobile across countries.

Growth of the city, on the other hand, is induced by regional development. One effect of regional development is the generation of migration. In-migration from rural to urban areas, as a reaction to the scarcity of agricultural land in the rural areas, creates an increase in city population and also attracts capital to the particular (Kelley and Williamson, 1987).

5.4.2. The role of transport

Referring to the populated table above, studies that are concerned with transport as the cause of city growth broadly argue that the existence of transport triggers growth in the city. This refers to the increasing population, the growth of economic activity, land use development, and also the formation of city pattern. In this regard, Dick and Rimmer (1998) discuss how transportation takes an important role in settlement pattern formation. The presence of roads and motorbikes also support the extended city area through the process of urbanisation into the outskirts.

5.4.3. The role of urban planning

In their discourse Dick and Rimmer (1998) explain the transitional development in cities following city planning. Using Southeast Asian cities as their case study, they found that there were changes in the city planning point of view over time. These Southeast Asian cities mostly have experienced colonialism. Therefore, they are also influenced by western culture as well as affected by local culture. City planning shapes the city in term of its pattern and social structure.

5.4.4. Other causes of growth

In a summary statement included in his paper, Glaeser concludes that the definition of an institution is one of the constraints since it constrains people’s behaviours in the interests of maximising the wealth or utility of principals (North in Glaeser et al, 2004,

p. 8). Considering the competence to regulate, this relates to the growth of the cities. Therefore, the institution has a close relationship with the quality of the people who are involved in it.

Glaeser (2004), Glaeser (1992) and Henderson and Wang (2007) have shown that an institution affects the growth of the city through their effects on the urbanisation. However, there are two opposing ideas regarding the institutional effect of the city's growth that still basically elucidate the relationship between institutional and city growth. One idea says that the growth of economies follows the investment of institutions so that the increasing economic growth is expected in line with the increasing investment in institutions. Together with increasing income per capita and human capital, they contribute towards the improvement of the institutions (Glaeser, 2004). The other idea says conversely, that the improvement of institution leads to economic growth.

These interactions and migration have implication for knowledge flows across cities. Furthermore, Lucas (1988) states that migration drives people with human capital to move to places where there is greater human capital. Accordingly, the existence of human capital closely relates to migration.

Urban growth is an outcome of the ability to attract workers with high levels of human capital (Storper and Scott, 2009). The criteria of high human capital include high skill level, education and knowledge technology. Logically the attractive cities are those which have a comparative advantage (Thisse, 2010). In this understanding, the growth of cities is related to population migration to particular cities. Furthermore, human capital stimulates the growth of the city through the spill-over effect.

As mentioned by Storper (2010), the concentration of activities referred to as agglomeration promotes specialisation[18]. Arguing that specialisation is a result of activity concentration, this initiates the growth of the city when the existing specialisation grows faster than the national economy. Moreover, Duranton and Fuga (2000) state different cities have specialisations in different sectors, so that the specialisation of cities is mostly indicated by majority labour in specific sectors. Here,

[18]It quite mystifies since the agglomeration activities emergence is a result of geographic advantage and human capital spillover. Economic activities find themselves together in particular city as it has the right sector that supports them (Storper, 2010).

people rationally decide to find a place where they can get a better life by following others with the same skills. The logical reasoning relates to job availability in the location where these people follow. Specialisation in a city should speed up growth since it generates a comparative advantage for the city Glaeser et al., 1992).

In this regard, the city grows in size in line with people migration and the urbanisation process of the hinterland in turn. Accumulation of different people with different kinds of skills results in a specialisation that appears in a specific place (Storper, 2010). Specialisation does not appear in all places since the accumulation which was mentioned previously, occurs in the attracting place. Highly qualified humans (such as well-educated people and highly skilled workers) accumulates in specific places.

5.4.5. Type of country

In fact, the concept of a developed country refers to a country which has already been developing and the development has since settled. Urbanisation in developed countries is also an important factor in the city and country growth as it is in developing countries. The difference lies in the speed of its process. Henderson (2010) remarks that the developed countries spent a longer span of time[19] compare with those in the developing countries for the same stage of urbanisation.

The present condition of growth in developing countries is mostly defined by past evidence. In the present day, it shows a disequilibrium that is denoted by over-urbanisation (Kelley and Williamson, 1987). This is pointed to by an enormous migration to big cities since they provide more jobs and a better standard of living.

Furthermore, they state that current developing countries pay more attention to the urbanisation process. This occurs with a fast increasing urbanisation phenomenon in a shorter time span than those that occurred in developed countries (Kelley and Williamson, 1987; Henderson, 2010 p. 1). The attention to this urbanisation policy is shown by the role of national government policy. The national government policy concerns decelerating city growth with sustainable motivation. Scarcity of fuel energy

[19] He notes “10–20 % of the population is urbanized to one where 60–85 % is urbanized—occurs now often in a span of about 30 years, as opposed to the more leisurely pace of urbanization in today's developed countries which played out over 100–150 years” (Henderson, 2010).

becomes an important reason as to why this should be done.

One of the specific characteristics of Southeast Asian cities can be found in the desa-kota model which refers to new regions as a result of extended urban activity. This type of region also appears as a result of a much more long-term development, as is clearly represented below:

> A much longer-term perspective is offered which contrasts the historical pattern of urban development in Southeast Asia, and shows that over the past century or so there have been alternating phases of convergence and divergence (Dick and Rimmer, 1998 p. 2304).

However, there are some variables that support the city growth process and expedite their growth. These variables include geographic position, the emergence of regional growth and population characteristics. Geographic position leads to the attractiveness of a particular city. Growth of the initial city, especially in most of the South East Asian cities, is determined by their geographic position. Most cities that grew faster were located in coastal areas due to the ease of transportation. Coastal cities mostly develop as trade and service cities rather than agricultural cities. Contrastingly, inland cities had slower growth as their transportation was constrained in term of connecting with other regions, so they relied on growth through their own resources (Nas, 1986). From the view of regional growth, there is interdependence amongst cities within a given region. Therefore, an occurring development in a city drives some changes to other cities. The third supporting factor (population characteristic) affects the process of growth. Open-minded people generally help accelerate the growth process smoothly, whilst the contrasting type of people result in the contrary.

5.4.6. City/region type

The economy is mostly spoken of as a factor influencing the emergence of new centres of activity. As most cities first grow with a single centre of activity, over time the city attracts people and more activities are concentrated. Ottaviano and Puga in this regard mark the emergence of centres in regional terms. The emergence of other regional centres correlates with the specialisation of economic activities (Hall, 1997). Firms tend to look for low-cost products that can be obtained by locating in different places and concentrating on specific products. Accordingly, as there are various different types of firms, some low-cost firms might concentrate on a specific area that has lower costs of production (Ottaviano and Puga, 1998). This also encourages firms to spread

across the region and encourage new centres to emerge. On the other hand, increasing population also plays a role in the emergence of the polycentric region since it grows not only along with the need for space to live but also economic activities from where jobs are created.

5.4.7. City definition

Kelley and Williamson (1987) define the growth of the city in accordance with the population and the economy. Population increases as an effect of in-migration that in fact influences the migration cost. The growth of the city is seen through the increasing population as the result of the occurrence of in-migration. The authors also describe the growth of the city as rising through investment which generates economic activities in a particular city. Ottaviano and Puga (1998) also address the issue of the economy in defining the growth of the city. Regarding the economics, Henderson and Wang note an interaction between economic conditions and city centre expansion, both in numbers and area.

Moreover, in defining the growth of the city Dick and Rimmer (1998) concern themselves with geographical extension. The city becomes wider as a result of industrialisation. Industries grow and lead urbanisation in the peripheries. The peripheral areas grow jobs are created there and therefore population growth is driven. In turn, both the primary city area and peripheral area are linked and extend then to the city area.

5.4.8. Transport provision

As mentioned by Dick and Rimmer (1998) the emergence of transport infrastructure has empirically explained the growth of cities. Developments of a particular city over time are represented by transport developments. Accordingly, as cities start to grow, transport starts to develop in a simple way and becomes complicated when the city grows further. Moreover, transport also develops and reaches a wider area when the city extends its geographical boundary. In this regard, Dick and Rimmer describe that transport sustains commuting activities, as it provides a link between different land uses.

On the other hand, city expansion and activity development generate growth in vehicle

ownership. Infrastructure provision and increasing income per capita are two reasons among many behind this increase in vehicle ownership. Transport infrastructure is developed to reach wider areas as the city widen beyond the former geographical boundary, to link the different city activity centres. The wider transport infrastructure also serves the increasing vehicle ownership. Furthermore, Dick and Rimmer discuss that rising vehicle ownership relates to economic conditions. Increasing per capita income enables people to become free from public transport dependence.

5.4.9. City characteristic

Growth in investment and increasing population in a particular city affects the requirement for some physical facilities. Housing, factory sites, and economic facilities are some examples of facilities that are required along with increasing investment and population. On the other hand, the provision of facilities in a city fosters capital accumulation and population migration to the city. Accordingly, this situation plays an important role in the growth of the city (Kelley and Williamson, 1987).

5.5. Urban planning

Table 5.5 is populated by some paper examples considering the urban planning field. As mentioned in chapter one, urban planning is an interdisciplinary approach that synthesises different disciplines such as geography, economy, sociology, etc. Here this interdisciplinary approach is treated as a single discipline. Incorporating a number of papers the classification table represents how those papers see the growth of cities.

Table 5.5. Classification table from urban planner perspective

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (B)	The role of transport (C)	The role of city planning (D)	Other causes of growth (E)	Type of country (F)	City/regional type (G)	City Definition (H)	Transport provision (I)	City characteristic (I)
1	Chinitz (1991)	A2	B1	C1	D1	E1	F2	G1& G2& G3	H1& H2	I2

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (B)	The role of transport (C)	The role of city planning (D)	Other causes of growth (E)	Type of country (F)	City/regional type (G)	City Definition (H)	Transport provision (I)	City characteristic (I)
2	Al-Oteibi et al. (1993)	A1	B1	C1	D1	E2	F2[20]	G1& G3	H1& H2	I2
3	Lo and Marcotullio (2000)	A4	B1	C1	D1& D2	E2	F4	G2& G3	H2	I2
4	Polese (2005)	A1	B2	C1	D2& D3	E1	F1	G1& G3	H2	I2
5	Yeoh (2005)	A4	B2	C2	D1	E3		G3		I3[21]
6	Dökmeci and Berköz (1994)	A1	B1	C1	D1	E2	F2	G1& G3		I2
7	Guy and Marvin (2007)	A1[22]	B1	C1	D1	E1		G3	H2	I2
8	Atkinson (2010)	A1[23]	B1	C1	D1 24	E2		G3	H2	I2
9	Burger and Meijers (2012)	A2	B2	C1	D2	E1	F4	G1& G3		I1
10	Percival and Waley (2012)	A4	B2	C2	D1	E2	F2	G1& G3	H2	I2
11	Burger et al. (2013)	A3[25]	B2	C1	D1	E1	F4	G1		I1
12	Melo et al. (2013)	A2	B1	C2	D1	E1-E2		G3	H2	I2

20 It is not explicitly expressed about polycentric, but it explains about more than one centre in concerned city (see page 167)

21 I'm not sure about people characteristic role in supporting city growth in this article. But according to the article discussion that refers to culture and people, it might consider people characteristic criteria

22 It talks about future local infrastructure economies

23 This article talks about strengthening area using their own resources

24 Government has played an important role in policies. The policies determine development direction. Changes of government policy influence the city development.

25 It explains about linkage and interdependence between cities in city growth

Spatial perspective (A)
A1 : Autonomous
A2 : Mega urban
A3 : Regional
A4 : Global

Other causes of growth (D)
D1 : Institution and Government policy
D2 : Human capital

City definition (G)
G1 : Population
G2 : Life quality
G3 : Economic
G4 : Geographical boundary

The role of transport (B)
B1 : Transport drives the city growth
B2 : Transport is an effect of city growth
B3 : Transport is neither considered as a cause nor an effect of city growth

Type of country (E)
E1 : Developed country
E2 : Developing country

Transport provision (H)
H1 : Level of vehicle ownerships
H2 : Transport infrastructure provision

The role of city planning ©
C1 : City planning drives the city growth
C2 : City planning is not explicitly considered as a causal factor

City/regional type (F)
F1 : Monocentric city
F2 : Polycentric city
F3 : Monocentric Region
F4 : Polycentric region

City characteristic
I1 : Geographical position
I2 : Facilities provision
I3 : People characteristic

5.5.1. Spatial perspective

Table 5.5. is populated by some paper examples considering the urban planning field. As mentioned in chapter one, urban planning is an interdisciplinary approach that synthesises different disciplines such as geography, economy, sociology, etc. Here this interdisciplinary approach is treated as a single discipline. Incorporating a number of papers of the classification table represents how those papers see the growth of the cities.Table 5.5 is populated by some paper examples considering the urban planning field. As mentioned in chapter one, urban planning is an interdisciplinary approach that synthesises different disciplines such as geography, economy, sociology, etc. Here this interdisciplinary approach is treated as a single discipline. Incorporating a number of papers the classification table represents how those papers see the growth of cities.

Table 5.5 shows that there is a varied discussion from the urban and city planner perspectives regarding spatial perspective criteria. This makes sense since this perspective could be presented from different points of view. Each spatial perspective leads to subsequent planning.

One reason for having a global connection is the high demand in international activities to support economic growth in accordance with manufacturing products (Lo and Marcotullio, 2000). The international relationship then leads to the emergence of dominant economic activities in the city. Polese (2005) expresses the growth of the city as a regional perspective. It is said that the growth of a city from economic growth is seen as a regional development since it creates and encourages the growth of cities within its area through economic linkage.

The world-connected city is expected to become more prevalent in some Southeast Asian countries that accommodate a global cultural such as integrating local culture as well as a transnational relationship (Yeoh, 2005). The transnational relationship facilitates changes in many Southeast Asian countries as it advances new technology across countries. Since this area is claimed to be one of the fastest-growing regional economies (McGee and Robinson, 1995), the changes are an important influence on the growth process of the cities. Moreover, it is linked by development across countries.

In regard of autonomous growth, Atkinson presents the autonomous growth of Indonesian cities. He expresses city growth as improving city conditions by strengthening their potential to grow.

Regarding the mega-urban spatial perspective, Burger et al. (20130) explain that the

city grows with functional networks and geographical scope. It is facilitated by the spatial organisation of the urban network that manages the distribution of economic activities between geographical units within the mega-urban region. The network is expected to gain equitable development across the whole-mega-urban area by strengthening the relationship between unit areas.

5.5.2. The role of transport

Historically, some Asian cities grew as a result of transport development. This is expressed in such pieces of evidence which appears over time. It can be recorded when the existence of some transport infrastructures influence modernisation, rapid urbanisation, population influx and expansion of cities in Taipei, Cebu (Philippines), Makati, Bangkok, Semarang, Purwokerto as well as in Riyadh (UAE) (Kishiue, 2005). The role of transport can be different in each period of city growth and relates to transport and city planning.

Furthermore, Al-Oteibi et al. (1993) mention that the evolution of transport infrastructure shows city development. At the beginning of a city, the road system is considered simple; it makes connections between major land uses. The development of the city remains in its initial stage of development. Development of the transport infrastructure over time then leads to the growth of the city. Dökmeci & Berköz (1994) show that transport leads to city expansion. The expansion is defined by the emergence of a widening urbanised area and new city centres.

From a global perspective, the role of transportation is an important factor in the growth of the city, since it creates international (Lo and Marcotullio, 2000). This connectivity obviously drives world interdependency between countries that also supports the economic relationship between them. In the link between transport and growth – Polese (2005) refers to economic growth as the trigger of city growth, expressed as a causation relationship.

5.5.3. The role of urban planning

Certain articles contained in the above table describes that city planning is a factor concerned with city growth from the regional and city planner perspective. City planning, especially in zoning regulation, has an important role in city growth.

Dökmeci & Berköz (1994) explain that regulation has obviously driven city expansion through the widening of urbanised areas outside of the older city centre. In more detail, the role of city planning addresses the intended form of the city. Al-Oteibi et al. (1993) determine some roles of city planning in the growth of the city through the following actions:

(1) Facilities provision throughout the city. Planning aims to improve the health and welfare of people throughout the city. It is conducted through the distribution of health facilities within the city area. It is distributed in accordance with the density level of each section of the city. The provision of education and religious facilities is also prepared in the same way as health facilities.
(2) Infrastructure provision in the city area. As evidence shows that infrastructure development lags behind the increasing population, the planning of infrastructure – which is comprehensively included in city planning is needed to drive the growth of the area. In this regard, planning the needs of infrastructure in intended sections so that it can lead to growth.
(3) Control over transportation. Road pattern design provides direction toward certain locations for facilities and possible city-expanding location. Accordingly, the road pattern design creates the image and development direction of cities. The development of transport is alongside the city growth process. It develops from a simple form – which shows an unimproved route to a complicated network integrating all types of transport (air, land, rail, and water) and connecting activities throughout the city.

5.5.4. Other causes of growth

Under this criterion, most articles refer to institutions that promote the growth of the cities. The direction and implementation of planning are obviously affected by institutions.

Institutions have a role in contributing to the growth of the city. Investment regulation that then encourages industrial expansion is just one example. The industrial expansion in a certain area generates new jobs, increase income, and escalate welfare (Lo and Marcotullio, 2000). The role of institutions can also be explained by their position in driving the developing of the city through facilities construction planning (Yeoh, 2005). Using examples in Indonesia, the policy for constructing certain new

activity centres has triggered growth of the cities. Moreover, institutions also take part in determining the development of the city. Institutions determine the strategy to develop the intended city.

The growth of the city is obviously influenced by the spill-over of human capital. Some scholars argue that human capital contributes to the growth of the cities (Polese, 2005). It promotes growth through the spill-over of knowledge and innovation. Taking into account the agglomeration phenomenon that encourages activities and people to geographically cluster in particular places, it facilitates the knowledge spill-over through sharing ideas, new concepts, and information since educated people come together in the agglomeration area. In understanding city life, evidence shows that the agglomeration of people generates a strong impact on cultural and behavioural change.

5.5.5. Type of country

Considering the given criteria, there are three types of country: developed countries, developing countries, and Southeast Asian countries. Referring to the Southeast Asian countries, they obviously consist of a large number of countries with increasing populations and migration from rural areas to big cities. Most of the Southeast Asian countries have experience of colonialisation which provides an important effect in city development policies. One of these policies is how they are developed following the Western form without depending on the West (Yeoh, 2005). Copying the Western city concept in modernity is an important starting point in developing the cities. In this regard, Southeast Asian countries strike a balance between modernity and local culture. Most developing countries have specific characteristics that relate to population, the economy, and transport conditions.

5.5.6. City/region type

Thisse (2010) argues that the polycentric city or region initially emerges when sub-centre activity appears. The emergence of sub-centres is encouraged by some factors: the deterioration of former centres, growth in population and activities, growth in technology and changes in people's points of view. Dökmeci & Berköz (1994) state that there are two principal forces affecting the presence of these sub-centres. Thus,

as in Thisse's statement, the increasing cost in the first centre prompts the other centres in the polycentric pattern. In order for this to happen, the dependency of the centres emerging later on the initial primary centre is big. Hence, good interaction between centres whether in transportation infrastructure or communication is needed.

In Dökmeci & Berköz (1994), the emergence of the polycentric city is a reason for the expanded use of automobiles alongside the extension of business activities which established the economics of the city. Intensive land use in the primary centre has pushed firms to locate their manufacturing in new centres of activity, which consequently leads to the increased population there.

5.5.7. Transport provision

The greater the growth of activities, the more provision of transport infrastructure is required. Polese (2005) explains this relationship through the increasing movement of people and goods within a city. A growing number of movements requires more transport infrastructures, including transport control and management.

In describing the growth of the city, increasing numbers of vehicles are considered (Dökmeci and Berköz, 1994). Types of the vehicle could be different over time in line with the development of transport technology. The increasing number of private vehicle ownerships accompanying the growing city characteristics unfortunately generally does not match the cultural and physical fabric of the cities. The needs of private vehicle ownership correspond to the inadequate public transport provision.

5.5.8. City characteristic

In regard to the characteristic of the city criteria, Polese (2005) presents a positive relationship between economic growth – which represents the growth of the city and facilities provision. The increasing provision of facilities facilitates growing activities agglomeration. This then affects the microeconomic climate within the city. Atkinson presents that the consequence of city growth is the provision of facilities in line with the development process and population growth. Provision of facilities is firstly addressed in order to meet the basic needs of urban life but as the city grows, facilities are gradually developed to fulfil and support the quality of life improvements (Atkinson, 2010).

Yeoh (2005) shows that the characteristic of people has a specific influence on the growth of cities. She explains that the pluralism of urban life can determine the construction of a city as well as a homogenous people characteristic.

5.6. History

Table 5.6. presents seven papers from different scholars to be populated in the classification table from historian perspectives. This table marks different perspectives within a group of historians that are shown by varied combination sub-criteria. However, the logical thinking that they use in discussing the empirical evidence in their papers represents their disciplinary background. Discourses in those papers are broadly concerned with the occurrence of events in the city development.

Table 5.6. Classification table from historian perspective

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (B)	The role of transport (C)	The role of city planning (D)	Other causes of growth (E)	Type of country (F)	City/regional type (G)	City Definition (H)	Transport provision (I)	City characteristic (I)
1	Hart (1992)	A3	B1	C1[26]	D1	E1		G1	H1& H2	I1
2	Hourihan (2000)	A1	B1	C1	D1	E1	F1	G1	H1& H2	I2
3	Hess (2006)	A1	B1	C1	D1	E1		G1& G2	H2	I2
4	Lang (2006)	A4	B1	C2	D3	E1& E2		G3	H2	I2
5	Heitzman (2008)	A1	B1	C1	D1	E2	F1	G1& G3	H2	I2
6	Martinez and Miras (2009)	A2	B1	C2	D1	E1		G1& G3	H2	I2
7	Hein (2010)	A1	B1	C2	D1	E1	F1	G3	H2	I2

Sub-criteria:

[26]Although this article does not clearly mention city planning, I indicate it concerns about city planning since one of the article discussions is on creating urban structure.

Spatial perspective (A)	***Other causes of growth (D)***	***City definition (G)***
A1 : Autonomous	D1 : Institution and Government policy	G1 : Population
A2 : Mega urban	D2 : Human capital	G2 : Life quality
A3 : Regional		G3 : Economic
A4 : Global		G4 : Geographical boundary
The role of transport (B)	***Type of country (E)***	***Transport provision (H)***
B1 : Transport drives the city growth	E1 : Developed country	H1 : Level of vehicle ownerships
B2 : Transport is an effect of city growth	E2 : Developing country	H2 : Transport infrastructure provision
B3 : Transport is neither considered as a cause nor an effect of city growth		
The role of city planning (C)	***City/regional type (F)***	***City characteristic***
C1 : City planning drives the city growth	F1 : Monocentric city	I1 : Geographical position
C2 : City planning is not explicitly considered as a causal factor	F2 : Polycentric city	I2 : Facilities provision
	F3 : Monocentric Region	I3 : People characteristic
	F4 : Polycentric region	

5.6.1. Spatial perspective

The distribution spatial perspective criteria from 6 scholars in the above table show that articles are mostly concerned with the autonomous city. Hence, they discuss how cities grow autonomously, dealing with their own resources. Hein (2010) explains the exploitation of local and endogenous resources of cities in the Japanese context. The resources here not only refer to land use, people and local economies but are also concerned with the local culture.

Meanwhile, Lang (2006) considers the global perspective on the growth of cities. Cities grow in a global context in which the growth of the city occurs as a part of an interrelated worldwide system. The worldwide redistribution of manufacturing production sites is one of the triggering factors in the emergence of globalisation. It provides an effect for both the manufacturers and the countries whereas the manufacturing is redistributed. On the manufacturer side, they choose countries which have low levels of labour salary. Therefore, they expect to reduce the economic cost of production. On the other side, for redistributed country locations, it positively generates greater job opportunities which are the beginning of economic growth.

5.6.2. The role of transport

The historians in the above table mostly position transportation as a driving factor in the growth of cities. The existence of transport, whether in transport infrastructure construction or developing technology in transportation, generates economic growth, drives population increases and develops the city environment. In this regard, Hess (2006) presents that the network structure of transport infrastructure shapes a city's environment. Furthermore, Hess presents that the presence of infrastructure aims to form the city and also create a beautiful city.

In the presence of transport infrastructure, the experience of many countries shows the effect of transport infrastructure presence on city growth. The role of transport in the city growth process is clearly mentioned through the creation of new railway and road infrastructure and has a significant effect in stimulating increased population (Hess, 2006; Heitzman, 2008).

5.6.3. The role of urban planning

From past evidence, the development of city planning starts from the unplanned city to the partially planned and, finally, to the comprehensively planned city. The last type of city planning appeared in combination with population influx and industrial growth in the late nineteenth century (Hess, 2006). Throughout the ages, planning became very important in determining the pattern of city growth.

5.6.4. Other causes of growth

The institution becomes an important cause of city growth from the distribution of the criteria in the above table. It refers to government policies in defining the growth direction of the economy, distribution and growth of population, infrastructure development, and land use development.

In developing countries, population increases commonly arise alongside the urbanisation process, with government policies becoming very important in controlling population distribution and human quality. Rapid population growth in developing countries, including Southeast Asian countries, deteriorates the environment and causes inequity development. Therefore, the government framework

in city development defines efficient city development.

The strengthening of the local economy and cultural power was intended to provide a foundation for city growth (Hess, 2006; Hein, 20100). Creating new growth centres is intended to spread the development effect to a wider area. However, the primate city - as an implementation of a growth centre was a colonialist legacy in most developing countries and Southeast Asian countries, which has generated a huge migration to the centres. In this regard, Heitzman (2008) delivers a discussion about secondary city development in order to counter the centrality of development in big cities.

5.6.5. Type of country

The historian's discussion of city growth in developed countries is firstly concerned with industrialisation which initiates the growth (Hess, 2006; Heitzman, 2008). The presence of industrialisation influences city development. As occurred in the US, industrial centres affect city redesign and rebuild whether this is in utilities, infrastructure, or land use. Furthermore, the construction of the intended growth of the city as well as city migration.

As city growth generally relates to the urbanisation process, there are some differences in dealing with the urbanisation process in both developed and developing countries. Nash states that the broad differences between urbanisation in both country types are in the concerned development, economic process and demographic process. Certain factors which contribute to the different perspective between these country types are presented in Table 5.7. The table presents distinguishing conditions between both countries that are indicated by the starting point of growth, the population characteristics, which play a major role in the growth process, and dynamic progress in growth.

Table 5.7 Distinguishing urbanisation process between the developed country and the developing country (Nas, 2002)

Type of country Features	Developed countries	Developing countries
Time	Industrialisation (that represents economic development) was a starting point of urbanisation	Urbanisation was a starting point of industrialisation
City's population characteristic	Population growth is lower than those that happen in developing countries	An influx of city population
Urbanisation process speed	Small differences amongst cities in the level of urbanisation	Unbalanced urbanisation between big cities and small cities. The larger the city, the more rapid the urbanisation process.

5.6.6. City/region type

The monocentric city is the most common type of city that is concentrated on by scholars in the above table. The concentration refers to the role of an initial centre in the city growth process. Growth is first centralised in an early city centre. Further, deterioration of condition in the city centre and the growth of outskirts encourage new centres to emerge.

5.6.7. City definition

The population is mentioned in all articles in the historian perspective in the above table. A level of population is used as a minimum limit in determining a city. The growth of the city is indicated by an increasing population. As happens in other developing countries, cities in East Asia grow in population density along with a quickly increasing population. Heitzman (2008) found the population mostly lives in urban sites. This arises as a result of cities attracting migration, generated by the specific factors of each city. Migration could obviously contribute to the growth of the city (Hourihan, 2000). It is initially generated by the emergence of industrialisation in the city which then attracts migration. The other causes can be the attraction factors to population migration.

5.6.8. Transport provision

Transport infrastructure provision is obviously concentrated on by some historians in table 5.6. New construction of railways, roads and stations are some of the transport infrastructures that influence growth. This is with respect to how transport infrastructure generates denser land use and activity. This is affected by improvements in accessibility and ease of movement that are a consequence of infrastructure provision.

5.6.9. City characteristic

Regarding Table 5.6., most historians agreed that facility provision in a city become a big attraction for people to move to the cities. Furthermore, the provision of the facility is a consideration in choosing activity locations. Therefore in their development, this variable affects the growth process of the city.

5.7. Sociology

Table 5.8 is populated with seven papers from different journals. These papers are taken to illustrate how some sociologists undertake research concerning growth of the city. There are varied sub-criteria that concentrated on defining the growth of the city.

Table 5.8. Classification table from sociologists' perspective

No	Criteria / Scholars	Disciplinary views				Subject matter				
		Spatial perspective (B)	The role of transport (C)	The role of city planning (D)	Other causes of growth (E)	Type of country (F)	City/regional type (G)	City Definition (H)	Transport provision (I)	City characteristic (I)
1	Baldassare and Protash (1982)	A1	B3	C1	D1	E1		G1		I3
2	Clammer (2003)	A4	B3	C2	D2	E2		G1& G3		I3
3	Glassman and Sneddon (2003)	A3	B2	C1	D1& D2	E2	F4	G3	H2	I2
4	Voith and Wachter (2009)	A3	B1	C1	D1	E1	F4	G1& G3	H1& H2	I2
5	Tirtosudarmo (2010)	A3	B1	C1	D1& D2	E2		G1& G2	H2	I1
6	Molotch (2011)	A1	B1	C2		E1		G1		I2
7	Hogan et al. (2011)	A4	B1& B2	C2		E2		G2	H2	I2

Features of criteria:

Spatial perspective (A)	***Other causes of growth (D)***	***City definition (G)***
A1 : Autonomous	D1 : Institution and Government policy	G1 : Population
A2 : Mega urban	D2 : Human capital	G2 : Life quality
A3 : Regional		G3 : Economic
A4 : Global		G4 : Geographical boundary

The role of transport (B)	***Type of country (E)***	***Transport provision (H)***
B1 : Transport drives the city growth	E1 : Developed country	H1 : Level of vehicle ownerships
B2 : Transport is an effect of city growth	E2 : Developing country	H2 : Transport infrastructure provision
B3 : Transport is neither considered as a cause nor an effect of city growth		

The role of city planning ©	***City/regional type (F)***	***City characteristic***
C1 : City planning drives the city growth	F1 : Monocentric city	I1 : Geographical position
C2 : City planning is not explicitly considered as a causal factor	F2 : Polycentric city	I2 : Facilities provision
	F3 : Monocentric Region	I3 : People characteristic
	F4 : Polycentric region	

5.7.1. Spatial perspective

From the table above, there are three spatial perspective criteria that are concentrated on by some articles. They are the autonomous, regional, and global perspective. The autonomous perspective considers the local community context in determining growth controls. Regarding growth policies, the local community characteristic is a power to dominate development decisions (Baldassare and Protash, 1982; Molotch, 2011).

The other articles are concerned with the regional perspective role of the city in regional development. They refer to whether the city is a primary centre or a secondary one. Each hierarchy has a specific function in supporting the regional development regarding decentralisation as the basic idea. The spread of changes that commonly appear alongside the city growth process influences the intra-city relationship. They then transfer social changes as the result of development between cities. However, decentralisation growth through the creation of new centres shares

the widening city problem as growth spreads. Borrowing evidence from Glassman and Sneddon (2003), decentralisation of growth centres also creates deterioration in the quality of life and environment in the new centres. Spatial changes are related to social transformation in the intended cities. Therefore the strengthening local community system is needed along with the decentralisation program.

The globalisation that is firstly defined as an economic phenomenon, as stated by Clammer (2003), has implications for relationships between countries. It is constructed by the emergence of more nodes which link between countries in communication and cultures. Furthermore, globalisation also needs to be understood in the cultural and political dimension. Globalisation nests countries in a link between sociological and political characteristics as well as altering economic conditions. Globalisation influences how the new form will be governed and humanised. It refers to the relationship between people in communities, between communities in a country, between communities and their government, and the way governments govern their citizens. Through globalisation, Clammer notices the transformation of culture in most Southeast Asian countries that can be identified by the emergence of consumer culture especially in the new appearance of the middle class. The transformation of culture also influences the demand for education, healthcare, political participation and people empowerment in development.

5.7.2. The role of transport

Concentrating on the role of transport in the growth of the city, some articles argue that transport development supports social transformation. Concentrating on the role of transport in the growth of the city, some articles argue that transport development supports social transformation. Transport is identified as a causal factor of city growth. The presence of new transport infrastructure affects the competitiveness of cities, which positively influences the economic growth of cities significantly (Voith and Wachter, 2009). Transport as a causal factor is also found in the first Indonesian cities where growth is found in most initial coastal cities. The existence of the inter-city network is pointed to as a major influence in the growth of these cities (Tirtosudarmo, 2010). In this regard, harbours and railways are believed to be the gates to interactions with other places.

On the other side, Glassman and Sendon (2003) find that, in their case studies,

transport improvement becomes a consequence of growth. The construction of new roads, for example, is a response to crowded transportation. The new road infrastructure is also an answer to fulfilling the demand that arises along with the increasing number of movements between centres in a polycentric region.

5.7.3. The role of urban planning

The role of city planning in city growth is found in how planning accommodates community growth. Glassman and Sendon (2003) present that planning is positioned to orientate the growth of the city, rather than having been driven by the need for infrastructure and city development. Therefore, city planning has an important role in driving the direction of city growth.

The role of urban or city planning can be observed in the way planning directs the growth pattern of the city, whether by developing activities, relationships between cities, or providing urban facilities (Voith and Wachter, 2009; Tirtosudarmo, 2010). Voith and Wachter found that urban planning, through zoning controls successfully influences the transformation from declining city to a growing city.

5.7.4. Other causes of growth

Clammer found that institutions have an important role in changing people's point of view which in turn becomes one of many aspects that plays a role in the city growth process. Globalisation affects the emergence of active participation in democratisation and people empowerment. The restructuring of institutions drives governments to develop and grow cities (Clammer, 2003). In regard to this criterion, government policies are considered to induce decentralisation growth and promote the growth of secondary cities (Glassman and Sneddon, 2003). Therefore, they take into account the role of institutions as the cause of city growth in accordance with regional development. The emphasis of decentralisation growth in Southeast Asia refers to the rising problem in primary city development which affects the emergence of the city problem, i.e. degradation of the environment, congestion, and deterioration of health and quality of life.

On the other hand, Tirtosudarmo mentions that institutions have a role in social transformation, which is argued to be a triggering factor in city development. The

characteristics of the city are defined by government policy in leading its direction (Tirtosudarmo, 2010).

5.7.5. Type of country

Referring to developed and developing countries, (Tirtosudarmo, 2010) states that the difference is on the effect of urbanisation. Population welfare improvement and increasing economic growth in developed countries occur alongside the urbanisation process. However, in developing countries, the urbanisation process is still passing the stage of an increasing gap between upper and lower-income classes. Social tension could potentially appear as the result of the disparities.

5.7.6. City/region type

Glassman and Sendon (2003) discuss the polycentric region city type. This represents a type of region with numerous centres within its area. The polycentric region in their discussion is traditionally formed by the growth pole that came from primary cities. The decentralisation policy encourages the emergence of new centres, whether they are secondary cities or other grades of cities. These new cities then promote growth in their surrounding area, as well as across the whole region.

5.7.7. City definition

Using a physical indicator to measure the growth of a city is usually considered easier because it provides a spatial pattern that is quantifiable. However, to gain a comprehensive understanding of city growth it is necessary to examine both physical and non-physical indicators (Gale and Moore, 1975). Sociologists look at relationships amongst communities or people that construct social systems. They analyse how the social system can occur and generate causative relationships within the system. Regarding city growth, social science considers issues of communities including localities in the growth process (Moloth, 2011). In this relationship, the population and characteristics are considered in the control policy of growth. The two crucial variables in population characteristics are homogeneity and income level (Baldasare and Protase, 1982). Community satisfaction in the growth policy will create decent conditions to increase the growth of the city.

Furthermore, increasing population constitute human activities. In turn, this will have implications for the spatial formation and social transformation of the city's inhabitants (Tirtosudarmo, 2010). To this point, Voith and Wachter (2009) suggest that the growth of the city relates to increasing density because when the city grows, density increases. In cities that are defined as growing cities, this is identified as typically occurring more quickly than increases in population. The density of the city in the sociology perspective correlates with some social problems that in turn influence development policy in intended cities. However, the large population in primary cities (in the case of Southeast Asian countries) raises a serious problem for city life. Clammer argues that growing population influences environmental deterioration. It also brings about what he calls a sociologist endemic - which points to pluralism (Clammer, 2003:p.406). Glassman and Sendon (2003) define the growth of the city with reference to the increase of economic growth. They mention that this relates to the increasing number of manufacturing activities which improve employment opportunities and raise gross domestic product per capita. With regard to economic growth, Voith and Wachter (2009) interpret this as the increased level of people's affordability for housing. In accordance with the ability to purchase property, Voith and Watcher also argue that the growth of cities is expected to promote the wealth of people, as they can fulfil their basic needs (Dicken and Lloyd, 1990).

5.7.8. Transport provision

Transport infrastructure provision is discussed in some articles in the table above. This relates to the distribution and collection role of transport in initial city growth in Southeast Asian Countries (Tirtosudarmo, 2010). The presence of transport infrastructure, in turn, connects places and generates social relationships between different local cultures.

The growth of the city is followed by increased vehicle ownership. This obviously influences the emergence of traffic congestion. Voith and Wachter (2009) argue that this appears to have an effect of rising income per capita and decentralisation growth by creating new activity centres. These new centres include the presence of suburban development.

5.7.9. City characteristic

Glassman and Sneddon (2003) characterise the growth of the city from its provision of facilities. Some facilities such as schools, shops, hospitals, etc are available and grow along with the cities. The presence and growth of these facilities then also encourages the presence of other facilities and activities in cities which accelerates growth.

The presence and increasing provision of facilities have strong relationships with the growth of cities. The correlation between facilities provision and concentration of economic activities underpins city growth (Tirtosudarmo, 2010). In addition, an increasing population also creates greater diversification and increasing numbers of facilities in a city.

5.8. Chapter conclusion: Possible approaches for a particular discipline

Previous sections in this chapter have presented varied perspectives from within different disciplines. Considering certain sub-criteria, the different perspectives within the particular discipline have been discussed. In brief, there are many ways to understand cities and their growth.

This section then presents mapping perspectives from seven different disciplinary backgrounds to be used as alternative approaches in creating the city growth narratives. The mapping of perspectives is developed using a populated table of classifications in previous sections. Each map of perspective is then depicted through a perspectives diagram that is shown in seven figures as follows.

These diagrams are created by connecting each filled cell to others following the classification table created in the previous step. All of the diagrams show that there are many possible approaches within a specific discipline which can be used in understanding the growth of the city.

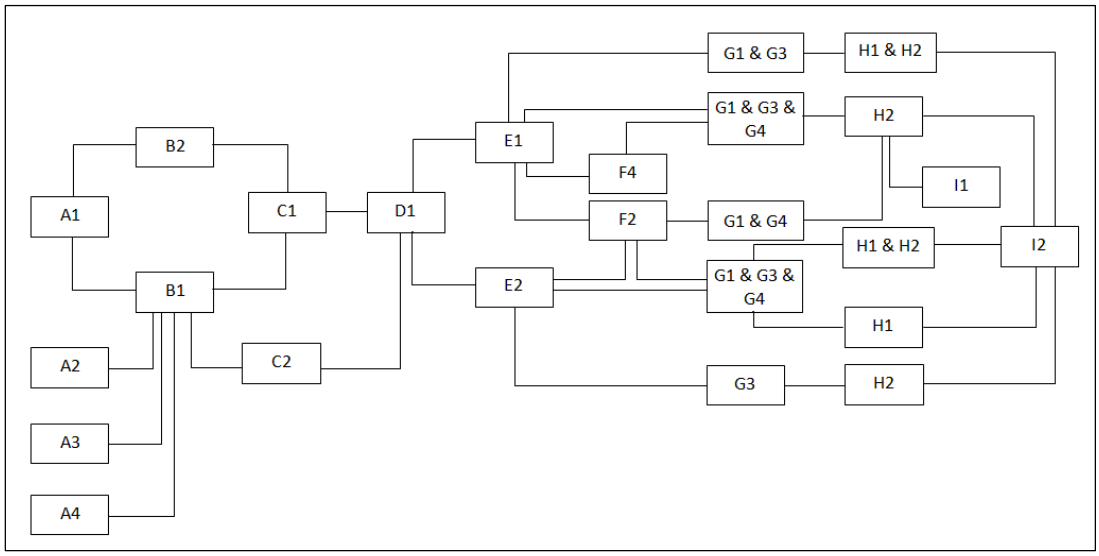


Figure 5.1 An approaches diagram of certain transport studies' perspectives

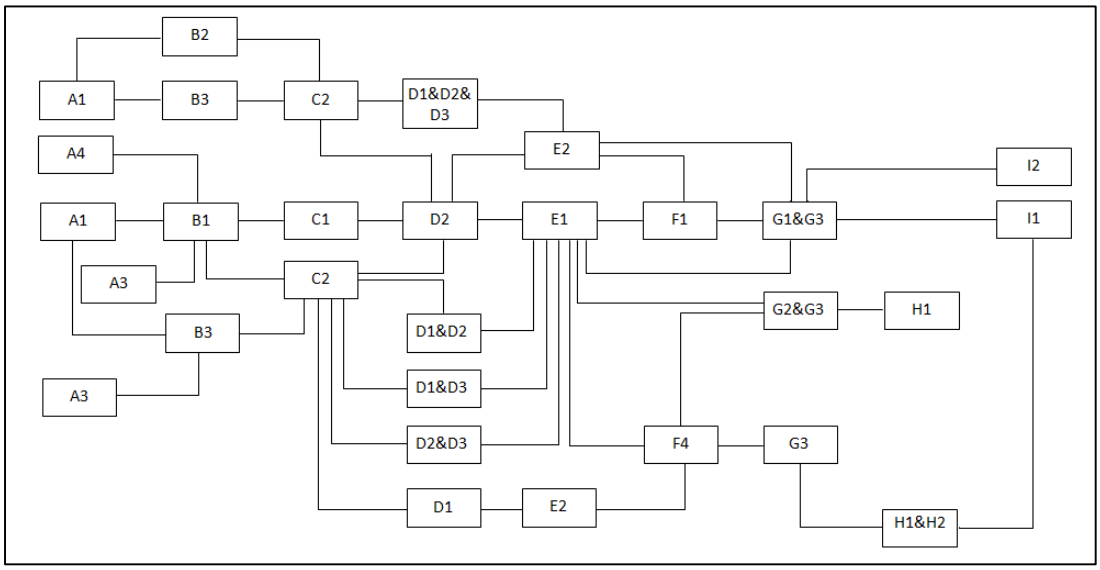


Figure 5.2 An approaches diagram of certain economist's perspectives

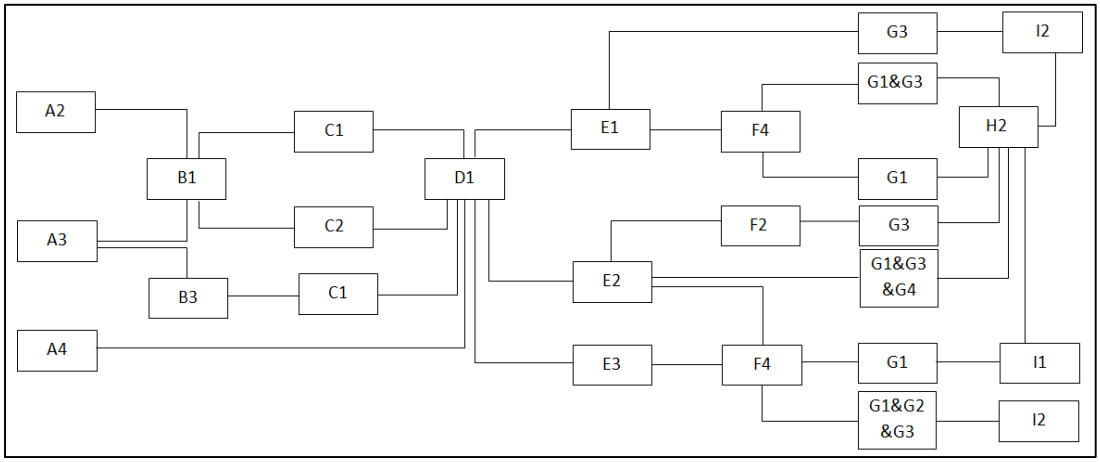


Figure 5.3 An approaches diagram of certain geographers' perspectives

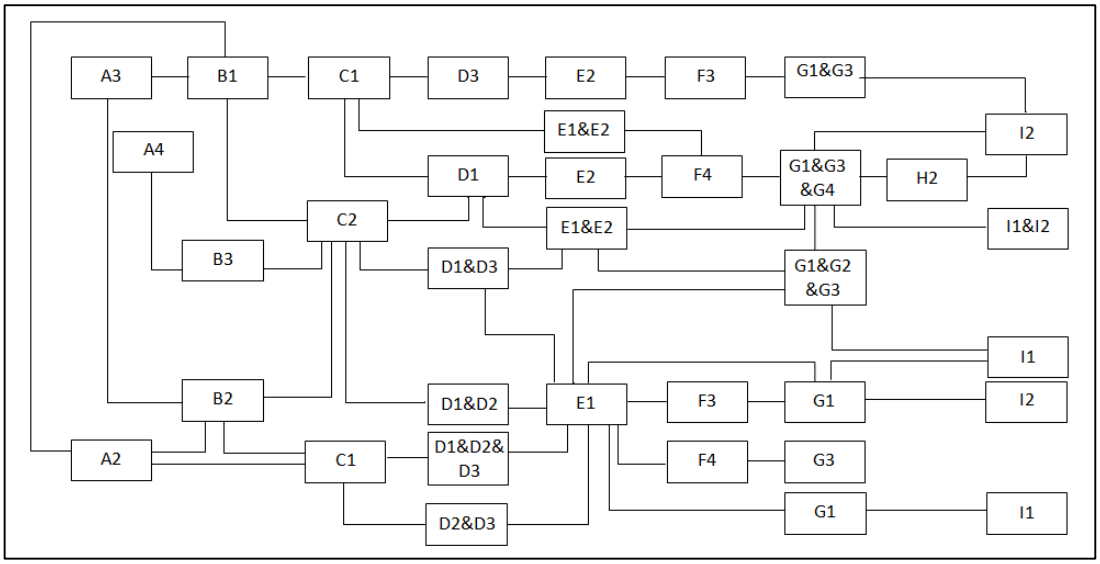


Figure 5.4 An approaches diagram of certain economic geographers' perspectives

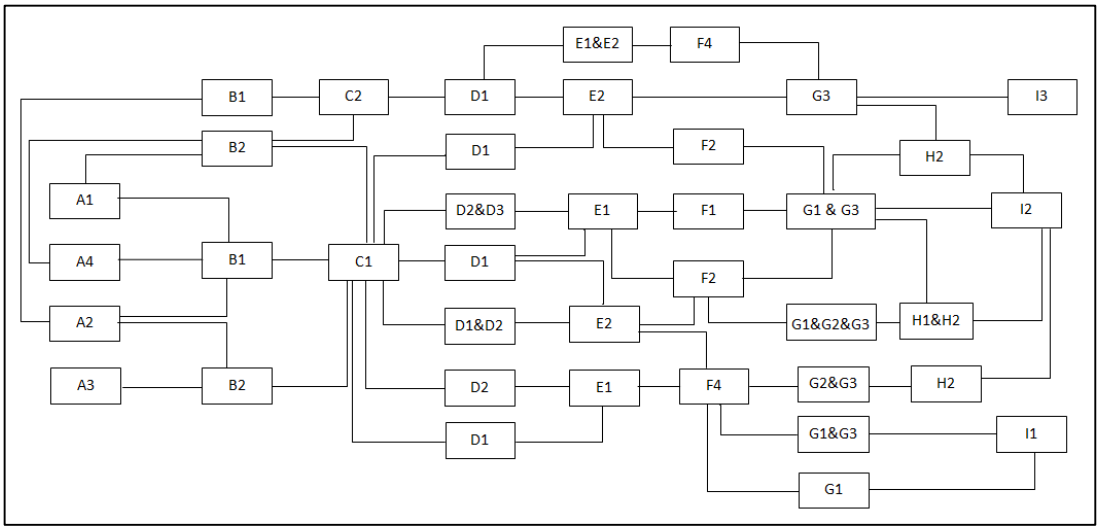


Figure 5.5 An approaches diagram of certain urban planners' perspectives

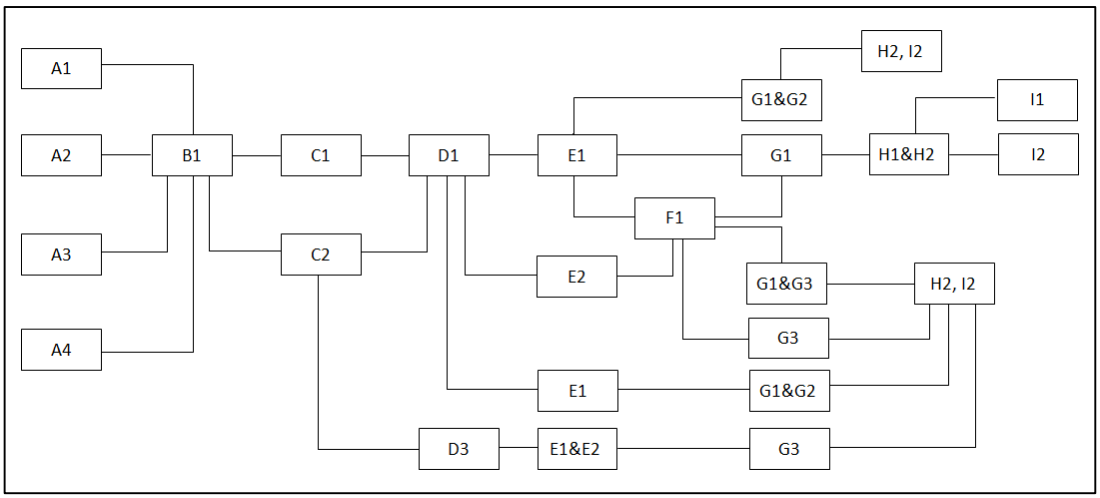


Figure 5.6 An approaches diagram of historians' perspectives

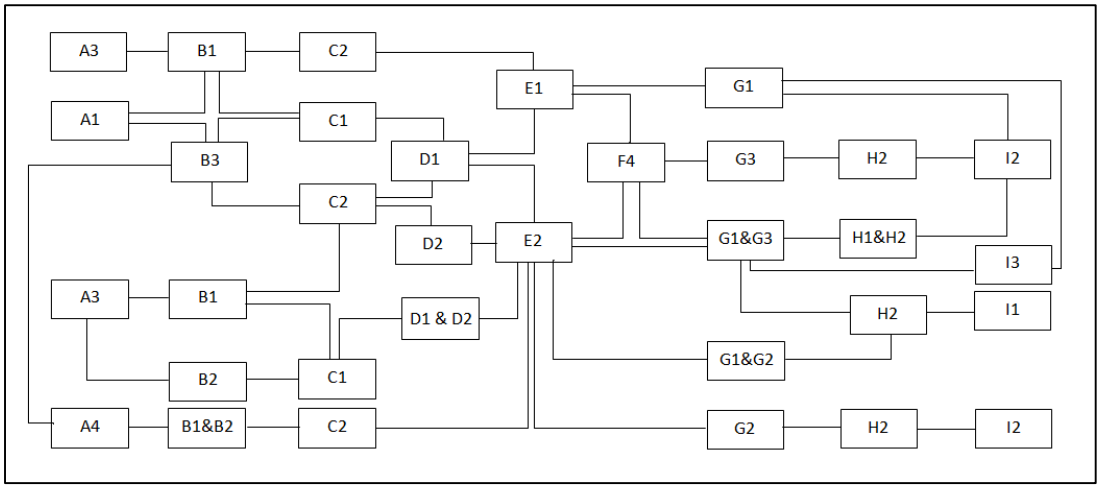


Figure 5.7 An approaches diagram of certain sociologists' perspectives

The diagrams represent a set of approaches. However, they are separated into their own way of thinking behind disciplinary perspectives. This is how the multidisciplinary approach can be drawn. As those diagrams represent different points of view in seeing the growth of the city, the varied diagrams cannot be superimposed. However, for further research that incorporates an interdisciplinary approach the diagrams might be superimposed in order to gain a synthesised perspective from different disciplines.

Chapter 6: Introduction to Case Study: Case Studies' Role and Introduction to Indonesian's City Case Study

6.1. Introduction

This chapter introduces the case study examined in this research. Case study as a research method helps to understand phenomena in the real world. A case study provides empirical evidence and brings theories into condition of the real world. Moreover, Yin (2009) states that a case study is performed to understand a complex phenomenon. Therefore, the complexity of city growth regarding several causal factors and experienced problems represent the complexity of understanding the city itself. Furthermore, Yin mentions that an advantage of using a case study is that it deals with a variety of evidence, e.g. documents, observations, interviews, etc. The case study, moreover, supports research when the researcher has no control over data and evidence. Therefore, the evidence is used for verifying a set of concepts created from different disciplinary perspectives.

In implementing the methodology to create a city growth narrative development, this research uses a city as the key unit of observation. A case study is expected to be able to define the relevant approach to be followed. This chapter will then present the role of the case study and its description in this research. Using a case study, therefore, becomes a strategy to conduct this research study in order to achieve the research objectives mentioned in Chapter One.

As explained in Chapters One and Three, this research focuses on both past and future city development. Thus, some related data and evidence from the past and the future need to be collected. This information helps to understand the long term development and the characteristic of a particular city.

The remaining sections in this chapter present the case study position in this research, the justification of choosing the case study cities used in this research, and the chapter conclusion. The justification of the case study city includes considerations in choosing both an Indonesian city and a city at the secondary city level in the Indonesian city system hierarchy.

6.2. Case study cities position in this research

The methodology diagram presented in Chapter Three places the case study as an important step. It bridges the generic framework into a specific implemented area and demonstrates the implementation of the created methodology in a real situation. Hence identification of specific events and causal factors in city growth are explored from some resources. The text below presents the role of the case study related to the whole research methodology and some resources from where the information taken.

6.2.1. Case study's role

A case study city is an essential element in this research. The selection of a relevant combination of sub-criteria, that later defines the chosen approach, is determined by the characteristics of a particular case study city. Some events can be defined as the variables when they provide significant effects on the growth of cities. These effects are, for example promoting activities, generating the emergence of new land use and infrastructure provision, issuing policies, etc. Mentioned in Chapter Two on Figure 2.1, some factors would be able to generate the growth of cities and determine whether it experiences compact or sprawled growth. In this regard, Bhatta defines two types of growth: compact growth and sprawled growth. Compact growth refers to the increasing role of the city as population and activities concentration, while sprawled growth refers to un-designed city growth.

A number of possible sub-criteria combinations resulted from the previous steps of research methodology. This is applied to a real-world city condition in order to pursue the narratives for city growth. The characteristics of the case study city define a set of sub-criteria that will be used as considerations in developing a causal loop diagram for a particular discipline's point of view. However, since a set of approaches are distinguished into different disciplinary perspectives, different points of view in seeing some specific events that influence the growth of the city over time are affected.

A case study city as a source of evidence provides many events in accordance with the changes in the city. In order to understand the city evolution and growth process over time, the evidence is collected following the growth progress of the city. The next subsection presents the construction of information from the case study cities' evidence.

6.2.2. Constructing the information from case study cities

In identifying the case study cities characteristics and their development, a large amount of data and information are needed. Different types of data sources are used for describing the emergence of city growth and development. The use of some different types of sources is helpful to corroborate the information and the evidence needed in this research (Yin, 2009). These sources include books and academic papers, archives, and formal documents as explained below:

a. Books and journal papers

Books and journal papers are considered as reliable works of literature in understanding city growth theories with regard to transport development. The books and journal papers cover some disciplinary perspectives that are taken into account as the related disciplines.

b. Archives

This type of data is taken from both libraries and online resources. Some online manuscripts, databases, and maps can be downloaded from numerous reliable websites for examples http://tropenmuseum.nl/, http://www.anri.go.id/, and http://www.bps.go.id. These documents explain development and city condition over time through evidence and the emergence of events.

c. Formal documents

Formal documents refer to the types of government documents that are related to this research such as the documents that contain government policies, city development direction, and city planning.

Regarding the required data and information explained above, two steps need to be undertaken:

(1) Collecting the required documents

Some data types mentioned previously are collected both through fieldwork and online searching on the internet.

(2) Collating the pieces of information in time order

In order to understand the city evolution over time, it is suggested that the evidence is organised sequentially. It is expected to help grasp the whole picture of growth of the through the development overtime. The sequential events are also used for constructing the event diagram in Chapter Seven.

6.3. Choosing Indonesia as the location of the case study city: an emerging country

The economic growth of Indonesia has placed this country among the 11 Asian countries which have demonstrated a consistently high economic growth rate since 1990. Therefore, it has already reached the middle-class income status and together with PRC, India, Japan, Republic of Korea, Malaysia and Thailand is assumed to be leading Asia's rise in the years to come (Asian Development Bank, 2011). The development of Indonesia is supported by the growth of its cities. Their growths have been changing in term of the population, growth of urbanised area, spatial and economic growth (Goh and Bunnel, 2013). Indonesia's population has significantly increased from 205.13 million in 1990 to 237.64 million in 2000 and rose from a growth of 1.40% (1990 – 2000) to about 1.49% (2000 – 2010) based on the national census (Badan Pusat Statistik, 2013). The increasing population provides a significant influence on land use. This increasing population has raised the use of built up area along the population spread area.

Aside from the factor mentioned above, there are several points that make Indonesia (its area is presented in Figure 6.1) an interesting country to be seen through its cities. Firstly, Indonesian's former cities growth were influenced by the western cultural pattern. This is because Indonesia had been under colonialism for hundreds of years. The Indonesian cultural characteristics however still strongly influence the cities' further growth. Secondly, Indonesia is also known as the most culturally heterogeneous country in the world that has been influenced by the globalisation phenomenon. Some of its cities have become world cities with their global network, especially in trading and manufacturing. Thirdly, Indonesia is concerned with the decentralisation policy, particularly since the implementation of Law No. 22/1999 about regional governance. Through this law, Indonesia started to carry out the mandate of the state constitution regarding equity development for the whole country area (Mungkasa, 2003).

Figure 6.1 Map of Indonesia

6.4. Choosing an Indonesian city as the case study city

6.4.1. The Indonesian cities

Most Indonesian cities grow their privilege access through inter-city transport (Tirtosudarmo, 2010; McGee, 1967). Therefore, the cities that initially grow are found in coastal areas, since they have naturally been given the benefit of water transportation either by sea or river. The given condition has shaped the basic characteristic of those cities. However, in recent times, their characteristics can possibly be changed for a number of reasons e.g. the transformation of other cities, degradation of major city activities, and the increase of undefined activities. The other type of Indonesian city is inland cities that initially rely on agricultural activities. These cities are located in the inner part of the country, away from the sea. Historically, the inland cities grew slower than the coastal cities since the latter experience dynamic growths (Nas, 1986).

In a study of Indonesian cities presented in Nas (1986), early Indonesian cities were roughly distinguished into two types of city: coastal cities and inland or agrarian cities.

Coastal cities rely on their growth through water transport. Therefore they have traded as their basic life activities. The existence of water transportation supports export and import activities from their ports. On the other hand, inland cities have agricultural activities as their primary form of livelihood. This basic characteristic influences further cities lives, covering the social structure of the society, morphological structure, and transportation as well as the development of cities over time.

The role of cities in term of Indonesia refers to their function as places where both settlement and socio-economic, political, cultural, and administration activities are concentrated (Bappenas Republik Indonesia, 2002). A city is also expected to be an active agent in generating and stimulating the growth of the surrounding rural areas in accordance with the national rural-urban linkage policy.

Regarding the city system, Indonesian cities are structured by three types of centre namely the national activity centre, regional activity centre, and local activity centre (Setneg Rep. Indonesia, 2010). According to their names, each centre of activity has its own function to generate and grow its geographically influenced area. The function and basic facilities that should be provided in each centre are presented in table 6.1.

Table 6.1 Function, role, and basic facilities need to be provided in each hierarchy city

Type of centre	Function	Basic provided facilities
National activity centre (NAC)	• To serve international and national as well as its service to its province itself • As a centre of financial service with national scope • As a centre of collecting and processing activities for at least a province region • Node/interconnection point for both national transport and a number of interconnected provinces • As a centre for civic service and public service in the national scope	• First-class of airport and seaport • Central regional market • The first level of hospital • University

Type of centre	Function	Basic provided facilities
Regional activity centre (RAC)	• To serve the activities with province scale or region scale • To push and generate the growth of its influenced region • As a centre of collecting and processing activities for province region • Node/interconnection point for the province transport network • As a centre for civic service and public service in numbers of cities and regencies	• The second level of airport or port or bus station • Regional central market • The second level of hospital • University
Local activity centre (LAC)	• As a centre of local - collecting and processing activities in each municipal and numbers of districts • To support the RAC function and reduce the direct rural to NAC movement • As a centre of collecting and distribution for local scale and its hinterland	

Source: (Ministry of Justice and Human Right, 2008)

6.4.2. Choosing an Indonesian secondary city as the case study city: An overview of decentralisation policy in Indonesia

Decentralisation in Indonesia is a product of Indonesian policy development. It is influenced by the previous governments' administrative activities that are determined by the shift of history over time. In this regard, Indonesia experienced the colonialism period, the old order period, the new order period and the reformation period. The new order period was the longest time when government administrative activities implemented a centralisation system. This system has greatly influenced the convergence growth in big cities and the concept of top-down growth during 1965-1998 (the new order period). The emergence of disparities between big cities and other types of cities has resulted in a policy based on the development equity objective, namely the regional autonomy policy. The regional autonomy policy has been implemented in Indonesia since the socio-politic reformation occurred in 1998. The regional autonomy was seen as the finest policy approach in managing a very large geographical area of Indonesia. It was addressed to cope with the various characteristics of the regions with their different resources. This policy was later outlined into two legislations: (1) Law No.22/1999 about the regional government and

(2) Law No. 25/1999 about the central and local government financial balancing which was then revised by Law No. 33/2004 (National Development Planning Agency, 2002; Miller, 2013).. Both sets of enactment gave more authority to the local government to manage their own resources, including civil services, in order to develop their area based on the national regulations, norms and standards (Sekretariat Negara, 1999). There are three principles of regional autonomy policy implementation-that are basically aimed at transmitting power, functions and resources from the central government to the regional government, namely: (1) decentralisation, (2) deconcentration and (3) devolution.

Decentralisation literally means that the authority is given to the local government from the central government. Deconcentration principle places provinces and municipals or regencies as the central government representatives. Meanwhile, devolution is the duty for the lower-level government to carry out the upper-level governance duties with the obligation to take account of what is assigned. As mentioned previously, these three principles allowed each region to manage and develop their own region based on their characteristics. Since its implementation, the decentralisation policy has significantly increased the regional economic growth in most Indonesian regions (Sasana, 2006). Furthermore, the decentralisation policy is expected to give some impacts: Firstly, the decentralisation might increase the proportion of total expenditure devoted to social and economic infrastructure and, within these broad categories, to favour basic social services and small-scale infrastructure projects. Secondly, the decentralisation may increase economic participation by shifting the focus of expenditure towards small scale infrastructure projects, thereby encouraging growth in the medium and small scale private sector, as well as allowing people greater control over decisions which critically affect them. Thirdly, the greater efficiency in resource use is a possible consequence of the decentralisation: the size of the bureaucracy may be reduced and decisions are made closer to the location of projects, although this may be offset by the economies scale. The efficiency gained may be quite large for Indonesia because of its considerable heterogeneity and the likelihood that the central government does not have any sufficient knowledge of all the local conditions. Lastly, the decentralisation may increase the equity of expenditure distribution within localities. However, interprovincial equity can be expected to depend even more on central government redistributive measures (Ranis and Stewart, 1994 p.53).

This research selects Purwokerto city, based on the reason of its essential position as a secondary city in the development of Indonesian cities and based also on the pragmatic reason for the ease of collecting the data. Purwokerto is a city located in the Southwestern Central Java Province. It has grown as a regional activity centre that serves its surrounding regions. Purwokerto also gets the privilege of its position as a regional transport node that links cities in Java Island on the southern part. Considering the current city development paradigm in Indonesia that emphasises regional equity development, this discourse stresses the second hierarchy level of the Indonesian cities system. The second hierarchy level cities are expected to stand in between the wide service area of the first level (national activity centres) and the absorptive function of the local centre. The development of the second level cities, therefore, will shape the region's development. It is in accordance with the decentralisation programme currently implemented in Indonesia. The capacity of secondary growth centre cities is to reduce the burden of the primary cities centre's growth (referring to the national activity centres in Indonesia city hierarchy) (National Development Planning Agency, 2002). The development of the secondary cities is also to strengthen the rural-urban linkage that will be applied by increasing the role of the secondary cities as the centre of distribution and collection of resources.

6.5. Brief description of Purwokerto as the case study city

This section presents a brief description of the current condition of the case study city, Purwokerto. As it is a result of a long term development, the characteristic of Puwokerto will be identified covering the population and its rate, livelihood, land use, and transportation.

Historically Purwokerto grew firstly as an inland city while it is currently developing as a service city which functions as the growth centre in the South-West part of Central Java Province region. It represents an inland city that firstly grew as a supporting region for a bigger city but recently became an industrial city. This phenomenon seems quite common for small Indonesian cities. They initially grew through industries as the promoting factor for city development. The industrial activities play an important role in accelerating growth as well as their absorptive function (Zahnd, 2006).

Purwokerto city, as seen in Figure 6.2. cannot be separated from Banyumas regency

since Purwokerto is the capital city of Banyumas Regency. The development of the capital is influenced by regency and vice versa. In this regard, Purwokerto is stated as the main growth centre for Banyumas regency as well as for the Southwest part of Central Java Province. Banyumas Regency, therefore, is the hinterland for Purwokerto city.

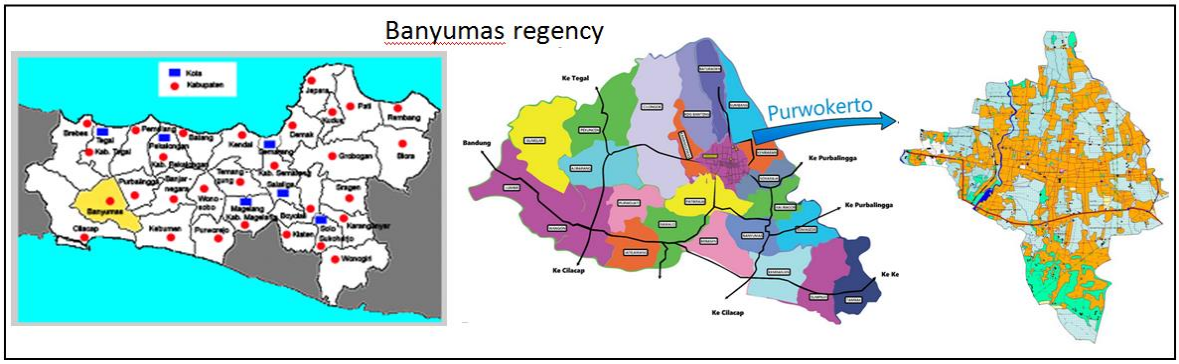


Figure 6.2 Purwokerto city

This figure shows the position of Purwokerto city in Central Java Province administration map. It is the capital of Banyumas Regency, one of a few regencies in the south-western part of Central Java Province

Purwokerto is located south of Mount Slamet, one of the active volcanoes in Indonesia, and it is situated about 200 km from the provincial capital (Semarang). Once Purwokerto was declared as capital regency in 1963, it grew faster than its surrounding region-Banyumas regency. This is because of the growth of population, economic, and urban activities.

Purwokerto had a population of 373,301 in 2009. With its 821.73 km^2 width area, it has the population gross density of about 454 pop/km^2. The population characteristics have become more heterogeneous since Purwokerto grew as an education city and has become supported with the presence of some universities. These students later bring their own local cultures to Purwokerto.

The increasing number of the population is in line with the need for housing. Therefore the growing number of population also drives the expansion of settlement areas in most Purwokerto area. In this regard, Purwokerto, like most Indonesian cities, has a horizontal housing type. Consequently, the rise in housing needs is also comparable with the widening of the land cover.

Figure 6.3 shows the regional transport system that connects Purwokerto to other

places, mainly in Central Java province. In this regional network system, Purwokerto is located in the middle of Java Island that geographically connects the western and eastern area and also links the northern and southern areas. In other words, Purwokerto has a strategic location that is obviously significant in accelerating Purwokerto's growth (it will be shown further in Chapter Seven).

Figure 6.3 Road and railway system in Central Java Province

Borrowing the recent Banyumas Regency's economic data, there is an increasing growth (1.22 %) per capita income from 2009 (5.49%) to 2013 (6.71%) (BPS Kabupaten Banyumas, 2014) The economic data also describes the changing economic structure in this area i.e. the decreasing percentage of the primary economic activities from 23% in 2009 to 20 % in 2013 and the increasing percentage of tertiary economic activities from 51% in 2009 to 54% in 2013. These changes indicate the shift of economic endowment structure in Purwokerto. Furthermore, it would also picture a change in people consumption orientation; from agricultural consumption to industrial ones (Pasaribu, 2005). The changes in the city also depict the land use alteration as shown in Figure 6.4. It shows that Purwokerto has an infill growth type. Infill is a type of growth of a city and happens when an unbuilt area converts into built

up area (Bhatta, 2010). The need for housings and buildings to accommodate the city's activities and infrastructure has generated the increasingly of converting of dry field and wet filed into built-up area. In particular, the built-up area has currently been spreading to the south, east, and north.

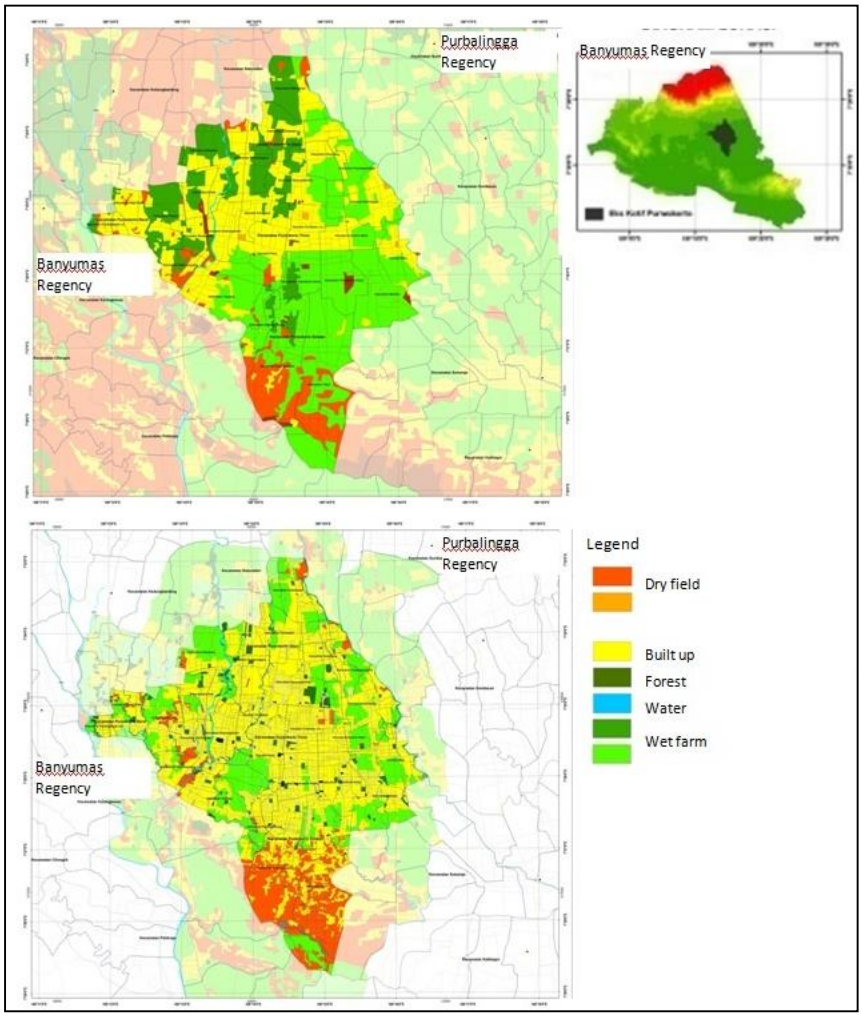


Figure 6.4 Purwokerto's land use in 2000 and 2010 (Sekretariat Daerah Kabupaten Banyumas, 2014)

Regarding city transportation, the level of vehicle ownership has increased as recorded in Table 6.2. Motorcycle dominates the vehicles ownerships in Purwokerto over time together with private car, and motorcycle ownership also grows constantly every year. Meanwhile, other types of vehicle ownerships tend to decrease as presented in Figure 6.5.

Table 6.2 Numbers of Vehicle in Purwokerto during 2001 - 2005

Vehicle	Year				
	2001	2002	2003	2004	2005
private car	10318	10858	11867	12520	12848
public service car	768	797	913	923	800
private bus	155	158	164	165	176
public service bus	777	867	981	935	505
private truck	6763	7175	7836	8106	6858
public service truck	144	146	147	140	97
motor cycle	75606	86646	102620	118415	111037
Total	94531	106647	124528	141204	132321

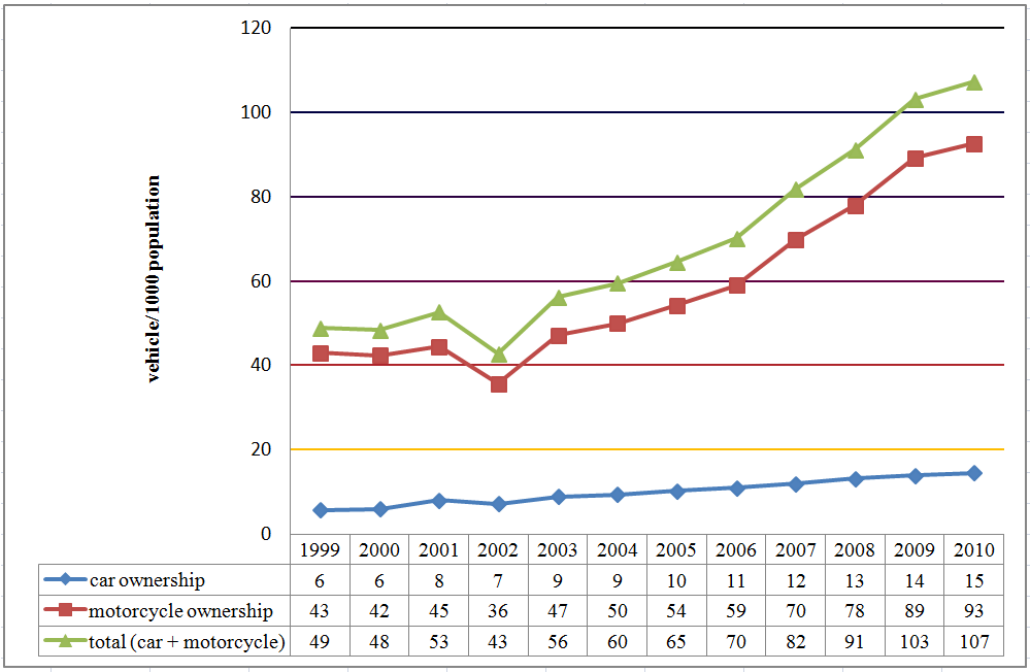


Figure 6.5 Trend of vehicle ownership in Purwokerto

Source: Banyumas Regency in Figure 2006

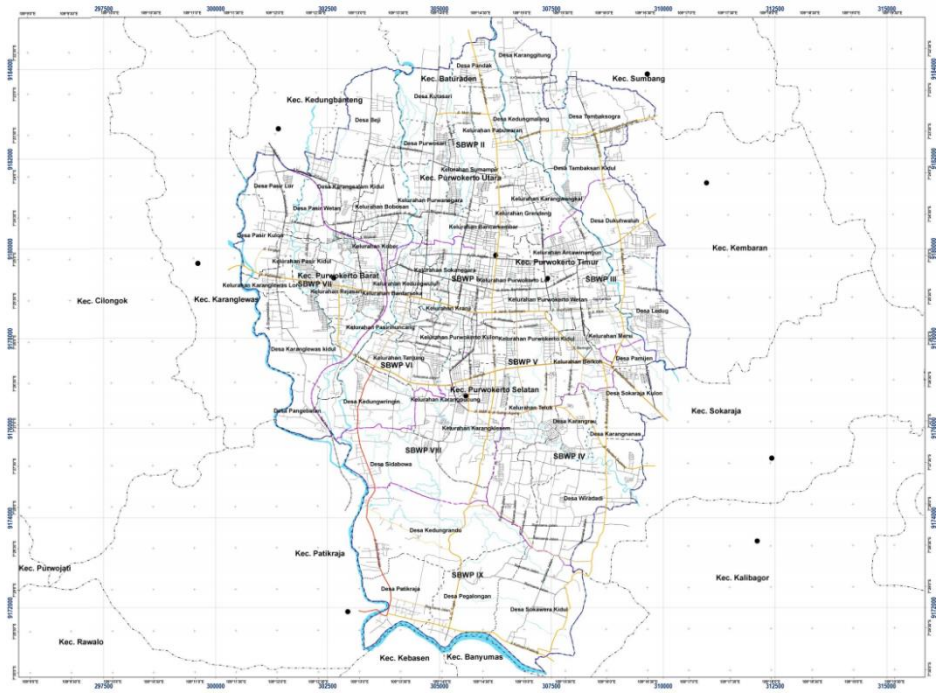


Figure 6.6 Purwokerto City's structure (Sekretariat Daerah Kabupaten Banyumas, 2014)

In relation to the city structure, Purwokerto is a polycentric city. It has one main city centre and some sub-centres as seen in Figure 6.6. The main centre functions as the centre of commercial activities and is located exactly in the middle of Purwokerto city. These sub-centres are distributed into 6 development areas. Purwokerto spatial planning divides the Purwokerto area into 9 development areas with the main centre located at three development areas, namely development area I, V, and VI. The other development areas become sub-centres with different functions, e.g. settlement, education, civic, etc. (Sekretariat Daerah Kabupaten Banyumas, 2014). Therefore, Purwokerto is a polycentric city with one main centre and 6 sub growth centres.

6.6. Conclusion

Defining a relevant approach regarding the city's own characteristics makes a method more applicable. It is because a method is faced with the real city condition. Moreover, a specific perspective which would be appropriate for a particular city characteristic will likely be chosen. As there are many different disciplinary perspectives for the growth of the city, the case study city in this research is an essential element (regarding theoretical perspectives) to define some variables relevant to the particular city. In

simple words, the defining perspective is based on evidence (evidence-based approach).

In order to create a full story of city development, evidence in every stage of city growth is obviously helpful. Indonesian cities in this regard, are good case study cities as they are dynamic and in the early stage of their fast growth period. There are also effects of different political implementations over time.

In the data collection, however, there is a need to be aware of the data availability dealing with the lack of recorded events. This condition could be overcome with some other supporting information from many different sources such as articles and books that have a particular time setting on them.

Chapter 7: The Past Narratives of Indonesian City

7.1. Introduction

7.1.1. Past narrative position in the thesis

This section is part of the development of the past narratives section presented in the methodology diagram (Chapter Three). As the methodology contained a proposed method to create narratives for past and future city development, the following section explains the position of past narratives in the thesis. Narratives are constructed to carefully understand the long term growth of a city considering available empirical evidence from some different disciplinary perspectives. The evidence contains historical facts recorded in various resources. Employing the disciplinary perspective this study is intended to establish academic and logical thinking in depicting the growth of the case study cities. A logical thinking theory is represented by identifying causal relationships between related city growth elements. In this regard, many lessons and valuable information can be learned and provided by historical facts (Kishiue, 2005). Each narrative follows logical thinking from a particular discipline in accordance with the city growth process that will influence their point of view.

Presented in Chapter Four, there are seven disciplines providing extensive discussions concerning growth of the city. However, due to the time limitation in doing this PhD research, this thesis will only use four different disciplines, dropping three of the other disciplines. The four perspectives are transport studies, economist, geographer, and sociologist. This thesis, as mentioned previously, considers a multidisciplinary perspective formed from different disciplines. Those four disciplines are taken because the three of them are a single discipline and the rest is an interdisciplinary that consider then as a single discipline. By doing so, each of the single disciplines is still taken into consideration. However, transport studies which is basically an interdiscipline of its own, is the primary consideration since this thesis mostly deals with discussion in the transport field. Here, even though transport studies is an interdiscipline, it is treated as a single discipline.

Recalling the previous chapters, the transport studies perspectives are concerned with infrastructure provision and related cause-effect within it are employed. Whilst the economists' perspectives are used in this study to consider the capital cash flow

aspect. The geographers' perspectives tend to deal with the aspect of human activity effect on the environment. Furthermore, the sociologists' perspectives broadly discuss the area of human relationships both within and between different societies.

This chapter is conducted regarding the third objective of this thesis, which was mentioned in chapter one, develop historical narratives of the city using the methodological approach from different disciplinary perspectives. It is done by presenting the past development narratives of the Indonesian case study city – Purwokerto. Purwokerto, as described in the previous chapter, is a typical city for a centre of regional activities as determined by the Indonesian city system (Sekretariat Negara Republik Indonesia, 2008). As a regional centre of growth, Purwokerto has a task to its coverage areas laid in the southwestern Central Java province: Banyumas Regency, Purbalingga Regency, Banjarnegara Regency, Cilacap Regency, and Brebes Regency (Sekretariat Daerah Kabupaten Banyumas, 2014). Development of Purwokerto city, however, could not be separated from environmental issues. It relates to economic growth and emphasises the increasing income and revenue by developing economic activities across regions. In fact, it influences an expansion of built up-area and also increases the density of activity that in turn affects the emergence of environmental issues.

7.1.2. Research method for creating the narratives

The remaining sections in this chapter will present narratives from different disciplinary perspectives. In doing so, the writing will be divided into a group of steps from a particular discipline. Each group of disciplines will be presented following the same manner in acquiring the narrative. These next explanations recall the description of each step.

Preparing an approach for the narrative

A combination of sub-criteria from a particular discipline (named an approach) in Chapter Three, is taken and considered to be followed. It is one possible approach from numerous available possible approaches that can be constructed from the combination of diagrams within a discipline in Chapter Five. A set of sub-criteria that defines an approach is chosen for its relevance to the case study characteristics.

The idea is basically a set of sub-criteria must be chosen that are relevant to the case

study characteristics. However, considering that each journal article that populates the classification table represents a perspective in a specific discipline, this process simply borrows a bundle of variables discussed in a particular journal article to be followed. Recalling the classification table, the variables denote the sub-criteria. Each sub-criterion is then matched with the real-world conditions and characteristics of the case study city. Here there is an assessment process to decide and match the information of the case study city with the appropriate criteria and sub-criteria.

The chosen information process is conducted by preparing an interpretation table containing a judgment in choosing sub-criteria in accordance with the general characteristics of the case study city. This is with respect to a particular perspective. It focuses attention on understanding the represented sub-criteria in the case study city. This section will give some additional explanations about city growth variables in the case study city. It is conducted by describing the sub-criteria with regard to the empirical conditions of Purwokerto, as the case study city, to be followed in creating a causal relationship diagram. The idea is that in the case study city's historical growth process, numerous pieces of evidence can be depicted with the sub-criteria. The historical city development hence provides information as supported descriptions to choose the sub-criteria used in the next step.

Creating a causal loop diagram from a particular perspective

A causal loop diagram is a cause-effect relationship diagram containing a set of sub-criteria resulting from the previous step. A diagram is set by linking variables based on a cause-effect relationship. It is created following a way of thinking from a particular discipline. This means that the way to link the variables considers how a particular discipline knits the variables based on disciplinary perspective-logical thinking. The causal loop diagram will be considered in the narrative constructions both for past and future development.

In this process, following the same reason as the previous step (preparing an approach for the narrative) the creating CLD process borrows the logical thinking of a particular journal article. It is based on the assumption that those group of journal articles have the same disciplinary perspective. In doing so, the events or variables from the chosen article can be used as the CLD's variables. The variables are linked by the causal and logical thinking of the chosen article.

Past data/evidence for each discipline

This section explores some important evidence in the growth of the case study city. The evidence is considered to provide significant effects in the city growth process. This information is useful to define the events presented in the timeline diagram.

Compiling a past timeline diagram of the case study city growth from a particular perspective

Timeline diagram depicts certain events that happened in specifically determined eras. Regarding the historical development of Indonesia, there are four main different division eras: i.e. the colonial era (1596 – 1945), the old era (1945 – 1966), the new era (1966 – 1998), and the reformation era (1998 – present). Each era has its typical situation representing its political condition.

Constructing a past event sequence diagram of the case study city growth from a discipline perspective

Constructing an event sequence diagram aims to depict the flow of events in a timely manner following a causal logic from a particular discipline. Therefore the event sequence diagram applies the cause-effect relationship from the causal loop diagram using a collection of events in the timeline diagram. Practically, there is a judgment process to determine the suitable sub-criteria for each event presented in the past timeline diagram. This past event sequence diagram applies the cause-effect relationship from the CLD in linking sub-criteria. The event sequence diagram is then be described in the narrative. Here, the story of city development follows the flow of the past event sequence diagram.

Creating a narrative of past transport and land use development for the case study city

In general, a narrative is written to explain the event sequence diagram. It is presented with some additional information considering the situation at the time it happened. Borrowing the knowledge of producing a narrative from Etherington (2011), the narrative is constructed by involving the evidence from the resources data and knitting it with the personal understanding from a particular point of view.

7.2. Transport studies

7.2.1. Preparing an approach for a narrative from a transport studies perspective

As Purwokerto located in a transport node with an intersection of railway transport and road transport in South-west Central Java, its development is influenced by transport development over time. However, Purwokerto development was started as an indigenous area in South-west Central Java's inland area. An approach concerning Gwilliam's (2003) paper is taken to create a narrative for the case study city. Gwilliam's perspective is likely to close with case study characteristic regarding the subcriteria. This approach contains a set of combination sub-criteria: A1 (Autonomous spatial perspective), B2 (Transport as an effect of city growth), C1 (City planning drives the city growth), D1 (Institution and government policies), E2 (developing countries), G1 (population), (G3) Economic, and G4 (Geographical Boundary), H1 (Number of vehicle ownerships), and I2 (facilities provision).

Recording from its historical development, Table 7.1 presents a number of Purwokerto's characteristics considering the chosen sub-criteria.

Table 7.1 Case study city's characteristic and the chosen sub-criteria from transport studies perspective

No	General information of Purwokerto	Criteria	Sub-criteria
1	Purwokerto's position has firstly encouraged it to utilise its own potential to develop. The presence of a transport network boosts its growth.	Spatial perspective	Autonomous (A1)
2	Transport is provided to serve arising activities and land use development	The role of transport	Transport as an effect of city growth (B2)
3	Development of some new areas is designed to reduce and spread the growth in the former activity centre.	The role of city planning	City planning drives the city growth (C1)
4	Government policies attempt to push the growth of mobility, the economy, and welfare.	Other causes of growth	Institution and government policy (D1)
5	Urbanisation in Purwokerto generates the occurrence of dense and varied activities.	Type of country	Developing countries (E2)
6	• Growth of population in Purwokerto is a consequence of the presence of many universities, in-migration for attracting job provision. • Economic activities in Purwokerto serve a region in the southwest of Central Java Province.	City Definition	• Population (G1) • Economic (G3)

No	General information of Purwokerto	Criteria	Sub-criteria
	• The urbanised area of Purwokerto city has become wider. The increasing area relates to changing of geographical boundaries.		• Geographical boundary (G4)
7	The need for mobility ease is one of the reasons why Purwokerto has a huge number of vehicle ownership. This vehicle ownership is dominated by motorcycle ownerships.	Transport provision	Number of vehicle ownership (H1)
8	The presence of urban facilities improves rapidly along with the growth of population, activities, and economies of Purwokerto.	City characteristics	Facilities provision (I2)

Taken from a set of possible sub-criteria combination diagram formed in Chapter Four, figure 7.1. presents coloured cells that represent a chosen sub-criteria from the taken transport study perspective.

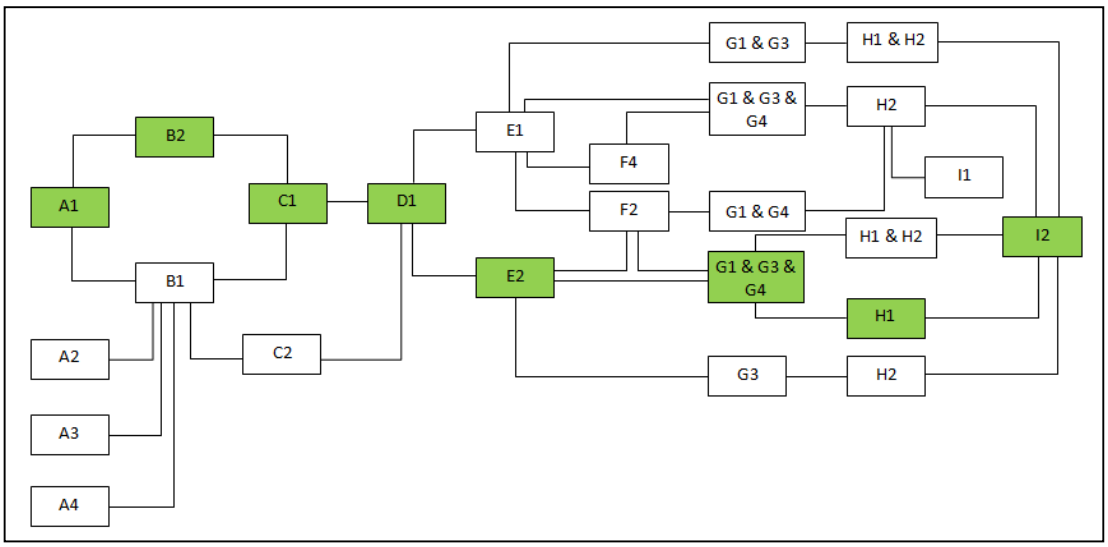


Figure 7.1 A Set of possible combination for city growth from the transport studies perspectives

7.2.2. Creating a causal loop diagram from a transport studies perspective

A causal loop diagram presented in Figure 7.2 shows some variables in the growth of the city and the causal relationships amongst those variables. The cause-effect relationship presented in Gwilliam (2003) is followed to create the CLD in this figure.

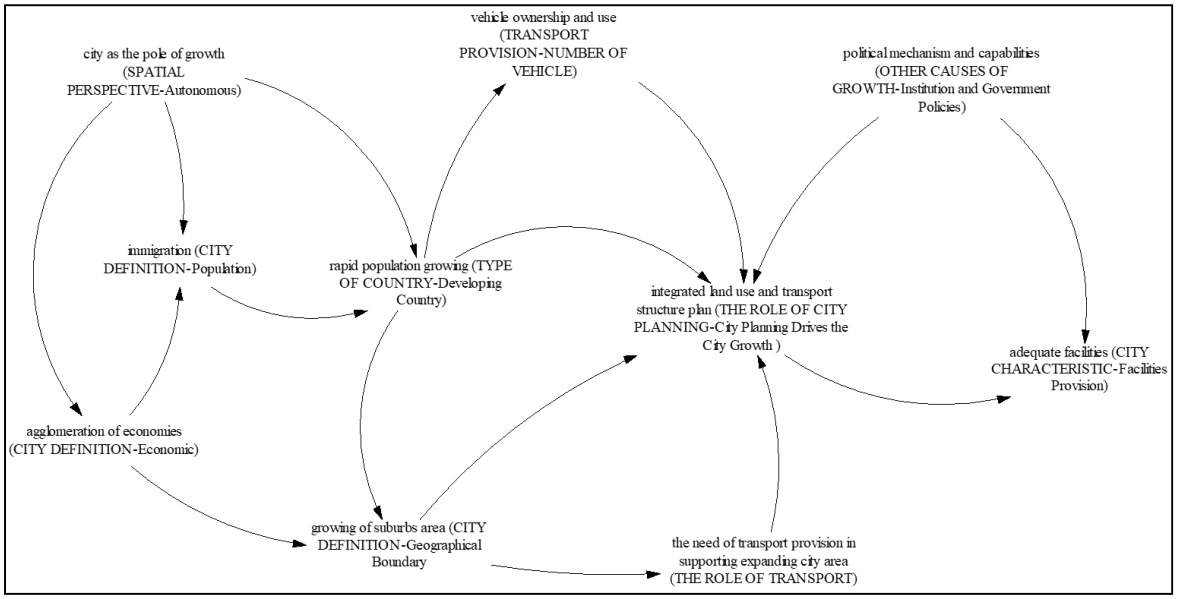


Figure 7.2 A causal loop diagram for the growth of the city from a transport studies perspective

7.2.3. Past data/evidence of Purwokerto from transport studies perspective

In its development, Purwokerto has numerous events with respect to the transport studies perspectives. The early Purwokerto was an Indonesian inland city with poor accessibility. Limited land transport infrastructure and river transport served for both people and goods movement. It is then followed by the presence of railway and road construction that boosted both intracity and intercity mobility and movement.

From Purwokerto's historical development, some evidence can be recorded as mentioned below:

- Construction of railway track in 1838.

  The track connecting Purwokerto as a crop field to a port hub in the north coast of Java. The mainline connected Purwokerto with Cirebon and Kroya then became an essential line to connect Southern of Java with other areas (West Java – Central Java – East Java).
- Construction and improvement of land transportation.

  These constructions aimed to obtain easy transport from the field to the refinery places and from the field to the rail transport. This land construction became the former road for Purwokerto and developed over time as it connected one place to

another within the Purwokerto area.

- The occurrence of new settlement areas and new activities away from the former city centre.

  Some reasons triggered the expansion of the urban area in Purwokerto. Two of those are high city centre density and an increasing number of activities. The presence of those new urban areas was followed by the transport infrastructure demand that connects different places.

- Government policies related to transport development, land use allocation, and people welfare. In some period the chiefs of Purwokerto were concerned about the infrastructure constructions that transport people and goods in different activity centres. Urban development policies also play a significant role in the emergence of job opportunities in Purwokerto that later attract people to come and work in Purwokerto (Mutahir and Makhasin, 2010).

7.2.4. Compiling a timeline diagram of Purwokerto growth from a transport studies perspective

The timeline presented in this section (Figure 7.3.) is depicted from some events which occurred in Purwokerto's development over time.

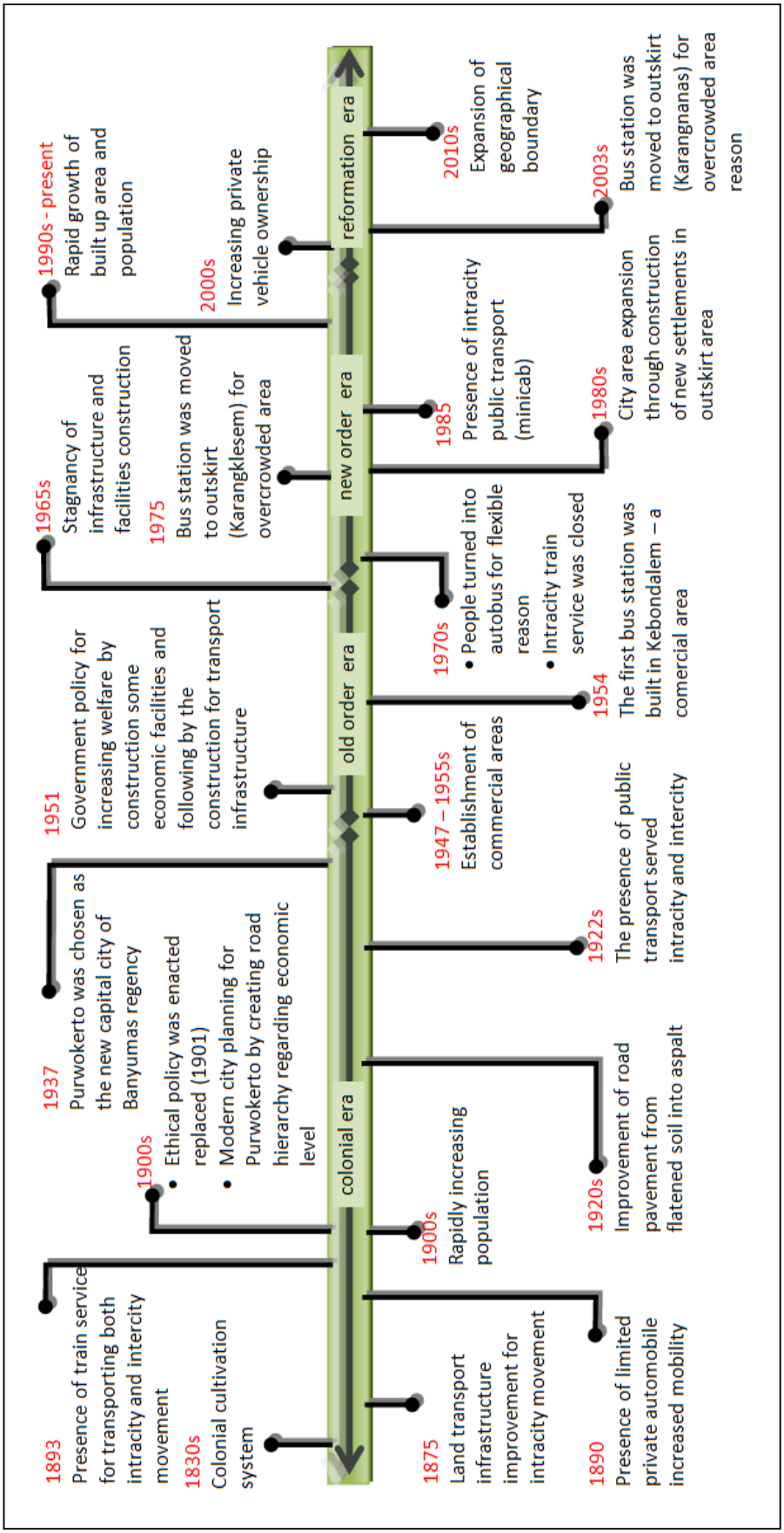


Figure 7.3 Timeline diagram for Purwokerto's city growth

7.2.5. Constructing an event sequence diagram of Purwokerto growth from a transport studies perspective

Regarding the causal loop diagram for the city growth from a transport studies perspective which is presented in Figure 7.2. above, this subsection draws an event sequence diagram. It deals with some events which occurred in Purwokerto's development.

By judging each event to be matched with the concerned subcriteria mentioned in subsection 7.2.1., the occurred events in Purwokerto's development are linked in accordance with the causal relationship as mentioned previously. These events presented in the timeline diagram basically represent a transport studies perspective.

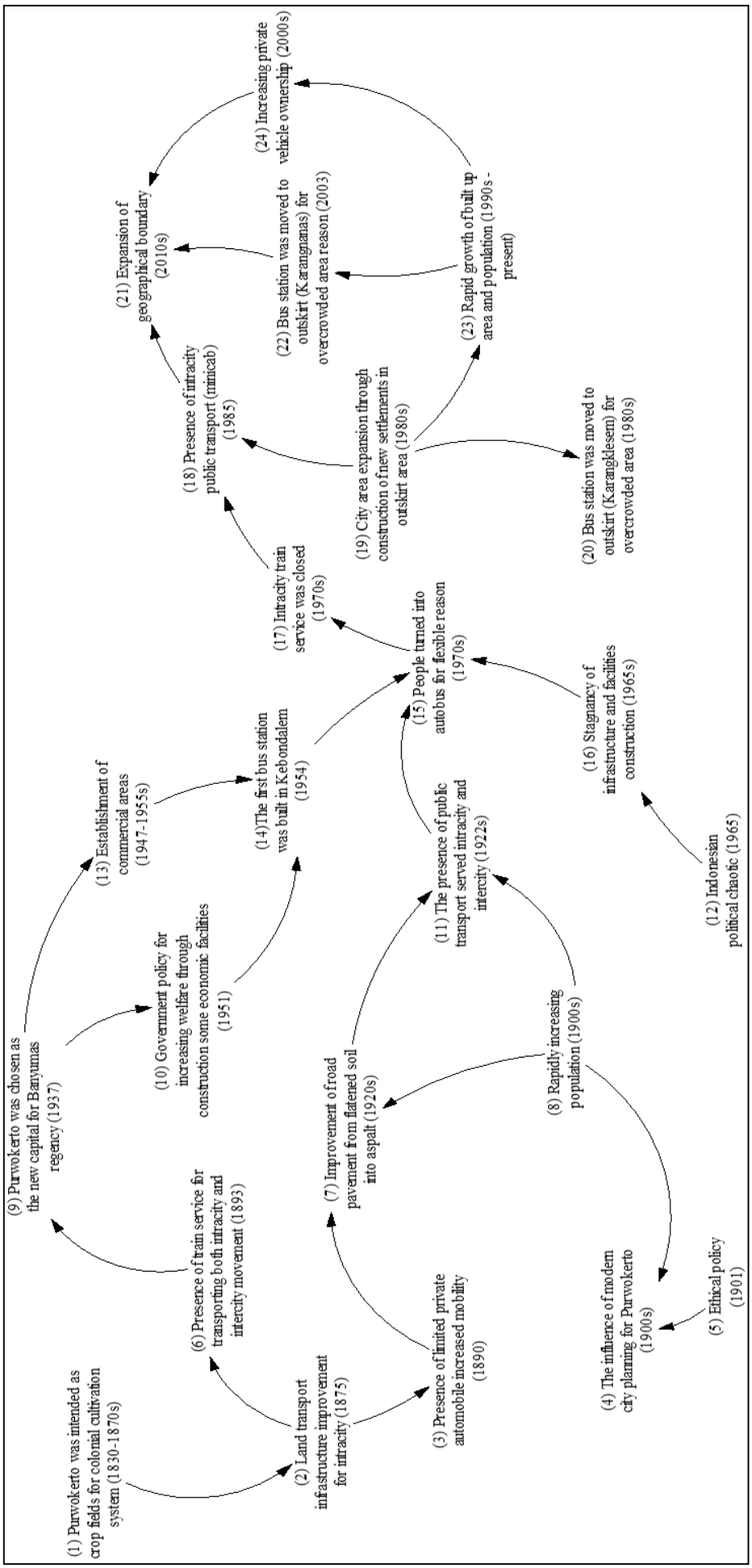


Figure 7.4 Event sequence diagram of Purwokerto growth from a transport study perspective

7.2.6. Narrative of past transport and land use development in Purwokerto

The Colonial Era

This narrative is created based on the recorded evidence and logical thinking from a particular transport studies perspective depicted in Figure 7.4. Following an event sequence diagram presented previously, Purwokerto was first an isolated area for its poor accessibility with regard to the connection to other places. Transportation was then mostly made by footpaths and gravel paths for both intra-city and intercity movement. Horse and horse/cow chart carriage helped people to move from their initial places.

The cultivation system was the colonial policy for Indonesia that forced Indonesia inhabitants to plant some economical crops. It started in 1830 making Purwokerto a city mostly used for crop fields. In fact, the cultivation system policy has given such significant improvement in Purwokerto's development, i.e. transport infrastructure development and socio-economy (Basundoro, 2009). It is explained that bad transport infrastructure was a big issue in the cultivation system in Purwokerto. Using cow/horse chart carriage to carry crops to rivers before being exported through Cilacap seaport was inefficient. Inefficient transportation encouraged the colonial government at that time to construct and improve the intra-city transport infrastructure in 1875[1]. The improvement was especially conducted for some roads connecting crop fields and processing units or factories. Widening and upgrading road construction for those that linked crop fields and processing units or factories aimed to make the transportation easier and faster.

In turn, the colonial government thought to do so for the intercity connections. The first aim was to easily transport agricultural products from the fields to seaports for export. However, the new roads and railway constructions then increased the accessibility of Purwokerto itself. This city became more open and ready to receive the modernity. The construction of De Grote Postweg Van Java (The Java Pos Road) connected some cities in the north coast Java. It was then followed by road track constructions in the Southern of Java connecting Purwokerto together with many

[1] Previously, Banyumas was already connected with some cities in the Southern Java as it was linked by The Pos road in 1843s (Basundoro, 2009).

cities in 1875 (Basundoro, 2009). The first road constructions were to connect Purwokerto to some other cities; in the north (Tegal regency), in the south (Buntu and Cilacap), and in the east (Purbalingga, Wonosobo). These tracks further linked Purwokerto with some cities that had previously passed by the Java Pos Road.

Following the erection of Purwokerto's sugar factory in 1893, the colonial government initially constructed a railway service firstly to connect Purwokerto's sugar factory with some other sugar factories in Sokaraja and Purbalingga in 1897 (Basundoro, 2009; Post and Telecommucation Section Telematict, 2009). Later this railway system as shown in Figure 7.5 then also served passengers from area of service.

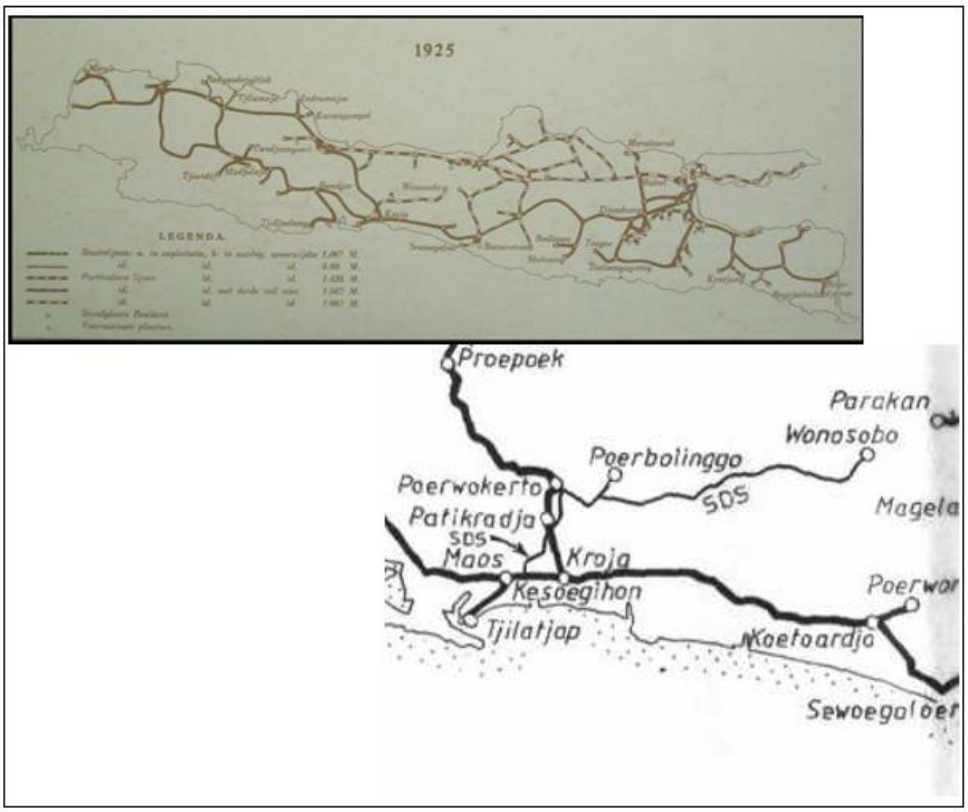


Figure 7.5 Railway network which connected Purwokerto with some other cities in Southwest Java (Source: http://indonesianheritagerailway.com)

A changing political view in the Netherland at the time affected Indonesia with regard to the development policy. A consequence of the political condition was a changing policy from the cultivation system into ethical policy in 1901 (Lindsey, 2008). Using this new policy the colonial government attempted to develop its colony. Improving the city condition with modern city planning was one of the colonial efforts. The city development plan was also driven by rapidly increasing population in the 1900s.

Initiated by Herman Thomas Karsten, modern city planning was implemented for Indonesia. It was a comprehensive city planning that concerned the socio-economic condition in developing city planning (Coté, 2014). Some views in modern Indonesian city planning have influenced the growth of Purwokerto. The establishment of the first city centre containing commercial areas and religious facilities were some of the examples.

Regarding the accessibility and mobility between places, some road improvements were done by upgrading road pavement and constructing some new roads. Following a better transport infrastructure provision in Purwokerto, government authority promoted the public transport that started on 1922.

Its good position in transport connection and better environment then made Purwokerto the new regency capital for Banyumas in 1937. The changing of the regency capital from Banyumas to Purwokerto was also caused by the flood that often happened in Banyumas at the time. As a regency capital, Purwokerto has hitherto developed as a centre of growth for its covered area, especially within the Banyumas regency administrative boundary. Some activities grew in the early city centre. The city centre was reflected by the increasing groups of economic and religious activities in particular places in that area. In order to link the city centre with its hinterland, some transport infrastructures were then constructed and improved.

The Old Era

In its development journey time, Purwokerto has gradually developed. Some economic and social facilities were constructed in the first years of Indonesian independence, in 1947 to 1955s. In relation to the transport infrastructure, Purwokerto bus stations were usually located near the commercial area in accordance with economic reasoning. The first bus station was built in 1954. In fact, groups of economic activities have given multiple effects and delivered an uncontrolled growth level around the bus station area. The density in this area has then made the bus station relocated from its initial location. In this regard, Purwokerto has already had three different bus station locations due to the density of area.

The New Era

The infrastructure development in Purwokerto was unfortunately hampered by the bad national political condition in 1965s. In particular, the infrastructure construction in Purwokerto was stagnant in this period.

Not until the early 1970s the mobility of Purwokerto inhabitants' movements were served by auto bus and train although there were a few people who already had private vehicles. Further, for the reason of flexibility mobility, people preferred to use the bus rather than train. The low occupancy level then became the reason why the train service was stopped at the end of the 1970s (Basundoro, 2009). On the other hand, bus service gradually increased its routes in order to fulfil the transport demand.

The growth of Purwokerto generates the needs for new settlements. In the 1980s two new settlements on the outskirt of the northwest region, Brubahan and Kober were built. These two settlements were then connected with the city centre by new road constructions. Nowadays, these roads become important in supporting the intra-city movement in Purwokerto since they connect the centre of activities of the west and east part of Purwokerto.

The settlement area triggered the growth of other activities surrounding it. Furthermore, the agglomeration of activities around the settlement area created new sub-centres for Purwokerto. In turn, sub-centres were then connected with the former city centres by a new road that generated, growth in the peri-urban area. It started by the emergence of the sporadic ribbon growth along the road. The concentration growth along the road, however, indicates a lack of control from city planning (Laporan Jurnalis Kompas, 2014).

The occurrence of some activities centres and settlements, affected by transport provision, drove the presence of intra-city public transport mode in 1985. This transport mode did not merely support mobility but also played an important role in triggering the growth of Purwokerto's suburbs as it happened formerly. Yet, the need for easier mobility, time efficiency, and business interest initiated people in Purwokerto (just like any other city in Indonesia) to turn to private vehicles ownership.

The Reformation Era

The transformation era gave wider opportunities for enhancing economic activities. This condition then generated the needs for high accessibility and mobility to support people's activities. Supplying the needs of transport in this regard, the number of vehicles increased significantly during this period. Moreover, due to the mentioned needs of mobility, people decided to own private vehicles.

In this era, the bus was moved to a new place for growth reason, the previous location

is shown in number (23) in the figure above. The old place grew then as commercial area and became another centre of activity.

7.3. Economist

7.3.1. Preparing an approach for a narrative from an economist perspective

Table 7.2. is presented to meet Purwokerto's empirical growth with the suitable sub-criteria form economist perspectives. Using economists' point of view taken from Rossi-Hansberg and Wright's (2007) paper an approach involving autonomous growth (A1), transport is an effect of city growth (B2), city planning does not explicitly consider as a factor (C2), institution and government policies (D1), developing countries (E2), monocentric city (F1), population (G1) and economic (G3), and facilities provision (I2) is followed.

Those aforementioned subcriteria, are intentionally chosen regarding the case study city characteristics. Each subcriterion refers to how the perspective puts the subcriterion's role in the growth of the city. Hence, as sub-criteria are inserted into the list, this means that the sub-criteria are recognised to play particular roles in the growth of the city.

Table 7.2 Case study city's characteristic and the chosen sub-criteria from the economists' perspectives

No	General information of Purwokerto	Criteria	Sub-criteria
1	Purwokerto economic growth is largely based on its resources. The growth mostly depends on its own economy rather than relying on other places. Purwokerto becomes the centre of growth for its surrounding areas.	Spatial perspective	Autonomous (A1)
2	Transport service (railways and roads) in Purwokerto are improved to serve certain activities that already exist.	The role of transport	Transports as an effect of city growth (B2)
3	Economic growth in Purwokerto is commonly seen as a result of the agglomeration of activities. It is then followed by the appearance of new activities as a multiplier effect.	The role of city planning	City planning does not explicitly consider as a causal factor in the growth of the city (C2)
4	In its experience of development, some essential activities located in Purwokerto generate the presence of labour to fulfil their employment requirements. In turn, the growth of activities encourages the occurrence of qualified labour which then creates the collection of individual skills and knowledge offering economic value.	Other causes of growth	Human capital (D2)

No	General information of Purwokerto	Criteria	Sub-criteria
5	Urbanisation in Purwokerto generates the occurrence of dense and varied activities.	Type of country	Developing countries (E2)
6	Purwokerto has attracting activities to agglomerate. This agglomeration grows as a compact and dense area.	City/regional type	Monocentric city (F1)
7	The population of Purwokerto has increased and has affected economic activities.	City Definition	Population (G1) and economic (G3)
8	The infrastructure provision has empirically generated the occurrence of activities and play a role in the growth of economic in Purwokerto	City characteristic	Facilities provision (I2)

This perspective will then be referred to and explained in the following coloured code diagram shown in Figure 7.6. Here, the combination of sub-criteria can be associated with the specific condition of the chosen case study.

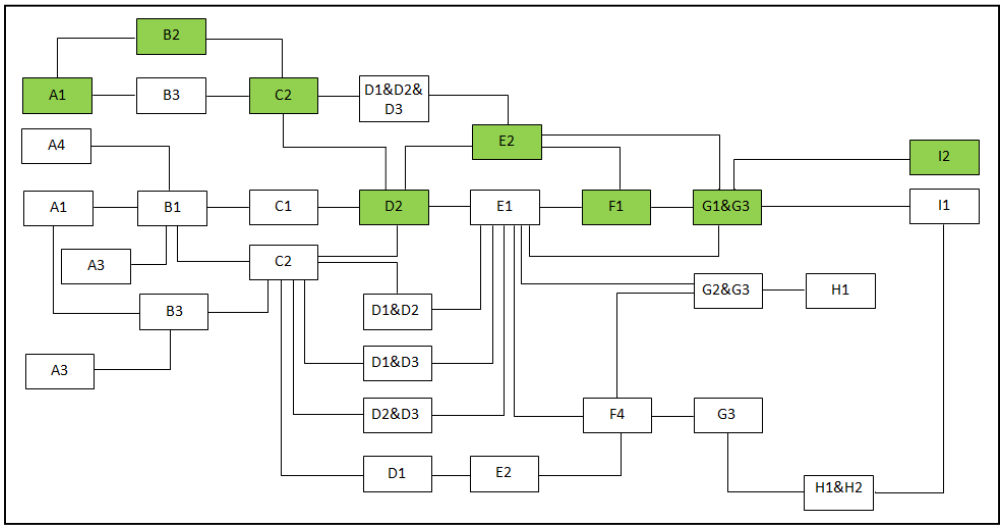


Figure 7.6 A set of possible combination for the growth of the city from the economists' perspectives

7.3.2. Creating a causal loop diagram from an economist perspective

A causal loop diagram shown in **Figure 7.7.** depicts the relationships amongst the variables in the growth of the city from an economist perspective. Following logical thinking from an economist perspective the causal loop diagram below links two variables considering the causal relationship.

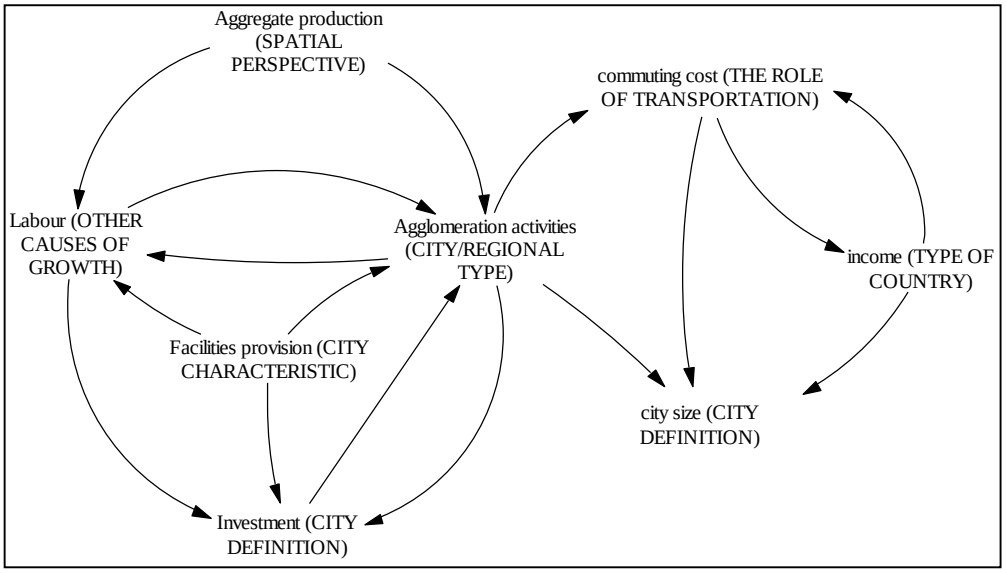


Figure 7.7 A Causal relationship diagram using the economist's perspective

7.3.3. Past data/evidence of Purwokerto from a transport studies perspective

The presented evidence in this subsection indicates the growth of Purwokerto in accordance with the economists' perspectives. In this respect, the growth of the city is seen from economic growth. Therefore its task is to deliver some evidence showing the economist perspective on the development Purwokerto over time.

Purwokerto was initially set to be an agricultural area. During its growth for a long time, Purwokerto has developed into a service city. Purwokerto has now become a regional growth centre in the Southern East of South Central Java according to Central Java province spatial planning. In this respect, Purwokerto has some functions that serve a few different coverage areas. These functions include (Sekretariat Daerah Kabupaten Banyumas, 2014):

- The government centre for Banyumas Regency since Purwokerto is also the place where the capital of Banyumas Regency is located
- The trade and service centre for regional coverage area. Purwokerto has a significant role in stimulating the growth of the economy for its coverage areas (Banyumas Regency, Purbalingga Regency, Banjarnegara Regency, Cilacap Regency, and Brebes Regency). This role is represented by the provision of some economic facilities in Purwokerto.
- The education centre for the regional coverage areas. There are some notable

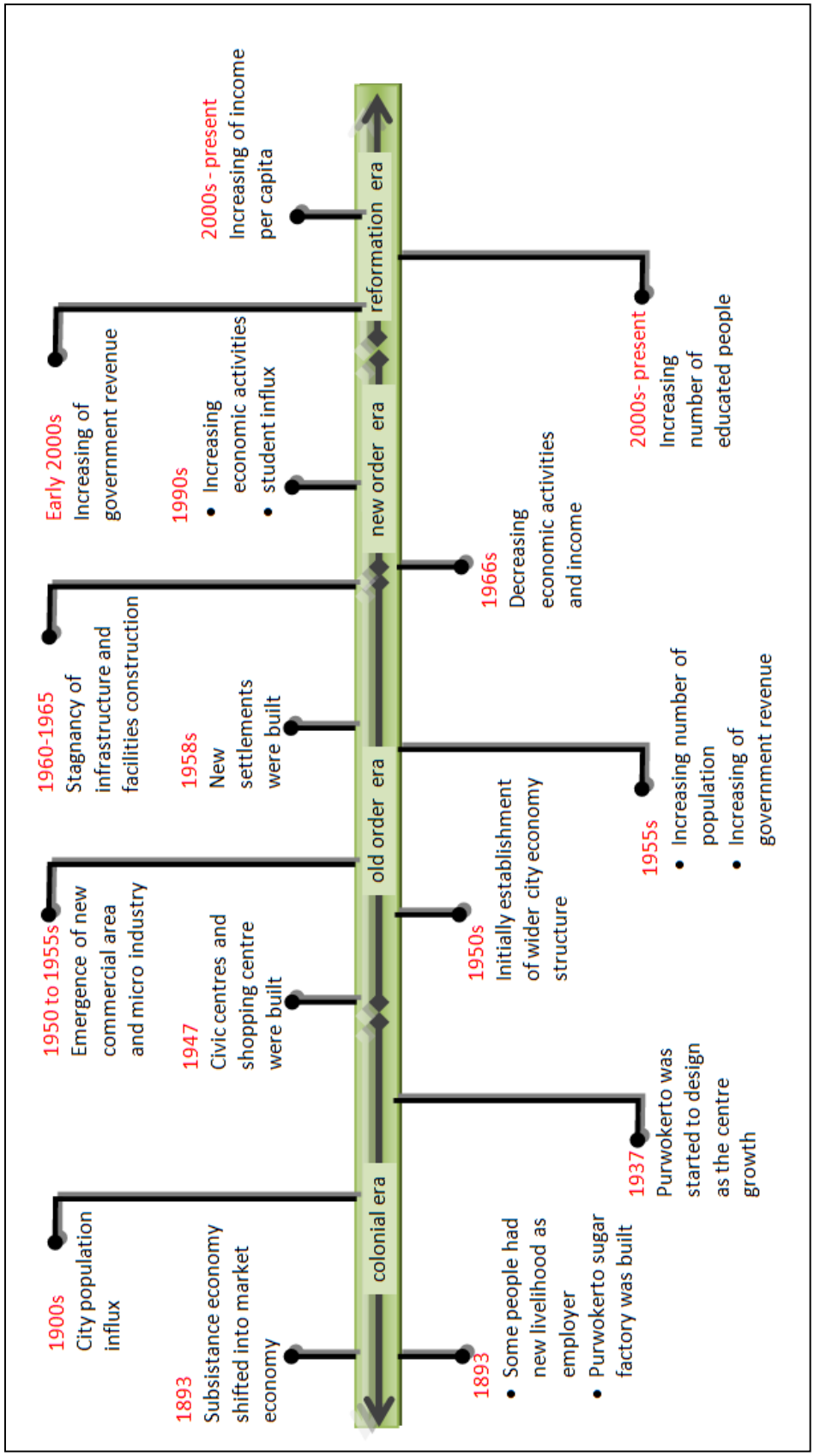
universities located in Purwokerto. The student's existence significantly influences its economic activities.

The development of Purwokerto from agricultural to service city is mostly influenced by economic policies, global economic changes, and endogenous factors. Although varied in the degree of influences, these factors influence the economic changes of development in Purwokerto over time. Some of the recorded events are those that relate to people's livelihoods, per capita income, including the human resource and economic facilities development. As stated by Roy and Ong (2011), the last two mentioned elements highly influence the investment level.

Lack of recorded data becomes a challenge in collecting and determining the occurred events that occurred in Purwokerto. Lots of events obviously took place during the development of the city but in fact, only those that have attracted massive attention and significance that influenced city development over time were recorded either in government documents, academic documents, or other sources. Further, these events are depicted in the timeline diagram presented in the following section.

7.3.4. Compiling a timeline diagram of Purwokerto growth from an economist perspective

The occurring events as the evidence of Purwokerto's growth with respect to the economist perspective are depicted by the timeline diagram presented in Figure 7.8.



gure 7.8 Timeline of Purwokerto development from economist perspective

7.3.5. Constructing an event sequence diagram of Purwokerto growth from an economist perspective

Incorporating the sequence of events presented in the timeline diagram and causal loop diagram presented previously, an event sequence diagram of Purwokerto growth from an economist perspective, taken from Rossi-Hansberg and Wright (2007), is presented in Figure 7.9. Each empirical event is matched with the suitable sub-criteria and is linked following the logical thinking from an economic perspective.

7.3.6. Narrative of past transport and land use development for Purwokerto from an economist perspective

The Colonial era

The past relationship between transport and land use in Purwokerto was established by some related events. The events have occurred in this city's journey over time. Purwokerto was firstly an undeveloped area and a traditional agricultural area. Its people utilising crops to fulfil their own domestic needs. The economy of the city started to grow in 1983 when people were introduced to some new agricultural commodities. It was an implication of *cultuur stelsel* (cultivation system) that was created by the Dutch colonialism to recover their bad economy in their own country. Cultivating and exporting the valuable agricultural commodities was therefore expected to bring cash flow.

Following the new system, The Dutch constructed a new rail track connecting Purwokerto with major railways from the Northern to Southern parts of Java Island in 1893. A new train station was also built to facilitate rail transportation that was first addressed at transport agricultural commodities. The presence of transportation infrastructure drove changes in the economy. In fact, the cultivation system and presence of the new transportation system did not give significant improvement to per capita income since the cultivation system was basically designed for the colonialist's interest. People in Purwokerto were in poverty and had a low level per capita income (Basundoro, 2009). However, a considerable impact was given to the economy of Purwokerto as it started to shift from subsistence to money economy which refers to the exchange for the goods (Kadir, 2006; Yuliati, 2010).

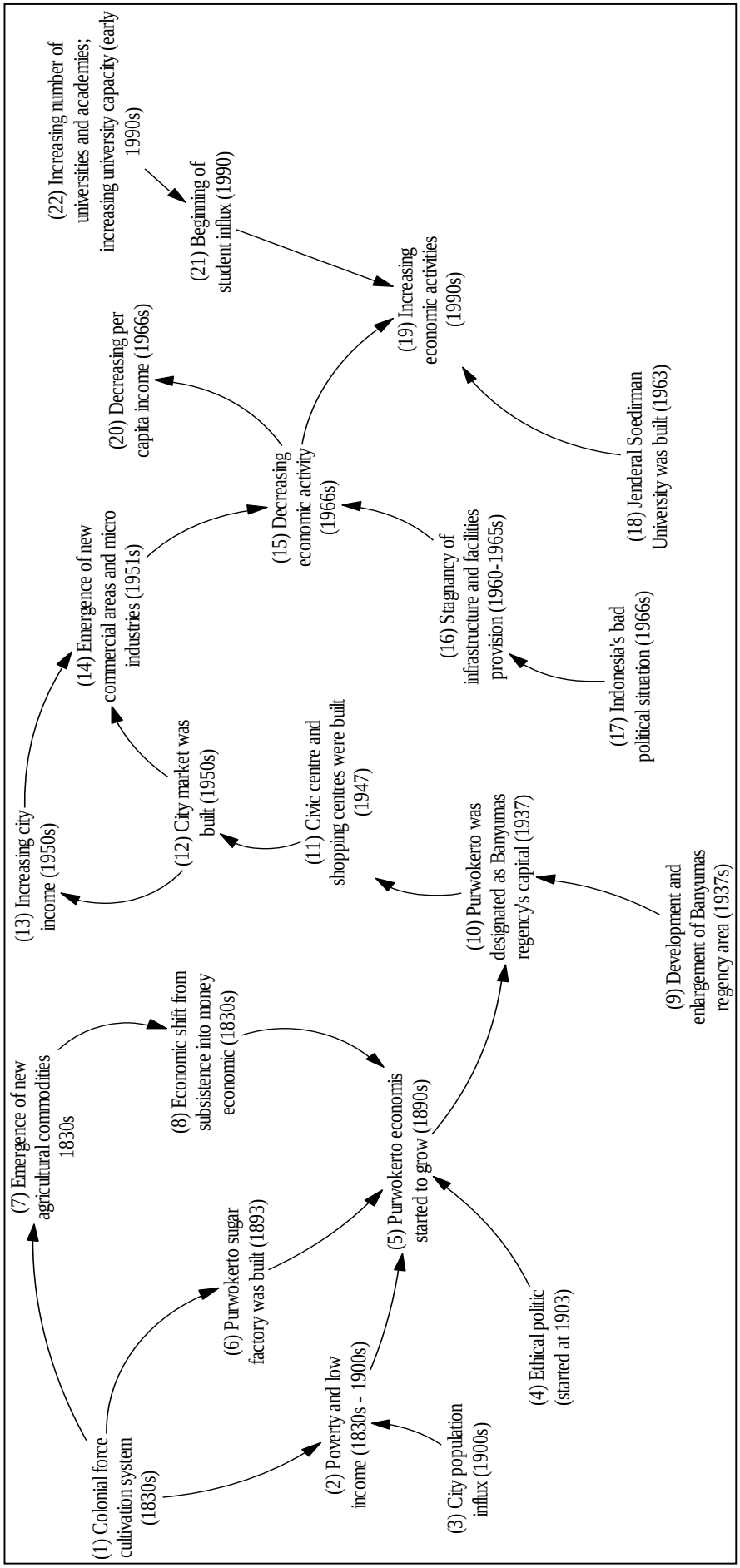


Figure 7.9 Event Sequence Diagram for Purwokerto Growth

As happened in most Javanese cities, Purwokerto also got a population influx in the 1900s. Unfortunately, the increasing population was not positively correlated with the economy (Basundoro, 2009). Hence, the great population brought an increasing rate of poverty since the income decreased. The bad economy condition started to improve when The Dutch addressed the *Ethische Politiek* (ethical politic). It attempted to improve the economic condition of Indonesia. The Dutch government created some economic activities and facilities in some Indonesian cities.

Purwokerto had already had transport infrastructure ready which later strongly supported the growth of the city. Moreover, Purwokerto was assigned as the new capital regency for Banyumas in 1937. As the capital regency, numerous facilities were built to support its function. Therefore, Purwokerto attracted more interest from people where they could develop their business from the advantages on offer.

The Old Era

Economic facilities e.g. the city market was built in the 1950s to promote economic activities and money flow within the Purwokerto area. Moreover, it also attracted investment flow to Purwokerto. In turn, this played a significant role into increasing the city income in the 1950s. The increasing economic infrastructure and facilities constructions were kept until 1965 when there was national political chaos. Indonesia, in general, got stagnant in the infrastructure and facility constructions, including those in Purwokerto. The stagnancy development brought both decreasing economic activities and per capita income in Purwokerto around 1966.

After years, the improvement of education level and economic condition led to increasing economic activities in Purwokerto. Along with the widening covered area, Purwokerto has got increasing investment and money flow since then.

7.4. Geographer

7.4.1. Preparing an approach for a narrative from a geographer perspective

In accordance with the Purwokerto's conditions Table 7.3 shows some information about Purwokerto that finally leads to choose the sub-criteria used in defining the causal loop diagram's variables. This table also expresses how the appearance of activities have a close relationship with spatial development and movement.

Table 7.3 Case study city's characteristic and the chosen sub-criteria from geographer perspective

No	General information of Purwokerto	Criteria	Sub-criteria
1	Purwokerto is concerned as the centre of activities of the southwest parts of Central Java province. Its activities influence the growth of its coverage area.	Spatial perspective	Regional perspective (A3)
2	Transport activities direct spatial development. The emergence of new activities follows the existence of transport.	The role of transport	Transports drive growth of the city (B1)
3	City planning in Purwokerto guides the development direction. The spread of activities and settlement stated in the Purwokerto Spatial Planning generates and pushes the growth in the intended areas.	The role of city planning	City planning drives the city growth (C1)
4	Government policies regarding leading activities and poverty alleviation have driven spatial development i.e. the spatial growth direction, the increased quality of the living environment.	Other causes of growth	Institution and government policies (D1)
5	Institution and government policies with respect to economic play a significant role in boosting the economy after its initial growth.	Type of country	Developing countries (E2)
6	Purwokerto is a monocentric city with a major centre. The major centre is fulfilled by economic activities and civic centre. The monocentric centre attracts to the centre and makes it densely grows.	City/regional type	Monocentric city (F1)
7	Increased population has pushed the widening of the area of coverage as well as generated and spread economic activities. The widening coverage area gradually creates wider urbanised area.	City Definition	Population (G1); Economic (G3); Geographical boundary (G4)
8	Increased transport infrastructure provision provides easy movement and generates new settlement away from the initial city centre.	Transport provision	Transport infrastructure provision (H2)
9	A number of the facilities in Purwokerto and its coverage area have grown along with the role of Purwokerto in the region.	City characteristic	Facilities provision (I2)

In accordance with the case study city conditions, an approach (a set of sub-criteria representing a particular perspective) from Zhang et al.'s (2013) paper, is then constructed. This set of sub-criteria apparently has some relevant sub-criteria regarding Purwokerto's conditions. The approach is set from some sub-criteria: regional perspective (A3); transports drives growth of the city (B1); city planning drives the city growth (C1); institution and government policies (D1); developing countries (E2); population (G1), economic (G3), geographical boundary (G4); transport infrastructure provision (H2); and geographical location (I1) chose in Table 7.3.

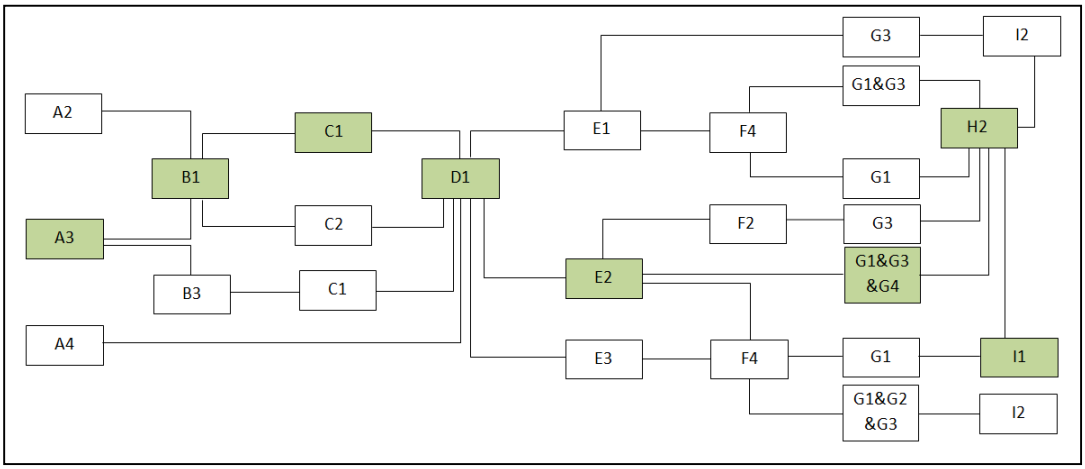


Figure 7.10 A Set of approaches from geographer perspective

7.4.2. Creating a causal loop diagram from a geographer perspective

Using the perspectives of a geographer, this section presents the diagram of the causal relationships among the variables in the growth of the city. It shows how the variables correlate with one another in the city growth process from the geographer's point of view. Geography broadly attempts to understand the relationship between human activities and their effects on the environment referring to the spatial result.

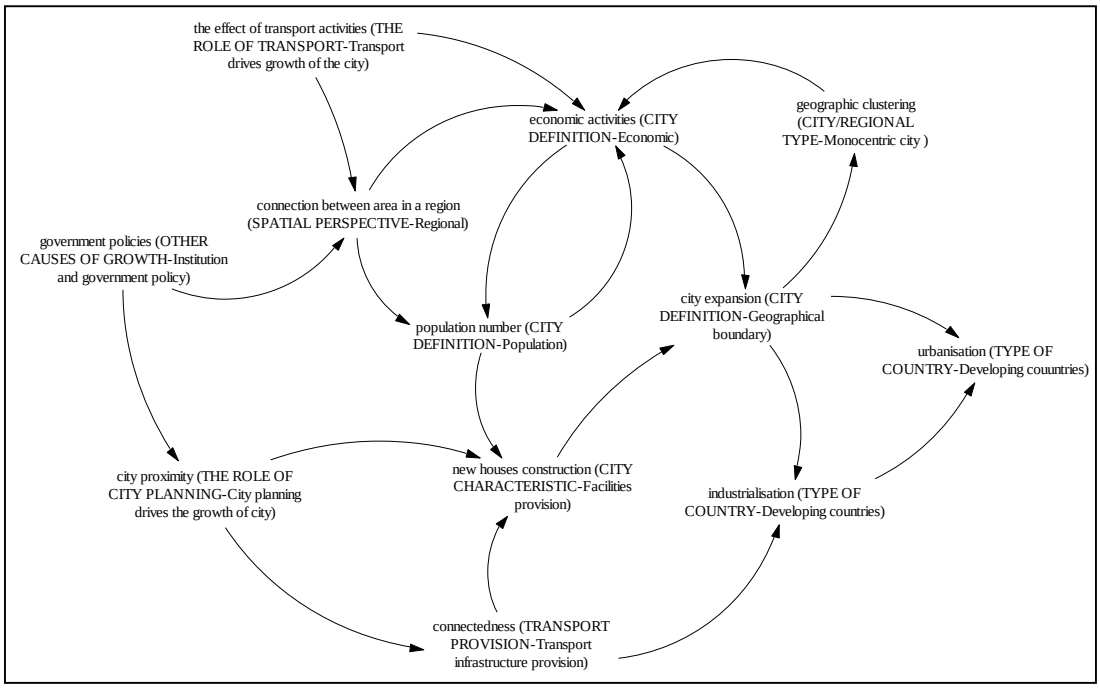


Figure 7.11 Causal loop diagram in geographer perspective

7.4.3. Past data/evidence of Purwokerto from a geographer perspective

Studies conducted by geographers are commonly concerned with the effect of human activities on the environment. The discussions are mainly related to spatial considerations.

Regarding Purwokerto as the primary case study city, some evidence is recorded in relation to the expansion of its geographical boundaries. Hence, the development of Purwokerto over time is evidently affected by its position as the growth centre in the region.

The occurrence and growth of activities apparently influence the urbanisation in Purwokerto. Urbanisation is indicated by the growth of some sub-urban areas. The emergence of new sub-urban areas and the integration of those areas into an extended city area shows how the core city activities trigger city expansion.

Moreover, Purwokerto's activities also attract people to migrate to this city. The increasing population generates the need for infrastructure provision. Some events regarding the recorded evidence are presented in the timeline in the next subsection.

7.4.4. Compiling a timeline diagram of Purwokerto growth from a geographer perspective

Purwokerto has continually been developing since its initial establishment. Its city boundaries have changed along with the urban function criteria stated in Indonesia's spatial regulations (Ministry of Justice and Human Rights of the Republic of Indonesia, 2008). Its development has been influenced by many events related to many scales. Figure 7.12 depicts some sequences of the recorded events in the development of Purwokerto.

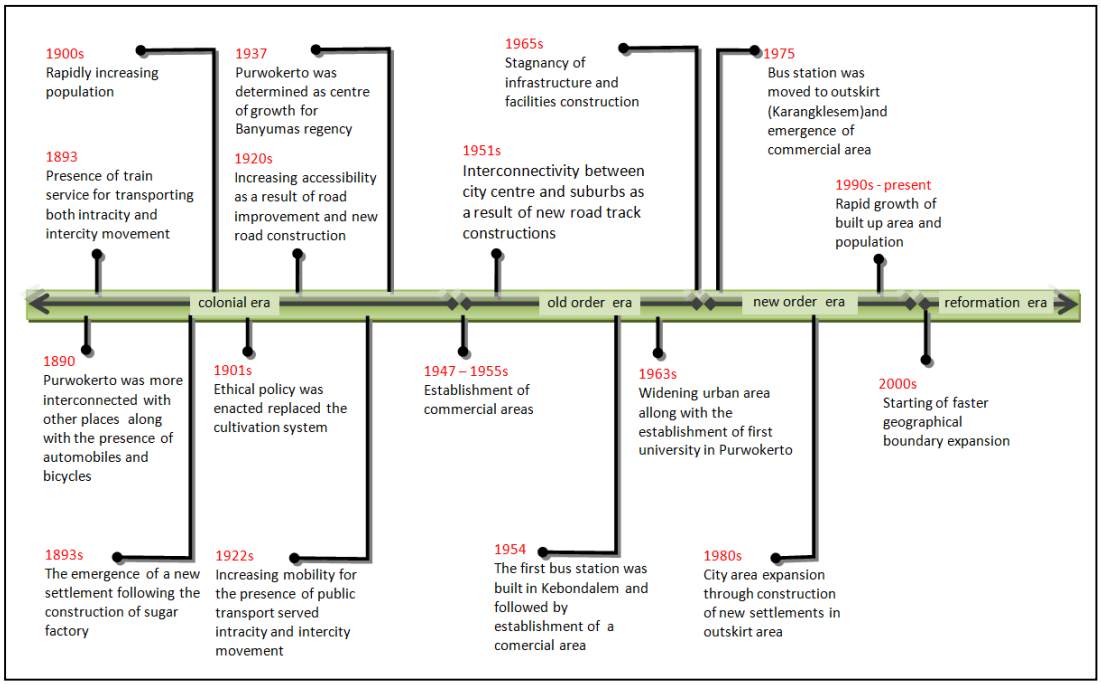


Figure 7.12 Timeline Purwokerto from geographer perspective

7.4.5. Constructing a past event sequence diagram of Purwokerto growth from a geographer perspective

The timeline diagram presented previously illustrates the development of Purwokerto from the geographer's perspectives. It depicts the growth of the area resulting from the increased population, transport development, and political factors. This diagram also shows how some activities occurred in particular areas. Following the logical thinking of Zhang et al. (2013) in linking between variables, Purwokerto's past event sequence diagram is presented in Figure 7.13.

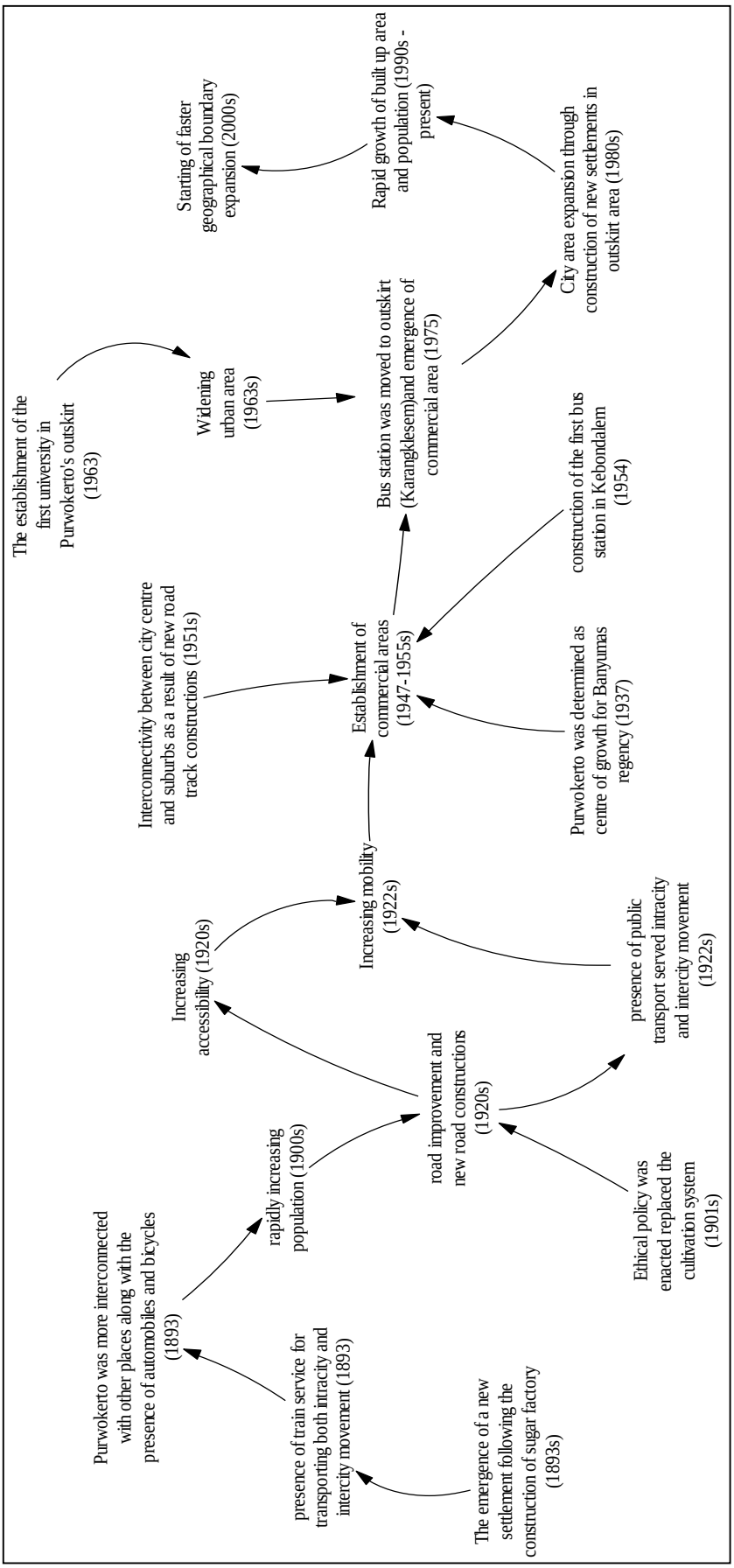


Figure 7.13 Event Sequence Diagram for Purwokerto from A Geographer Perspective

7.4.6. Narrative of past transport and land use development diagram for Purwokerto from a geographer perspective

Colonial Era

The colonial government policy in the cultivation system led to the construction of a sugar factory in Purwokerto in 1893 to accommodate sugar cane plantation in the surrounding areas of Purwokerto. The needs of accommodation for factory workers initiated the construction of new settlement by the factory, especially for foreign people.

Furthermore, the emergence of this facility stimulated some transport infrastructure constructions from simple soil pavements to railway services connecting numerous places in 1893s. New road tracks and road condition improvement were initially constructed to transport the sugar cane from fields to the factory. The presence of train service was also firstly provided to transport sugar factory product and other plantation products. These transport infrastructures then generated more people to move from one place to another within the infrastructure service areas since the transport infrastructure served as both intra-city and intercity transport. The movements amongst places, e.g. the sugar factory to the sugar cane fields, Purwokerto to Purbalingga, Kroya, Sokaraja, and Wonosobo, increased along with the occurrence of automobiles and bicycles as a response to better road infrastructure.

As widely happened in most Indonesian cities, Purwokerto also got a population influx in the 1900s. Rapidly increasing population especially occurred in the city area that then led to the increasing needs of facilities and infrastructure provision. The growth population in cities was caused by both natural growth and city migration. As Purwokerto just started to grow the growth of population was not as large as in big cities and this brought some issues in the city development such as transport and settlement provision.

The colonial government improved the existing roads and constructed new road tracks to address the population issue in the 1920s. This development moreover was supported by the changing political will in 1901s from the colonial government through the implementation of Ethical Policy to replace the Cultivation System. The transport provision spread population as it connected places. Accordingly, the transport provided better accessibility to Purwokerto and its surroundings, e.g.

Purbalingga, Sokaraja, and Ajibarang. Puwokerto then gradually grew as the centre of activities that provided job opportunities and economic activities around the train station and sugar factory. Since the accessibility got better, the capability of transporting people and goods from Purwokerto to its hinterland increased. The presence of road public transport in 1922s that firstly served a route connecting Purwokerto – Purbalingga – Wonosobo escalated the mobility level.

As Purwokerto grew more as a result of better accessibility and also increased population, the former activity centre around the sugar factory spread its growth effect to new places. Moreover, in 1937 Purwokerto was stated as the new regency capital of Banyumas replacing Banyumas sub-district position.

Old order era

The growth of Purwokerto, therefore, became greater and was indicated by the emergence of new activity centres in some places in 1947 – 1955s, i.e. city square, Kebondalem in the northern area, and Bobosan. Regarding Kebondalem activity centre, it was initiated by the emergence of a bus station built-in 1954. The bus station was surrounded by commercial activities which made the area gradually became bigger and larger.

Meanwhile, those economic activity centres grew and were followed by the expanding of the settlement area around its primary area. Accordingly, the activity centre grew as a mixed-use area that would later become greater along with the increasing population and job opportunities.

Following the expansion of activity centres, the Old Order Era government constructed some new road tracks connecting economic centres in 1951s. Therefore, Purwokerto started to expand its geographical boundary since the primary city centre interconnected with the outskirts.

In relation to education, Purwokerto was seen as a potential area where a university could be founded. Therefore, in 1963, Jenderal Soedirman University (well-known as Unsoed) was built as the first university in the Southwestern part of Central Java Province to cover the students within this area and also the Southeastern West Java Province. Unsoed was built in the northern outskirt of Purwokerto. From that time, this area grew as an education area with its education service facilities. This area, in turn, interconnected with other cities making the Purwokerto area wider in 1963.

New Order era

Along with the area development of the activity centres, a neighbouring area of Purwokerto called Kebondalem that had a bus station within its area turned into a very crowded and dense area. Consequently, the government decided to move the first bus station to a new place in Karangklesem, in the Southern part of Purwokerto in 1975. This place obviously grew fast as it was surrounded by economic activities and settlement areas.

In the 1980s, Purwokerto developed some settlement areas in the outskirts: southwest, southern, and northern area. These new settlement areas were built to accommodate the need for housing that increased in line with the population growth. The construction of the settlement areas was followed by providing facilities to serve the inhabitants. Accordingly, those settlement areas grew and became new city centres that were connected to other centres. As a whole, these were steadily marked as a key point in the widening of the Purwokerto city area.

Reformation era

The rapidly increasing growths of population and activities, including education, are believed as the causing factor in the growth of built-up areas in Purwokerto. In this regard, the northern part of Purwokerto functions as an education point and other places as settlement areas grew rapidly starting from the 1900s to present. Purwoketo became a contiguous area that has then been linked by numerous transport modes.

The growth, however, has occupied more land to be changed as built-up areas. These circumstances generated a negative impact on the environment in turn, in the northern part of Purwokerto which was intended to function as the catchment and green area. Currently, this became an issue in developing city planning document in regard to sustainable development. Land use planning was placed to regulate uncontrolled land acquisition.

7.5. Sociologist

7.5.1. Preparing an approach for a narrative from a sociologist perspective

Purwokerto grows in its way and is characterised by numerous events which appear

over time. In some directions, the growth of the city influences how people interact with one another as well as how people develop their communities. Table 7.4 presents some information regarding the Purwokerto's conditions from the sociologists' perspective following Tirtosudarmo's (2010) paper to define the selection of sub-criteria to be used in the next steps.

Table 7.4 Case study city's characteristic and the chosen sub-criteria from sociologists' perspective

No	General information for Purwokerto	Criteria	Sub-criteria
1	Purwokerto is set as a centre of government, economic, education, and public services for the Southwestern part of Central Java region. Therefore, Purwokerto attracts people to come for related reasons.	Spatial perspective	Regional perspective (A3)
2	Purwokerto is a transportation hub in the Southwestern part of Central Java Province region. Two different modes have made Purwokerto as a transit node as train and road transport. Historically, Purwokerto started to grow faster when the transport infrastructure was constructed.	The role of transport	Transport drives growth of the city (B1)
3	City planning is important in the development of Purwokerto overtime. Land use guidance and city development direction drive the growth of Purwokerto city since the Dutch era. Urban development and city expansion have also been directed by city planning. The city development and expansion generated more intensive relationships between people.	The role of city planning	City planning drives the city growth (C1)
4	• Some government policies (e.g. entrepreneur policy), have driven the growth of Purwokerto • Increasing population brought labour availabilities as well as the presence of some universities deliver more educated people for Purwokerto.	Other causes of growth	• Institution and government policies (D1) • Human capital (D2)
5	Rapid urbanisation as one of the developing countries characteristics has been shown by the growth process of Purwokerto.	Type of country	Developing countries (E2)
6	• Expanding the city area was affected by the increase in population in Purwokerto city. The population become denser in the city centre area and the dense area also gradually spread into other Purwokerto areas. • There were transforming economic	City Definition	Population (G1); Life quality (G2)

No	General information for Purwokerto	Criteria	Sub-criteria
	activities in Purwokerto since it became the capital of Banyumas Regency. Primary economic activities had shifted into tertiary ones. The changing main activities affected the socio-economy of Purwokerto inhabitants' livelihood.		
7	Construction of transport infrastructures connected some different places and boosted relationships between people. Road constructions linked between activity centres and from the former city centre with new sub-centres.	Transport provision	Transport infrastructure provision (H2)
8	Purwokerto is located on the main track connects different places in Java island. The transit inland position gives some benefits for Purwokerto, e.g. as a transport hub	City characteristic	Geographical position (I1)

Following the chosen sub-criteria in Table 7.4 an approach can possibly be set combining A3 (regional perspective), B1 (transport drives growth of the city), C1 (urban planning play a role in city growth), D1 (institution and government policies) and D2 (human capital), E2 (developing country), G1 (Population) and G2 (life quality), H2 (transport infrastructure provision), and I1 (geographic position). Using the sociologists' perspective diagram in Chapter Five, an approach is depicted as a coloured box combination presented in Figure 7.14.

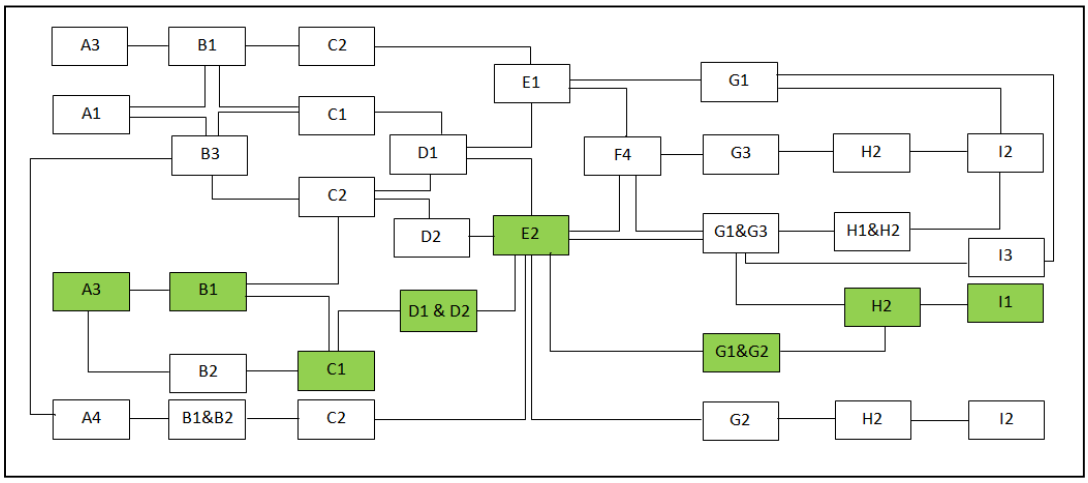


Figure 7.14 A set of approaches from the sociologist perspective

7.5.2. Creating a causal loop diagram from a sociologist perspective

The causal relationship diagram depicted in Figure 7.15 is one of many different available perspectives from the sociologist perspectives. There are some variables concerning this city growth process, e.g. rural-urban disparities, government policy, social transformation, economic welfare, city population, city in-migration, and

demands on infrastructures. In this regard, modernities represented by the development in technology, and big city's economic become exogenous factors that influence city growth processes from outside of the system. It basically refers to how development influences social transformation as well as the effect of social transformation in changing peoples' behaviours and ways of thinking.

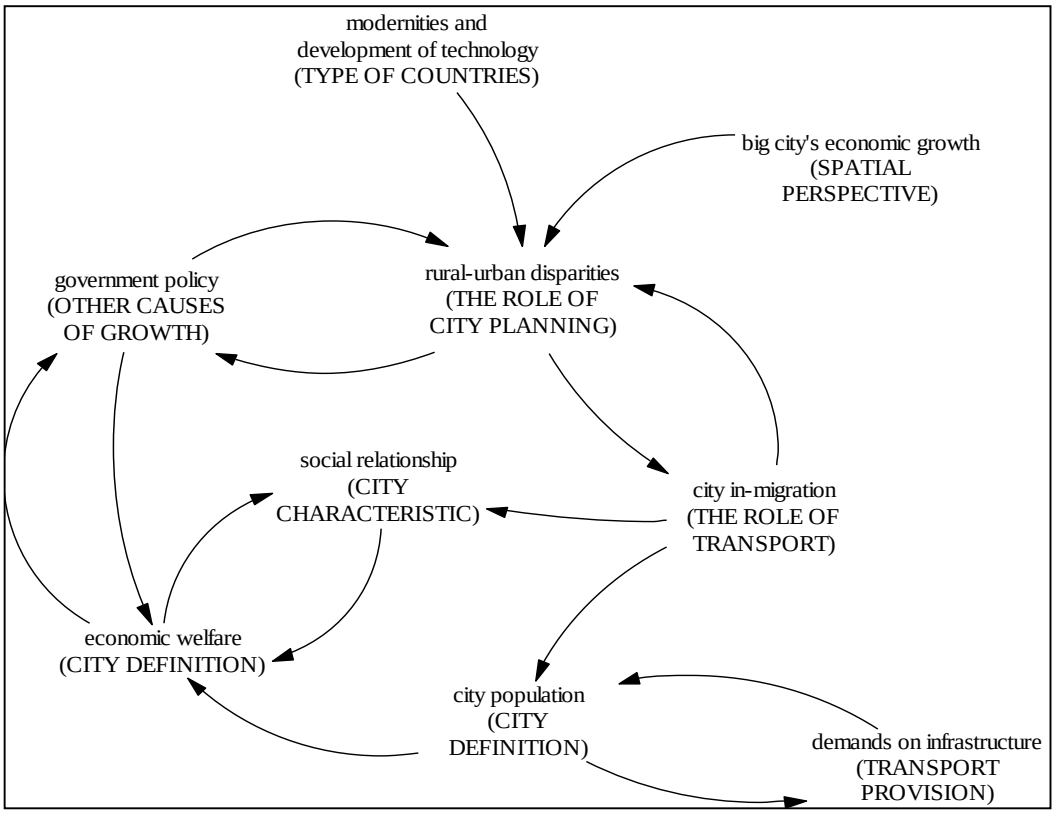


Figure 7.15 Causal relationship diagram from a sociologist perspective

7.5.3. Past data/evidence of Purwokerto from a sociologist perspective

For years in its development, Purwokerto has been experiencing numerous remarkable events. Some events were recorded as they gave significant effects on the growth of Purwokerto. The events also played a significant role in social changes; social system and relationship. Basundoro (2009) and Anwaruddin (2009) mention some occurrences that influence the growth of the city as presented below:

- ***New technology and new innovations***

  The occurrence of new technologies and new innovations commonly bring changes in many of Purwokerto's life elements. It started with the cultural force

in 1830 in the Dutch era that brought new agricultural commodities with its cultivation method and processing technique. As it was forced cultivation, people were unconsciously driven to work hard (Basundoro, 2009). Hence once new technology and new innovation came, there were some responses from the community that later influenced the social system.

- ***New infrastructure construction***

  New infrastructure constructions, e.g. transport infrastructure and public facilities, boosted the connectivity between people. It brought the relationships that supported information transfer amongst people. The people and communities became more connected to one another.

- ***The emergence of new activities***

  The emergence of new activities was commonly related to the development of communities and growth of the population. An increasing population mean an increasing number of demands.

- ***The new government policy***

  Government policies played a role in driving the city growth direction. The policies were generally formed supporting the vision of the city.

  In city development there were some roles of the government policies, e.g. coping with problems occurring, anticipating possible developments in a particular aspect, shaping the environment in which the development of the city could be made. Hence, once a government policy was issued there would be a public reaction addressing the new guideline.

7.5.4. Compiling a timeline diagram of Purwokerto growth from a sociologist perspective

Following the different eras in Indonesia, Figure 7.16 shows some events that gave significant effects on the growth of Purwokerto.

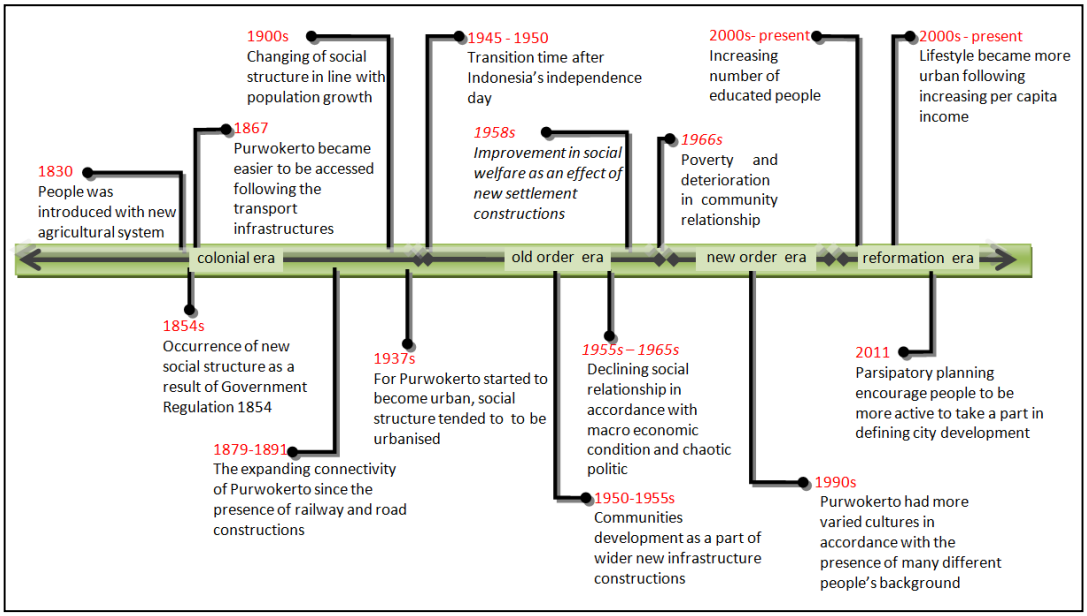


Figure 7.16 Purwokerto's timeline from a sociologist perspective

7.5.5. Constructing an event sequence diagram of Purwokerto growth from a sociologist perspective

Referring to some recorded events in Purwokerto's growth over time and following the causal relationship diagram from a sociologist perspective represented in Tirtosudarmo's (2010) paper, an event sequence diagram is built as seen in **Figure 7.17**.

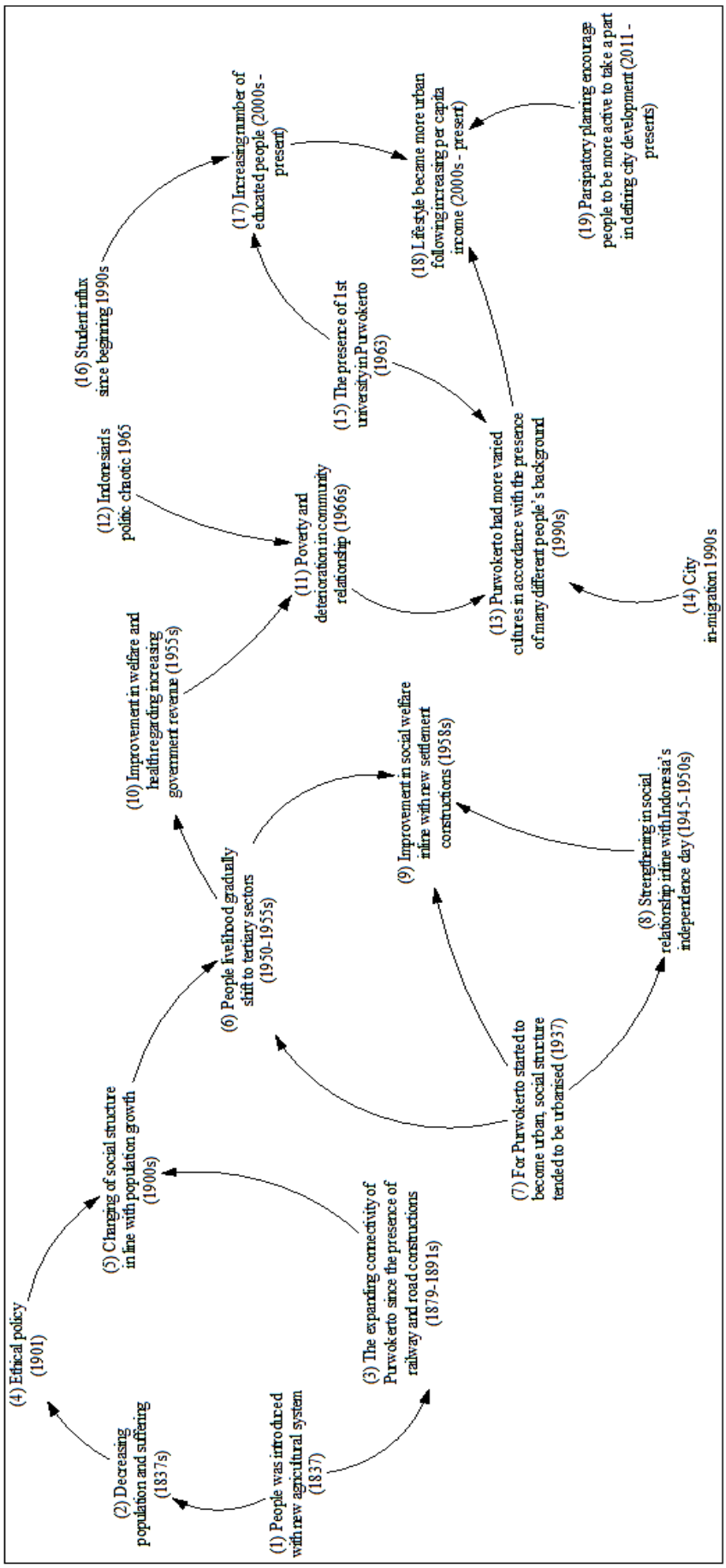


Figure 7.17 Past sequence event diagram for Purwokerto from a sociologist perspective

7.5.6. Narrative of past transport and land use relationship for Purwokerto from a sociologist perspective

The Colonial Era

Agricultural was the majority livelihood for Purwokerto's inhabitants. The simple techniques of plantation were used as they only fulfilled the subsistence of everyday needs. Following the major livelihood, the social structure of Purwokerto was broadly differentiated into the upper class and lower social class. Most native Indonesians are generally grouped in the latter. Only a few of them who come from court can be taken into account into upper class group.

In 1837 the Dutch issued Culture System Policy[1] that forced Indonesians to cultivate some particular plants. This system then brought about new cultivation systems and methods that had influenced the emergence of a new social condition in Purwokerto and other places in Indonesia. On the one hand, this system made people suffer and in turn reduced the population, especially in Java Island. Regarding the social relationship, there was a degradation in the relationship between communities as people only bound in their own sociality and community (Wibowo, 2014). Therefore, social development was stagnant leading to a deterioration of Purwokerto's area.

On the other hand, the new culture system also brought people to new information in new cultivations and plantations. Another positive side of the new culture system was in the infrastructure system. As forced cultivation policy produced varied crops, the colonialist government needed infrastructures to carry the agricultural products from the culture system location in many places, including Purwokerto, to the exporting ports. Therefore, the Dutch then constructed some new transport infrastructures. Railway tracks were built connecting Cirebon – Purwokerto – Kroya in 1867. A station was also built in Purwokerto and became an important transport link hub of some different places in Java. The Dutch also built road systems both serving intra-city mobility in Purwokerto and intercity by connecting Purwokerto with many places in Java. These transport infrastructure provisions basically meant to accommodate

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[1] It is known as Cultuur Stelsel in Dutch. It was a colonialist's forced plantation in Governor General Van den Bosch era. This forced system was implemented to fulfil the deficit of Dutch finance and replaced the previous land rent-policy. Indonesians forced to plant some economically crops to be exported (Basundoro, 2009).

relation between many communities and played a role in transferring information amongst places.

A government regulation was then issued in 1854 regarding the colonial interest. Government Regulation in 1854[2] had, in turn, created a new class in a social community named '*priyayi*'. This class was set as a social upper class that broadly included well-born Javanese holding high government office (Sutherland, 1975). The government system adopted both the western and local Indonesian government systems. In this regard, *Priyayis* had a role in connecting elites and indigenous people and also spatially mediated between centres and regions. This social upper class played an important role in triggering the growth in their regions regarding their easy access and capability to information (Sutherland, 1975; Yuliati, 2010).

As a result of the government regulation in 1854, there was racial segregation that affected regional development processes. Three different racial groups were created by colonial government which evoked three distinct opportunities in having roles in human development. It was because the different social groups had different legal systems (Lindsey, 2008) therefore the lowest social group (natives) had no accessibility even to develop themselves.

Regarding The Culture System, unfortunately, this system had given an unpleasant outcome to the Indonesians. Hence, it was then encouraged that the parliament of the Netherlands had to issue a new policy for the Netherland East Indies named Ethical policy[3] in 1901. In this era, some opportunities were given to Indonesians to improve their quality of life, i.e. education, health, and welfare. These opportunities, unfortunately, were only given to upper social groups i.e. *priyayi*. However it had

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[2] It is known as Regering Reglement in Dutch. Regering reglement 1854 was issued in order to help the colonialist government to manage a vast colony area-East Indies (it covered almost entire area of current Indonesian territory). There were two important acts accommodating establishment of administrative area and juridical division for Netherland East Indies *people*. This government regulation is a colonialist regulation in centralising and deconcentration. East Indies was hierarchically divided into some administrative regions, i.e. (1) gewest (residentie), (2) afdeling, (3) district, and (4) onderdistric (Sutherland, 1975; Yulianti, 2010). With regard to people, this government regulation 1854 distinct three racial groups: Europeans, foreign oriental, and natives (Lindsey, 2008)

[3] The ethical policy was basically set to transform Indonesian society to be much more modest. However, it did not completely work since the colonialist policy kept the racism and aggressively exploited Indonesia's resources (Lindsey, 2008).

forced the occurrence of an educated and modern group of people such as middle-class professionals who in turn played a significant role in community development in Indonesia as it happened in Purwokerto. Further, the improvement of well-being then affected the increasing population growth.

The awakening of middle-class professionals enlightened indigenous people with their expertise in technology and socio-cultural (Cote, 2014). It then educated people to develop themselves regarding some colonial policies. In Purwokerto, with their wide relationships and abilities the educated people persuaded the community to enhance their capability. The community growth was also supported by the presence of transport infrastructures, both from railways and roads that connected Purwokerto to other places. The links made by these transport connections drove people to have ease in sharing and having relationships amongst communities.

Purwokerto found a starting point in its growth as a city in 1937 when this place was stipulated as the capital of Banyumas Regency. This new capital regency slowly started to become urbanised for its more organised city structure. Allocation of some activities, e.g. commercial, settlement, government, had promoted urbanised area growth. Years later, as the city developed, people's livelihood gradually started to shift from primary to tertiary activities.

The Old Era

Passing through transition time of its independence day in 1945, Indonesia started the early years of development in the 1950s. Purwokerto, as one of some important cities in Java, got a significant effect on its growth. New infrastructures and building constructions; e.g. city markets, new road tracks, shopping centres, societies centres, were built. Welfare and life quality gradually increased that influenced people participation in spatial development as they began to have a chance to take part in city development. On the other hand, the provision in infrastructures and facilities attracted people to come. Moreover, it was supported by its strategic position in transportation that Purwokerto became easier to access.

During 1955s – 1966s Indonesia had faced a bad condition both in term of economy and politics. Macro economies declined and there was political condition chaos in 1965 (Lindsey, 2008). As this condition affected the national development program, Purwokerto then had to deal with stagnation in growth. Conflicts between communities as a result of politic also led to social fragmentation.

However, there were some facilities which were built e.g. new settlements and new road tracks in the 1950s. These constructions meant a social process for Purwokerto since the development brought increasing welfare in later years. Purwokerto authorities concentrated the activities in some places. An aim of activities concentration was to preserve the social relationship pattern.

The New Era

A former university in Purwokerto was also established in this period (1955–1965). The University of Jenderal Soedirman was erected in 1963. It has become another magnet that led different cultures to come into Purwokerto ever since. The presence of the students increased over time as there were other universities built following the first one. Student influx started to occur in 1990s when the number of universities and their capacity increased. Furthermore, it brought a positive effect on the improvement in the education sector that had driven increasing educated people to Purwokerto (Mutahir and ,Makhasin, Luthfi, 2010).

The urban activities that were previously mentioned were started in 1937 which continued to grow along with the growth of population. Some issues, however, have risen as a result of increasing population. Rising labour force, poverty alleviation, improvement in health and education, poverty and freedom of choice had occurred along with the development of Purwokerto. Many government policies were issued to tackle development obstacles. Following the Indonesian national policy in decentralisation that was represented by local government law, Purwokerto encouraged people's participation in defining their city development. It was completed by accommodating people participation with community-driven development programmes.

The Reformation Era

Nowadays, Purwokerto has developed as a growing city with open-minded people who live within it. People's livelihoods have been dominated by the tertiary sector that is represented by the service activities.

Chapter 8
Relevant Government Future Planning Documents for the Case Study City

8.1. Introduction

Mentioned in Chapter Three (the research methodology section), the future city narratives are constructed following a similar manner as it was conducted in past development. However, the future is distinguished from the past in term of data evidence. In this regard a study of the future of the city will need to discuss the spatial and social development, economic performance and social factors. Mentioned previously in Chapter One, there is a complex discussion in predicting the future of the city.

This present study then uses legal-written planning documents to be treated as future data evidence. The use of these future documents is based on the fact that the documents cover the simplified versions of different assumptions regarding future predictions of the cities. Planning documents are used in an attempt to consider the past experiences from a particular city to carefully predict the future of the city and construct the plan for the city. The city planning documents then map the intended city future condition by taking into account the planning regulations that are yet to come.

Considering predict and provide approach mentioned in the previous chapter, the city plans are assumed as the way how the authority provides the demands resulted from the prediction process. It is because the government's development policies, that also reflect in city plan's content, addressed the issue of a better city condition. As they involve several city aspects, there are also a number of stakeholders to be taken into account. Therefore, the policies to be supported by all of the city's elements including people and politicians. In order to make planning policies to be implemented well, each city element needs to provide their sustenance. Moreover, regarding Indonesia's regional development regulation, the governance at the local levels will be able to perform well if there is cooperation and support between the stakeholders at all levels of government (State Secretary Ministry Government of Republic of Indonesia, 2014). In this respect, there is a stage for hearing a specific regulation before it is

implemented to get new perspectives, visions, and knowledge in order to find better ways to develop strategic city management. Further, citizens, too, need to be engaged in the development and be encouraged to take responsibility for the implementation of the policies

On the other side, it is a fact that city practitioners, including city authorities, planners, and other stakeholders, have a massive number of experiences in the city development process. This can support the understanding of how a particular city's condition will be in the future.

This chapter presents some future documents related to the intended development of Purwokerto city. These include development programmes in all levels i.e. national, regional, and local both in long term and short term period, as well as national, regional and local planning. Furthermore, these regulations and development programmes cover the national economic growth, growth centre decentralisation, stimulating human development and socio-cultural in urban development, settlement provision, promoting the establishment of a compact city by regarding efficient and fair land use, increasing human resources capacity, institutional, and applying of good governance principles. As there are three levels of city planning documents considered in this section, there will be a process to examine whether the development programs taken from regional and national level are appropriate or not. The taken development programs are those that concern to the case study city. However, in the event of a contradiction between any planning documents, this thesis uses the lowest level of planning documents in view of the fact that those documents consider the certainty of implementation.

8.2. Development plan related to the case study city on the national level

There are some national plans and programmes that relate to the case study city. Those regulations directly or indirectly influence the development of Purwokerto city.

8.2.1. The master plan for the acceleration and expansion of Indonesian economic development 2011-2025

The acceleration and expansion of Indonesia's economic development are to create a

self-sufficient, advanced and prosperous Indonesia. Regarding this planning document, Indonesia is expected to be a part of the developed countries in the world with per capita income of USD 14,250-USD 15,500 with a total GDP of USD 4.0-4.5 Trillion in 2025. This economic condition will be combined with 6.4 – 7.0 real economic growth and 3.0. inflation in the same year. Figure 8.1. below depicts Indonesia's GDP plan.

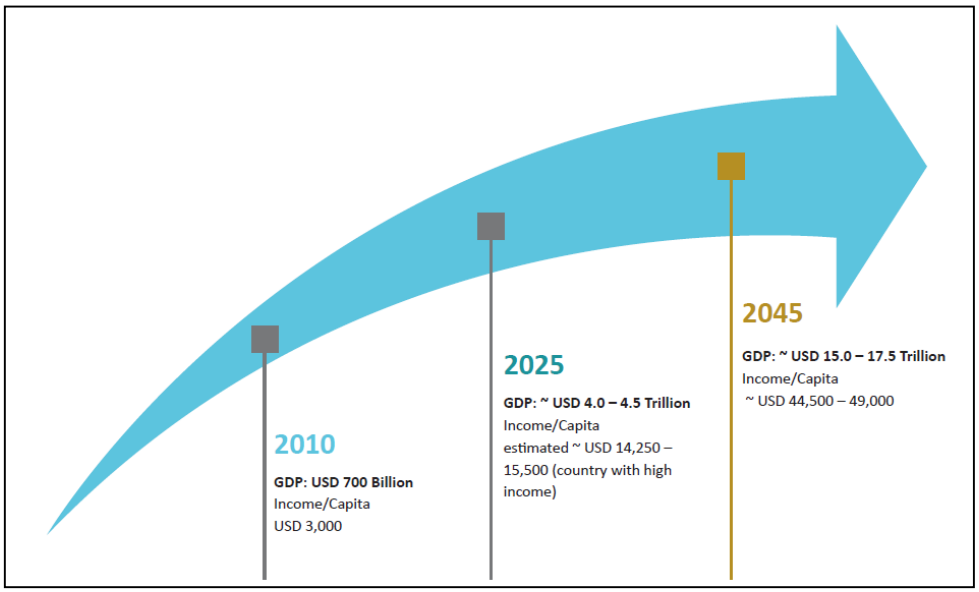

Figure 8.1 Plans for Indonesia's GDP

(Source: Masterplan for Acceleration and expansion of Indonesia's economic development; Ministry of National Development Planning/ National Development Planning Agency, 2011)

Regarding per capita income in 2010, Purwokerto was lower than the national per capita income. In 2010, borrowing the economic data in Banyumas statistic data (BPS, 2011), the per capita income was about $763 whilst national per capita income $3000. This condition shows a large gap between the national and local economic condition.

The economic vision has been planned to be achieved by focusing on three important goals (Ministry of National Development Planning/ National Development Planning Agency, 2011: p. 17), they are:

1. To increase the added value and expanded value chain for industrial production processes, the efficiency of the distribution network, and capability of the industry to access and utilise natural and human resources. These increases can be attained by the creation of economic activities within regions as well as among economic growth regional centres.

2. To encourage efficiency in production and improve marketing efforts to further integrated domestic markets in order to push competitiveness and strengthen the national economy.
3. To push the strengthening efforts of the national innovation system in production areas, process, and marketing with the main focus on overall strengthening of sustainable global competitiveness towards an innovation-driven economy.

In accordance with those three goals, the current Purwokerto's economic structure might be developed in some sectors that give high contributions to the GDP. The previous contribution of economic sectors to the GDP is presented in Figure 8.2. The essential role of transportation in connecting and transporting resources and production processes is actually possible to develop. Hence, the development of transport infrastructure and enhancement of its service will be possible to support the intended connections. Meanwhile, agriculture is also an important economic sector in Purwokerto's economic structure. With regard to strengthening the local potential, this sector can develop through the involvement of research and technology, e.g. agriculture infrastructure can be developed to increase the amount of production level.

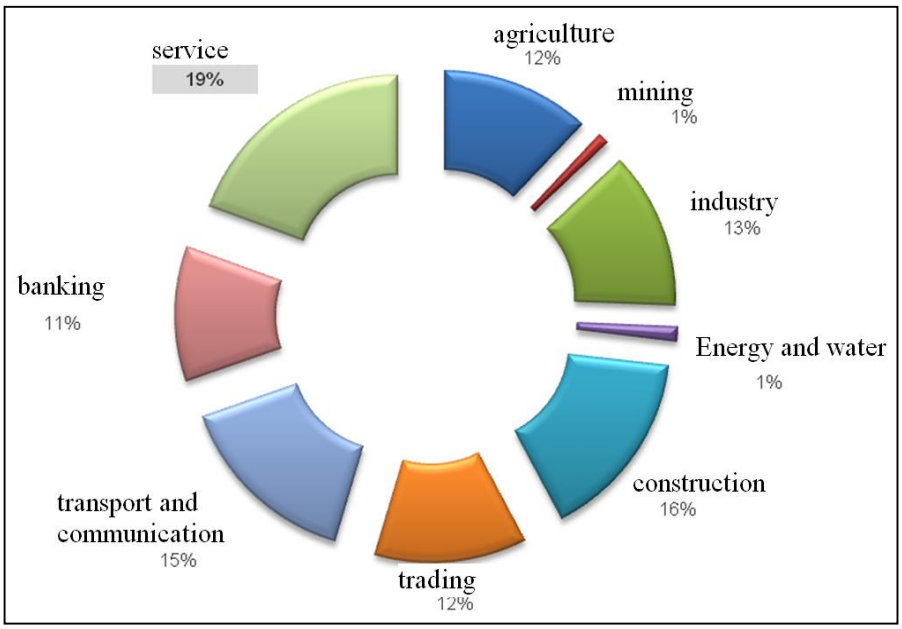

Figure 8.2 Economic Sector Contribution to Purwokerto's GDP 2010 (source: Purwokerto Spatial Plan 2014 – 2034; Sekretariat Daerah Kabupaten Banyumas, 2014)

In the Indonesian development plan, Purwokerto is a part of the Java economic-development corridor. Figure 8.3. depicts Purwokerto as a part of Java island development scheme that geographically located in Southern Central Java (labelled

number 6 in the figure). Currently, Java is an economic pillar for the country's economy for its position as a centre of national industry and services. This position will be strengthened by the expansion of main economic activities and supported by infrastructure connectivity. The acceleration and expansion of economic growth in Java are also expected to reduce the GDP disparity between regions in this main Indonesian island. However, the development of the main economic activities in Java will be limited due to environmental considerations.

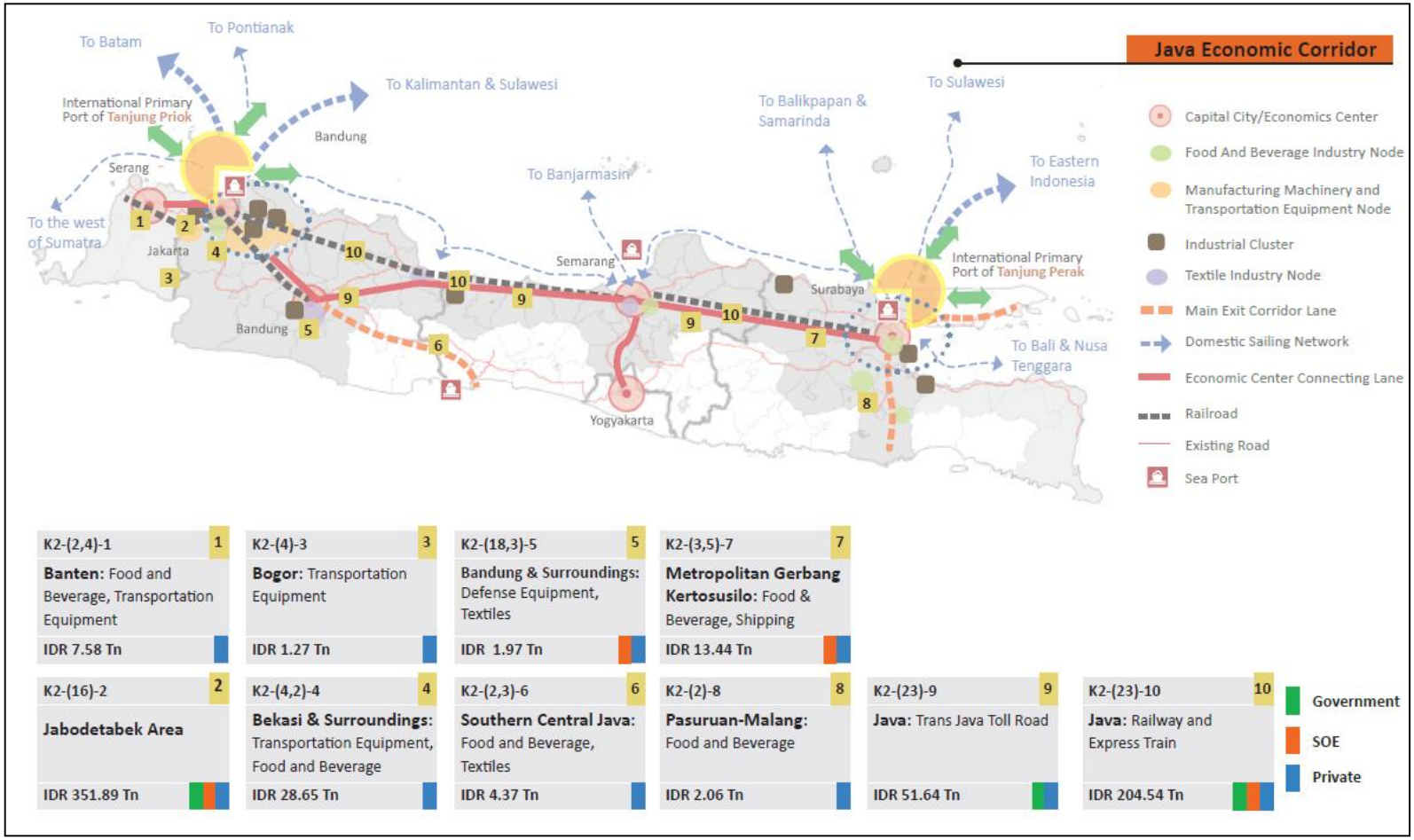

Figure 8.3 Java corridor investment development 2025 (Source: Masterplan for Acceleration and Expansion of Indonesia's Economic Development; Ministry of National Development Planning/ National Development Planning Agency, 2011)

The implementation of acceleration and expansion of Indonesia's economic development is planned through three phases: (1) quick-wins implementation, (2) economic and investment basis strengthen, and (3) sustainable growth implementation. The first phase (2011-2014) was focused on the implementation of initiative strategies that have already been completed in 2014 whilst the second phase (2015-2020) will focus on the acceleration of long term infrastructure development, enhancement of innovation to improve competitiveness, improvement of economic governance in various fields, and encouragement of industry which will create added value. The third phase will then focus on the enhancement of national industries to compete globally, as well as the implementation of high-level technologies to achieve sustainable development (Ministry of National Development Planning/ National Development Planning Agency, 2011: p. 180). Moreover, the three phases illustrated in Figure 8.3. has included the implementation strategy. This strategy will be done by integrating the three main elements; economic corridors[4], strengthened national connectivity (locally integrated, globally-connected), and strengthened human resources, national science, and technology to support the development of the major program in each economic corridor.

8.2.2. The medium-term national development plan 2015-2019

From this document, for the next 5 years, it can be seen that Purwokerto will be placed as the centre of priority activities for regional development. Some national development planning programs regarding Purwokerto are mentioned in this development planning program. Some national strategic planning activities program in these documents are:

- Construction of double track of Southern Java railway for Purwokerto – Kroya
- Redevelopment for railway track Wonosobo – Purwokerto

Following the economic projection for regional Central Java presented in this document, Purwokerto will be predicted to have 7.7% of its growth by 2019

[4]There will be six Indonesia economic corridors set: Sumatra economic corridor, Java economic corridor, Kalimantan economic corridor, Sulawesi economic corridor, Bali-Nusa Tenggara economic corridor, and Papua-Maluku Islands economic corridor.

(Kementerian Perencanaan Pembangunan Nasional, 2015). This target will be gained through some development planning programs especially with respect to the rural-urban linkage and infrastructure provision. Purwokerto, as a regional activity centre, will hold a key role in generating and keeping the two mentioned targets.

8.2.3. National transportation system document 2005-2025

The intended transport condition mentioned in the National Transport System 2005-2025 is an integrated modal and an efficient and effective modal performance. In order to get the expected transport conditions, there is a need to concern with the strategic environment changes, opportunities and constraints, issues of network aspects, safety, human resources and technology, environment and energy, and funding (Kementerian Perhubungan, 2005). Furthermore, the expected transport condition for all Indonesia cities in 2019 will be conditioned with the:

- Enhancement in public transport service to reduce the use of the private vehicle
- Increasing capacity in urban transport infrastructures, both for railway and road transports

Concerning the national transportation plan, it is very likely to be realised considering the transport potentials in Purwokerto city. Currently, Purwokerto is a transport hub for both road and railways (in the southwestern part of Central Java). Thus, an integrated modal between those different transport modals will be possible to construct.

8.3. Regional development planning documents concerning Purwokerto

Purwokerto is an urban area and its boundary does not refer to either regency or sub-district administrative boundary. The boundary of Purwokerto is as assigned in Banyumas Regency Regulation No 10/2011 about Banyumas Spatial Plan. This regulation mentions that Purwokerto is a part of Banyumas Regency that has an essential role for its urban characteristics in regional development. Therefore, in this section, the regions of Purwokerto includes to Central Java and Banyumas Regency.

8.3.1. Central Java spatial planning document 2009-2029

As mentioned previously, the Central Java spatial plan is a guide for spatial policies within the Central Java province administrative area. Essentially, this planning document regulates the utilisation of the productive area and the protected area in order to achieve the development purpose of Central Java Province development.

Regarding Purwokerto's position in the Central Java cities' system, Purwokerto is the centre of activities in the Southwest Central Java. This position will be highlighted in 20 years as explained in the Central Java spatial plan 2009-2029. Hence, Purwokerto will be positioned to develop regional spatial structure. Therefore, Purwokerto is currently set as the centre for economic, public service, and government for The Southwest Central Java Province. In this regard, there are some directions for many regional activity centres which are covered by Purwokerto. The Central Java spatial plan 2009-2029 is the main reference in compiling Central Java development planning programs both for long-term (20 years) and mid-term (5 years) as presented in Table 8.1.

Table 8.1 Development programs regarding Purwokerto

Development Programs	MtDP* II	MtDP* III	MtDP* IV
	2015-2019	2020-2024	2025-2029
Development of commuter train service Purwokerto-Slawi			
Development of commuter train service Purwokerto-Kutoarjo			
Development of cooperation between regencies within Central Java Province through a complementary relationship			
Development of regional activity centres' infrastructures			
Development road infrastructures West Java border – Purwokerto – Banyumas – Wonosobo – Secang			
Development of Purwokerto level A bus station			
Development of railway double track for intercity route Cirebon – Purwokerto – Kroya			

* MtDP stands for Mid-term Development Planning

(source: Central Java Spatial Plan 2009 – 2029; Sekretariat Daerah Propinsi Jawa Tengah, 2010)

8.3.2. Long-term Central Java development planning programs 2005-2025

The Long-term Central Java Development Planning Programs is a macro plan containing the vision, mission, direction, challenges, and priorities for long-term

developments. Its compilation process is done by involving all stakeholders of developments and complied from the Spatial Planning of Central Java province. The regional development plan is necessary to anticipate the effects of dynamic changes in regional development. Table **8.2** presents some remaining programs which are related to Purwokerto city taken from Long-term Central Java Development Planning Programs document.

Table 8.2 Development programs for Central Java development

Development Programs	MtDP* III 2015-2019	MtDP* IV 2020-2024
Improving human quality through education, religion, and technology		
Establishing of the regional economy based on regional potentials		
Strengthening equality and harmonious development between regions		
Improving transportation management by increasing integrated inter and intramodal to support efficient transportation		
Strengthening participation and empowerment		
Strengthening governance system		
Strengthening human quality improvement through education, religion, and technology		
Strengthening economic structure supported by main products that have strategic economic value, quality, and has comparative and competitive advantages in the global market		
Strengthening a safe and convenient transportation system to meet the needs of reliable mass transportation		

* MtDP stands for Mid-term Development Planning

(source: Long-term Central Java Development Planning Programs 2005 – 2024; Pemerintah Provinsi Jawa Tengah, 2008)

8.3.3. Banyumas regency spatial plan 2011 – 2031

As mentioned in Chapter Five even though Purwokerto itself is specified as a city area, it is administratively a part of Banyumas regency. Therefore, its development is briefly listed in Banyumas development plan. Table 8.3 shows the development plans concerning Purwokerto presented in Banyumas Spatial Plan 2011-2031.

Table 8.3 Development planning programs in Banyumas spatial plan 2011 – 2031

Development Programs	MtDP* 2 (2016-2020)	MtDP* 3 (2021-2026)	MtDP* 4 (2027-2031)
Development of university facilities within Purwokerto area			
Development of tourism area within Purwokerto			
Development of regional scale economic activities in Purwokerto area			
Development of level A Purwokerto bus stations			
Construction of new commuter trains with intercity routes of Purwokerto – Slawi			
Construction of new commuter trains with an intercity route of Purwokerto – Kutoarjo			

* MtDP stands for Mid-term Development Planning

(source: Pemerintah Kabupaten Banyumas, 2011)

8.3.4. Banyumas long-term development plan program 2004-2024

This section shows a collection of development programs from some planning documents related to Purwokerto city. These documents have a 20 year time horizon and been regarded as long-term planning. However, each long-term document is divided into four mid-term development plans that are set once every five years. Table 8.4 shows the development planning program for Purwokerto taken from Banyumas Long-term Development Planning Program document. This presents the development planning programs from Purwokerto Spatial Planning. This spatial planning document has a long-term time horizon (2014-2034) and is divided into five-year mid-term plans.

Table 8.4 Development planning programs in Banyumas long-term development program document 2004 – 2024

Development Programs	MtDP* 3				MtDP* 4
	2016	2017	2018	2019	(2020-2024)
Arrangement of population distribution					
Development for education facilities					
Poverty alleviation through the neighbourhood development program					
Development for local and regional commercial centres					
Establishment of compulsory 12-year basic education					
Continuing development of commercial regional and local centres					
Development of regional network distribution					

Development Programs	MtDP* 3				MtDP* 4 (2020-2024)
	2016	2017	2018	2019	
Development for transport infrastructure connecting public activity centres					

* MtDP stands for Mid-term Development Planning

(source: Sekretariat Daerah Kab. Banyumas, 2009)

8.3.5. Banyumas local level transportation plan 2005 – 2025

The transport planning of Purwokerto is presented in Banyumas Regency's transport planning as it is administratively as part of Banyumas Regency. The transport planning aims to integrate all sub-districts within Banyumas Regency area. In order to achieve this aim, it sets some development programs regarding infrastructure, facilities, institutions, and regulations. These development programs are compiled in accordance with the related law and regulation (both national and regional).

The transport system in Purwokerto aims to achieve three major transport conditions: (1) effectiveness, (2) efficiency, and (3) integration both in transport intermodal and intramodal. The first condition refers to the ease of accessibility, road capacity, transport safety, and road quality. The second condition is about affordability and transport utilisation. The last condition, integration, relates to the ease of changing transport modes.

The transport development in Purwokerto is conducted due to the increasing transport demand. Transport development is also carried on to generate and strengthen the growth of the economy. Therefore, the transport improvements in Purwokerto are concerned with strengthening the connection between Purwokerto and the other RACs (Regional Activities Centres). Furthermore, the transport system of Purwokerto is also intended to link this city to the LACs (Local Activities Centres).

Table 8.5 shows some program that summarises Banyumas local level transport planning. The referred document has the time horizon from 2005-2025.

Table 8.5 Transport development programs (source: Banyumas Local Level Transport Plan 2005 – 2025; Dinas Perhubungan Banyumas, 2006)

Development Programs	The remain years					
	2016	2017	2018	2019	2020	2021
Enhancement Southern railway track Cirebon-Prupuk-Purwokerto-Kroya-Solo						

Construction for intra-city public transport station						
Construction for railway track connecting Purwokerto-Wonosobo						
Development of Cilacap-Purwokerto-Tegal railway to support industry development						
Improvement and enhancement capacity for railway passenger service connecting Cirebon-Purwokerto-Kroya-Solo						

8.4. Purwokerto local development planning documents (Purwokerto spatial plan 2014-2034)

The Purwokerto local development direction is officially guided by Purwokerto's spatial planning that complies to the higher-level planning documents: national planning documents and regional planning documents. This spatial planning has been compiled for a certain time horizon regarding substance complexity. In its implementation, spatial planning has met the changes in geographical city boundary. Purwokerto's city area becomes larger over time as the urban effect spreads into wider areas. This section will explore future planning and direction for Purwokerto in accordance with the data forecasts and possible trends of this city as presented in the Purwokerto spatial plan 2014-2034.

In a broader sense, the development of Purwokerto is divided into sub-area developments to optimise growth in the whole area. The sub-area developments are also aimed at creating a Purwokerto as the centre of public services and regional economic growths. Each sub-area development (SAD) commonly has different characteristics. Therefore, each different SAD has different growth priorities.

From the spatial development viewpoint, Purwokerto has been formed as a polycentric city with hierarchical activity centres (Sekretariat Daerah Kabupaten Banyumas, 2014). City centre and sub-city centres would be established referring to the intended function of Purwokerto as a centre of government, commercial and service, education, health, and settlement sectors. There will be a city centre and some sub-city centres located in the sub-districts. The city centre and sub-city centres will be used to generate growth, especially through economic activities. However, growth of the city will be guided by a sustainable development with a requirement for green open space with emphasises that a green open space requests a minimum of 10% of many different built-up development areas.

As mentioned previously, one of many functions of Purwokerto is as an economic centre for its covered areas. Hence, Purwokerto is set to attract investment to develop economic activities. Some strategies are carried out using the economic development strategy; e.g. infrastructure provision and incentives regulations.

In accordance with the economic structure, the industry is pointed as an engine of growth for the economic development in Purwokerto. The existence of industries is expected to generate the occurrence of other productive activities. Furthermore, industrial activities will create a multiplier effect of growth for the Purwokerto area (Sekretariat Daerah Kabupaten Banyumas, 2014).

The transport infrastructure provision is also expected to drive the development of commercial zones planned to be placed along with the primary city network. The ease of accessibility and mobility is arranged to boost economic growth in the entire Purwokerto area, especially in term of the connectivity between the centre and sub-centres.

The population scenario and strategies in this section are taken from the Purwokerto spatial planning document. This planning document was enacted in 2014 and will be used as the development guide until 2034.

Regarding its current function and trends that may occur, Purwokerto is predicted to be more attractive for people to work and reside in. Therefore, the Purwokerto population will also grow as a result of both natural growth sand in-migrations. Considering past and current population growths, the population of Purwokerto has as much as 1.3% growth forecast, hence regarding its land capacity, Purwokerto is then directed to have a high-density population with 100 pop/ha.

The population will be distributed to all development areas except the CBD (Sekretariat Daerah Kabupaten Banyumas, 2014). The distribution of population to some development areas will be followed by constructions for settlements in those determined areas. Aside from the equity development in all development areas, this distribution population is carried on concerning social and economic reasons, comfortable and convenient places where communities can grow is one of the social reasons. In terms of the economic motive, CBD is an area that has the highest land prices and value. All of those development plans related to Purwokerto is presented in Table 8.6.

Table 8.6 Development plan for Purwokerto up to 2034 (source: Purwokerto Spatial Planning 2014 – 2034; Sekretariat Daerah Kabupaten Banyumas, 2014)

Development Programs	MtDP* 2				MtDP* 2 (2020-2024)	MtDP* 3 (2025-2029)	MtDP* 4 (2030-2034)
	2016	2017	2018	2019			
Reciting high-density settlements							
Development of local and regional economic centres							
Development of vertical commercial zone on the main roads							
Construction for new intra-city autobus stations in northern Purwokerto							
Structuring and development of micro- industries in sub-development area III and VII							
Enhancement for primary roads capacities							
Enhancement of intra-city roads' capacities							
Construction for Purwokerto – Wonosobo commuter railway							
Development for public integrated transport							
Widening internet coverage and its service for the entire Purwokerto area							
Development of vertical housing in all sub-development areas except the CBD							

* MtDP stands for Mid-term Development Planning

8.5. Chapter summary

This chapter has presented the relevant planning documents relating to the development of Purwokerto. In accordance with Indonesia's city system, Purwokerto's development is based on national, regional, and local scale level plans due to a coherent national development. These different planning documents have the same time horizons. However, some of these documents have different starting and ending time planning. Some keys information can be drawn from this chapter:

- Purwokerto is positioned as a regional development centre in the Southwest Central Java. This position will be developed by strengthening governance, human quality, infrastructure constructions, and connecting between cities and regions.
- Economic development will be strengthened using local potencies.

- Development of the transport service will be mostly concentrated on integrated intramodal and intermodal transportation.

The detailed evidence for these points is presented in Table 8.7.

Table 8.7 Detail information of future evidence in Purwokerto development

No.	Evidence	Can be seen in section/expected implementation year
1	Purwokerto will be set as a regional activity centre for its function as a centre of public service and transport hub in road transport and railway	8.3.1.
2	The economic structure will be formed by service, transport and communication, construction, and the industry as the big four economic sectors	8.3.2
3	Target economic growth rate of about 7% by 2025	8.3.2
4	Agriculture development through research and technology intervention and agriculture infrastructure provision	8.3.2
5	Strengthening intra-city transport infrastructure	8.3.2
6	Development of the regional railway	8.3.3
7	Development of commuter train service for intercity movement Purwokerto-Slawi	8.4.1(2015-2019) 8.4.3(2016-2020)
8	Development of commuter train service for intercity movement Purwokerto-Kutoarjo,	8.4.1 (2015-2019) 8.4.3(2016-2020)
9	Development of cooperation between regencies within Central Java Province through a complementary relationship	8.4.1 (2015-2019)
10	Enhancement and development road intercity infrastructure connecting West Java – Purwokerto – Banyumas – Wonosobo – Secang	8.4.1 (2015-2024)
11	Development of Purwokerto level A bus station	8.4.1 (2015-2019) 8.4.3. (2016-2020)
12	Development of double-tracked railway for the intercity route Cirebon – Purwokerto – Kroya – Solo	8.4.1 (2015-2024) 8.4.5 (2016)
13	Improving human quality by increasing quality of education, religion and technology	8.4.2(2015-2019)
14	Strengthening people participation and empowerment in development	8.4.2(2015-2019)
15	Strengthening economic structure supported by main products that have strategic economic value, quality, and has comparative and competitive advantages in the global market	8.4.2(2020-2024)
16	Development of university facilities within Purwokerto area	8.4.3. (2021 – 2031)
17	Population distribution arrangement	8.4.4 (2016-2020)

No.	Evidence	Can be seen in section/expected implementation year
		8.4.1 (2015-2019)
18	Poverty alleviation through the neighbourhood development program	8.4.4 (2016-2020)
19	Development of local and regional economic centres	8.4.4 (2016-2020) 8.5. (2020-2024)
20	Compulsory 12-year basic education	8.4.4 (2020-2024)
21	Reactivation intercity-commuter railway track served Purwokerto-Purbalingga-Wonosobo	8.4.5 (2017-2021) 8.5. (2025-2034)
22	Development of intercity railway track Cilacap-Purwokerto-Tegal to support industry development	8.4.5(2017-2021)
23	Construction of intra-city public transport station in Northern Purwokerto	8.5 (2014-2018)
24	Structuring and development of micro- industries in sub-development area III and VII	8.5(2014-2018)
25	Development of vertical housing in all sub-development areas except the CBD	8.5 (2025-2034)
26	Enhancement of intra-city road capacity	8.5(2019-2024)
27	Widening internet coverage and its service for the entire Purwokerto area	8.6 (2020-2029)

The collected information in this chapter will then be used as the future evidence in the next chapter to create the future narrative of land use and transport development of Purwokerto. The future city is legally planned in city planning documents. The created narrative in this thesis consistency with the city planning written in city planning documents. It is done as the city planning documents is the most easier to be accepted by city authority in term of the legal plan of the city. This relates to the ultimate impact that thesis want to get, to help the government in seeing the future of the city. Moreover, by doing the disciplinary-future narrative of city growth, this thesis want to encourage people to think the future condition in different way. However, in practice, not all city planning documents cannot accurately do the future prediction. City planning documents have also the time spans that in their implementation possible to not in accordance with the initial plan. It is because world is dynamically changes. Here, an adaptive city planning documents are needed. The adaptive planning means possible revision planning document in the middle of its implementation. This thesis then gives an awareness of this condition by taking into account thoughts and future views regarding a particular case study city.

Chapter 9
Future Narrative for an Indonesian City

9.1. Visioning the future of the city

This chapter aims to create narratives for the future of the city from varied disciplinary perspectives. Using a narrative means explaining the occurrence of certain events by considering a particular perspective. Hence, future narratives are developed by connecting future events in chronological order in accordance with a particular disciplinary perspective. Using the future evidence presented in Chapter Eight (Table 8.6), a narrative will be created following certain steps explained in Chapter Three.

In creating future narratives from different disciplinary perspectives, the taken steps are generally similar to the development of past narratives explained in Chapter Seven. However, since the future is uncertain, evidence in creating future narratives will be represented by development plans and programs. Development programs are used as they represent a collection of activities across a certain time horizon within a particular city. Accordingly, the development plans and programs represent the intended shape of the city.

In this regard, the relationship between future events follows the causal relationship that is represented in the causal loop diagram developed in the past narratives section. For each perspective (transport studies, economy, geography, and sociology) the steps to be followed include: (1) selecting future events, (2) constructing future timeline diagram, (3) developing future event sequence diagram, and (4) developing future narratives.

(1) Selecting future events

This step aims to select the relevant events referring to different disciplinary perspectives. Using the collected events presented in Chapter Eight, each event is sorted through considering a particular discipline perspective. The selection of events also considers the past narrative regarding a particular perspective as it is referred to in developing the past narratives in Chapter Seven.

Considering the causal loop diagram in describing future conditions, it will be useful

to investigate and identify arising possible effects resulting from the occurrence of a particular event. The evidence for this is taken from the long term developments in the past narrative which is created in Chapter Seven. In turn, it will be used to support the construction of future narratives. This section explains the possibility of land use and transport development relationship and changes in land use.

(2) Future timeline diagram

Using a group of events sorted in the previous step and presented in Table 8.6, compiling the future timeline step is an organising a group of events in a sequence. The collected events will then be sequentially arranged into a bar diagram labelled in the future timeline. The future timeline is the material to create a future sequence events diagram.

(3) Future events sequence diagram

In simple terms, a future sequence diagram is created by linking future events following the cause-effect relationship represented by the causal loop diagram of a disciplinary perspective demonstrated in Chapter Seven. Events are picked up from the future timeline of a particular perspective. The events are set out using a causal logic. There are some steps need to be done in order to build a future sequence diagram as follows.

a. Interpreting each event using specific sub-criteria.

   In this process, there is likely to be an academic judgement on which event to choose which potentially represents particular sub-criteria. Informed in Chapter 7, each past event is linked with the sub-criteria and connected with other events in a causal relationship manner. The same process is taken in this section, following a similar method.

   Considering the academic judgement is needed to define whether a future event is relevant to a particular variable event and it is not a trivial task. Awareness of the relevant events in relation to particular sub-criteria needs to be considered. The judgement might not fit well, but it helps to describe what will likely happen.

b. Defining a connection between two events following the logical thinking depicted in the causal loop diagram in Chapter 7

   This involves a process to connect one event to another following the causal relationship in the causal loop diagram depicted in Chapter 7. Two events are linked following the connection between two variables - which also represents a

connection between sub-criteria, in the causal loop diagram.

c. Combining the events and their causal relationship to create a future event sequence diagram

Using the information and knowledge provided from previous steps (chosen events and the relationship between events), this step combines the information to build a diagram depicting chronologically ordered city development. Compiling events into a future event sequence diagram is proven to be challenging, especially in matching events into particular positions in the causal loop diagram. Accordingly, in linking two events the type of connection will be better to follow the arrow direction for each event. As an example when connecting future event in Criteria-Sub-criteria 'Other causes of growth-Institution and government policy' could be connected with either 'The role of city planning-City planning drive the city growth' or 'City characteristic-Facilities provision'.

(4) Future narratives of transport and land use development

A narrative is written as a description and explanation for the future sequence event diagram. The future narrative provides an explanation of the relationship between events.

In visioning the future condition of Purwokerto city, there is an issue that goes along its development i.e. information technology. Development of information and communication technologies will obviously lead to potential implications for city life. The idea of automatic control and computerised access might change the city growth in the future. Here the transport pattern and citizen activities would be a simple example. Some considerations such as efficiency, optimisation, predictability, convenience, and security will be pointed out in developing an area.

Regarding this issue, Purwokerto City authority has already been aware of future technology development regarding its city growth. It can be seen from the city development policy concerning with internet coverage. In this regard, city authority has already considered information technology in the future development of Purwokerto. The information technology is believed to be associated with some city development aspects, e.g. city management, reducing the traffic volume. There are some components that can offer a better quality life in accordance with sustainable and efficient life cost.

The sustainable development issue is to be considered in visioning the future

development of the city. In this point of view, there is a conflict between economic development and environmental issues. The growth of a city in the economic perspective that is expressed in city development policy is concerned with how a specific area is pushed to develop using its potential resources to gain an increasing income, money flow, and revenue. In this regard, economic growth policies e.g. focusing on encouraging the industrial area to produces, usually underestimates the importance of other related issues, especially the environment

9.2. Transport studies.

9.2.1. Selected future events

The selection of future events considers the transport studies perspective. It also regards some thoughts in the Purwokerto development in the past and its possible future developments.

Following a particular transport perspective used in Chapter Seven, each event is selected with the consideration against 10 sub-criteria presented in Figure 7.2. These sub-criteria are A1 (autonomous spatial perspective), B2 (transport is an effect of city growth), C1 (city planning drives city growth), D1 (institution and government policies), E2 (developing countries), G1 (population), G3 (Economic), and G4 (geographical boundary), H1 (vehicle ownership), and I2 (facilities provision). Accordingly, Table 9.1. presents a group of events that will be used in creating the future timeline diagram.

Table 9.1 Group of Events from A Transport Studies Perspective (picked from table 8.6.)

No. in Table 7.6	Events	Expected implementation year
5	Improvement of intra-city transport infrastructure	commenced in 2014
11	Development of Purwokerto level A bus station	2016-2020
16	Development of university facilities within Purwokerto area	2021 – 2031
17	Population distribution arrangement	2016-2020
19	Development of local and regional economic centres	2020-2024
23	Construction of intra-city public transport station in Northern Purwokerto	2014-2018
24	Structuring and development of micro- industries in sub-development area III and VII	2014-2018
25	Development of vertical housing in all sub-development areas except the CBD	2025-2034
26	Enhancement for intra-city-road capacity	2019-2024

9.2.2. Future timeline diagram

Considering the plans for Purwokerto presented in Chapter Eight, the growth of Purwokerto in the future is intended to arrange Purwokerto as an integrated area. The integration will be achieved by connecting all parts of the area with sufficient transport infrastructure. It will later be expected to boost the growth of economic activities across area.

Using relevant events selected from Table 8.6, a timeline diagram presented in Figure 9.1. depicts events in the growth of Purwokerto over a 20-year time horizon. This diagram is presented in a four-time segment labelled MTDP (Medium-Term Development Program) following spatial planning time justification.

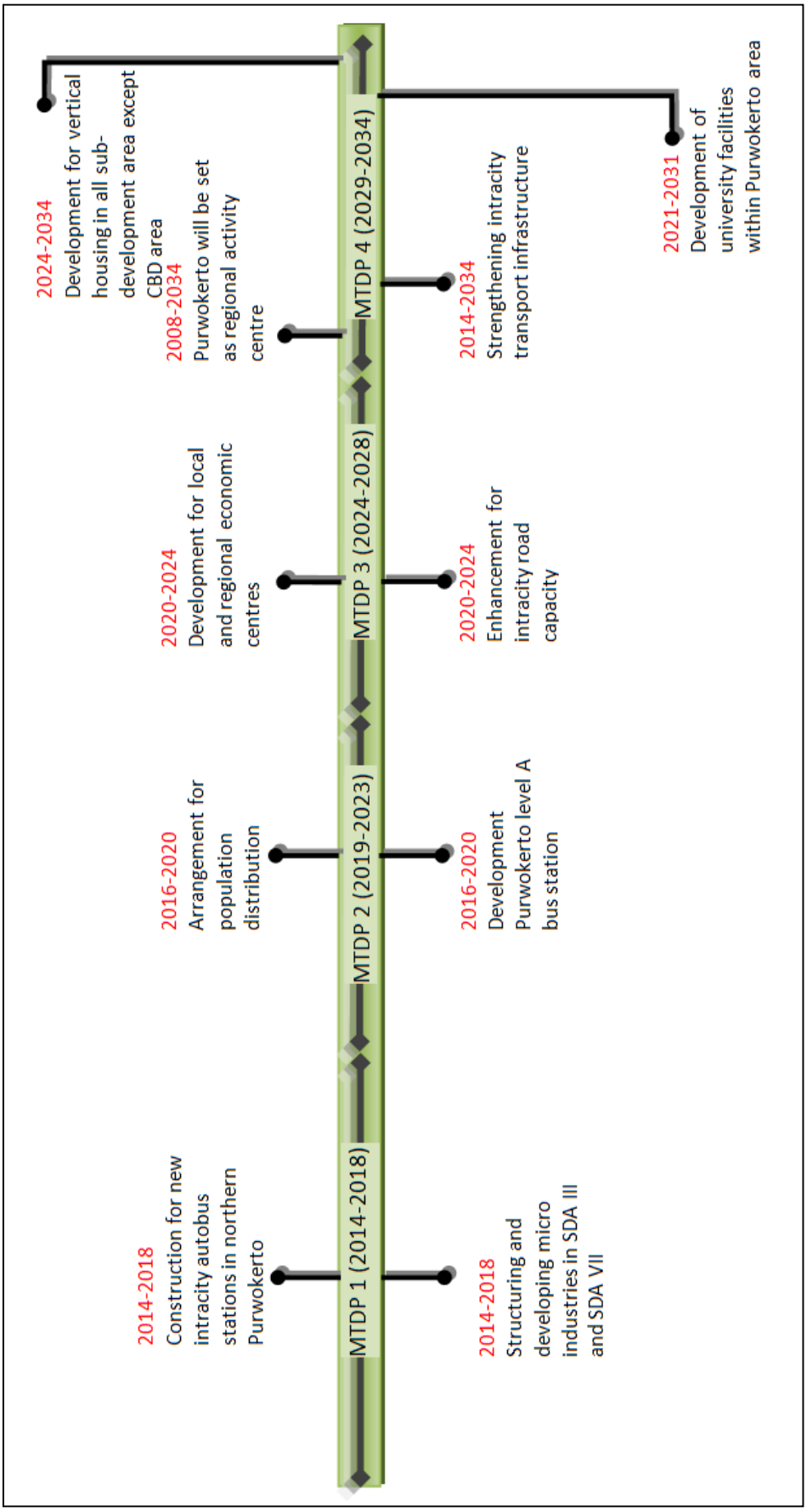

Figure 9.1 Future timeline diagram of Purwokerto case study from a transport studies perspective

9.2.3. Future event sequence diagram

The future event sequence diagram presented in Figure 9.2. is created by following the causal loop diagram in Figure 7.2. The causal relationships are then used to link the future plans representing future events which are taken from Figure 9.1. There are two steps required: (1) interpreting the causal loop diagram's variables, and (2) compiling events into a future event sequence diagram.

(1) Interpreting future event dealing with the causal loop diagram's variables

Future events from the future timeline in this section are interpreted as the sub-criteria from the causal loop diagram presented in Figure 7.2. There is a judgement process required in order to determine the criteria for each future event. This judgment is shown in Tabel 9.2.

(2) Compiling events into the future event sequence diagram

The result of this process is presented as a future sequence events diagram shown in Figure 9.2.

Table 9.2 A transport studies perspective for future events position determination

No	General information of Purwokerto taken from Table 7.1.	Criteria	Sub-criteria	Future event	Additional comment
1	Purwokerto's position has firstly encouraged utilising its own potentials to develop this city. The presence of the transport network boosts its growth.	Spatial perspective	Autonomous (A1)	Structuring and development of micro-industries in sub-development area III and VII	Growth of Purwokerto will be supported by Purwokerto's potentials. The emergence of micro industries exploits local products and will potentially produce the transport network.
2	Transport is provided to serve arising activities and land use development	The role of transport	Transport is an effect of city growth (B2)	Construction of intra-city public transport station in Northern Purwokerto	Purwokerto growth is directed to all sub-development areas. The southern area will be served by Purwokerto central station. Accordingly, the southern sub-station will be the centre of transport service for the rest of the area.
3	Development of some new areas is designed to reduce and spread the growth in the former activity centre.	The role of city planning	City planning drives the city growth (C1)	Strengthening intra-city transport infrastructure	Easy of intra-city transportation will be part of city development to distribute the growth across the entire city area.
4	Government policies attempt to push the growth of mobility, the economy, and welfare.	Other causes of growth	Institution and government policy (D1)	Arrangement of population distribution	Population distribution is one of the government policies in spreading development.

No	General information of Purwokerto taken from Table 7.1.	Criteria	Sub-criteria	Future event	Additional comment
5	Urbanisation in Purwokerto generates the occurrence of dense and varied activities.	Type of country	Developing countries (E2)	Development of Purwokerto level A bus station	The presence of Purwokerto central bus station and its enhancement will generate the occurrence of other activities around it.
6	--	City/regional type	Not concerned	--	--
7	• Growth of population in Purwokerto is a consequence of presence of many universities, in-migration attracted by job provision. • Economic activities in Purwokerto serve a region in the southwest of Central Java Province. Urbanised area of Purwokerto city has become wider.	City Definition	• Population (G1) • Economic (G3) • Geographical boundary (G4)	• Development of local and regional economic centres • Development of university facility within Purwokerto area	• As a centre of economic growth, Purwokerto is facilitated by numbers of economic facilities with serve regional scale. Currently it attracts and also encourages investment to boosts economic growth and jobs provision. • The presence of university in Purwokerto could be seen as the changes the area whereas the universities are located into urbanised area regarding e.g. growing of built up area, economic structure, and population.
8	The need for easier mobility is of the reasons	Transport provision	Number of vehicle	Enhancement for intra-city-road capacity	Proving of better intra-city road aims to give a high mobility to boost the movement

No	General information of Purwokerto taken from Table 7.1.	Criteria	Sub-criteria	Future event	Additional comment
	why Purwokerto has high vehicle ownership. This is mainly motor-cycle ownership.		ownership (H1)		between places.
9	Urban facilities are provided in-line with the activity development. Purwokerto started to growth then in accordance with enlargement urban facilities provision.	City characteristic	Facilities provision (I2)	Development of vertical housing in all sub-development areas except the CBD	The consequence of city growth is higher density. Furthermore built-up area is likely to extend. Therefore, vertical housing will be a solution to land scarcity.

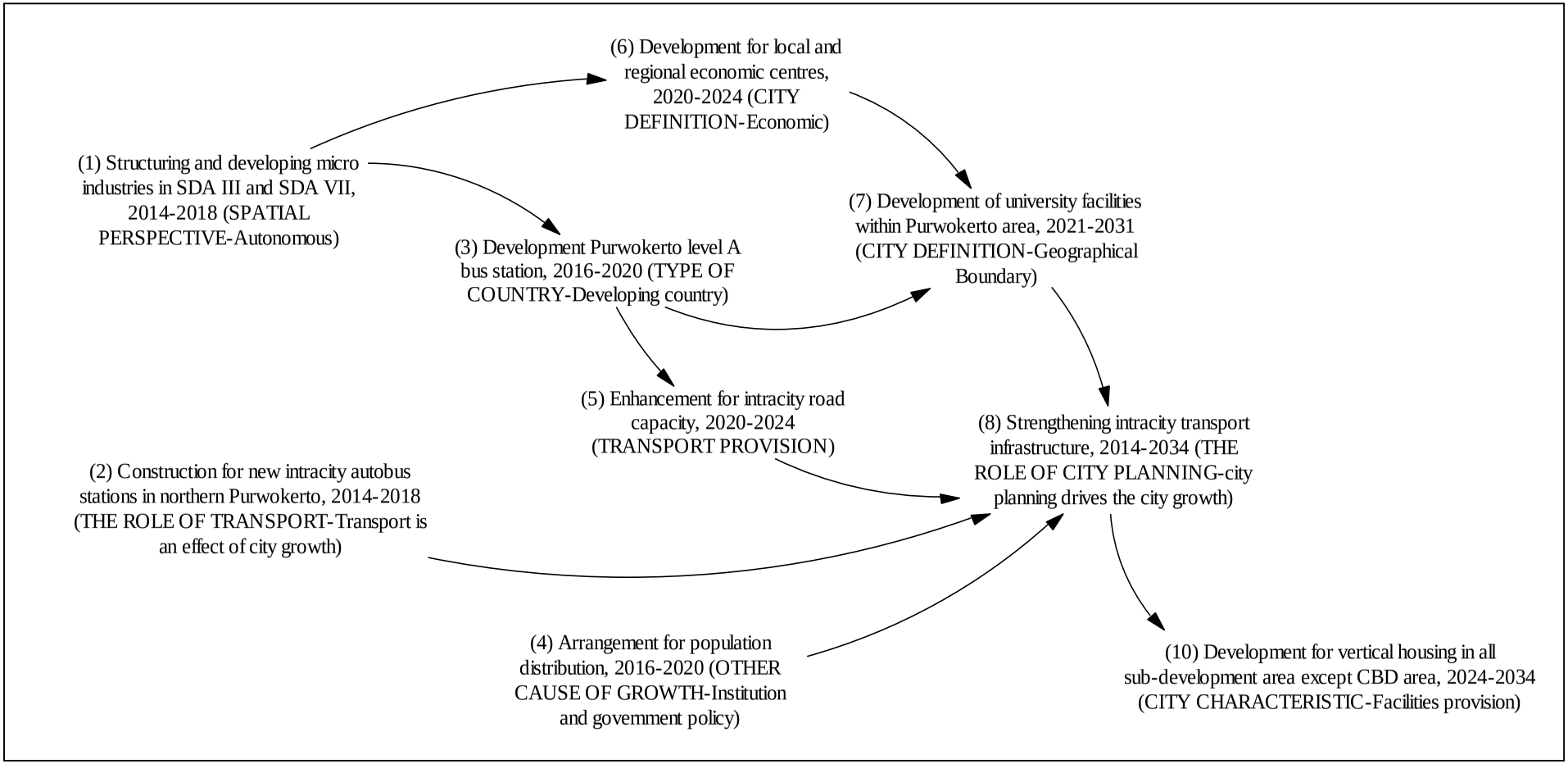

Figure 9.2 A Future Sequence Timeline Diagram from a Transport Studies Perspective

9.2.4. Future narrative of transport and land use development from transport studies perspective

Transport provision will engage with development across Purwokerto. The allocated facilities stated in the Purwokerto city planning will be followed by transport infrastructure provision. There will be organising and developing micro-industries in sub-development areas III and VII from 2014 to 2018 to be in parallel with the construction of a new intra-city bus station in northern Purwokerto. The existing bus stations are Purwokerto central bus station in the south and an autobus station in the city centre. Therefore, the new autobus station may potentially serve as transport activity centre to anticipate the growth of mobility in other areas of Purwokerto. Whilst the strong and organised micro industries will likely strengthen local and regional economic, especially in Purwokerto. This condition will lead then to characterise the economic structure of Purwokerto and in turn, will influence the occurrence of other activities as it usually happens in city development process. This will also be supported with the local and regional development centres in Purwokerto that will develop in 2020 to 2024.

On the other side, microeconomic as the root of the community economic-activities will play an important role in strengthening community income. For the reason of fulfilling their needs and goods collecting and distribution, a settled income will drive the more trip from one to other places. It will then need the increasing quality and quantity of transport facilities including the bus station and road capacity. It is because the growth of intercity and intra-city public transportation need a better and wider central bus station to accommodate the increase of trips and buses. The natural function of a bus station is a point where the trip begins or end. There is also the waiting activity before the passengers departing. Thus, a bus station is a place where vehicles and passengers with all of the followed activities. Once the needs for transportation becomes bigger then more developments for the bus station is needed. The presence of a redeveloped central bus station will be included in the population development plans to support people mobility. In this respect, there will be a redevelopment of the existing Purwokerto’s bus station level A from 2016 to 2020 to also create a balanced growth of this city area.

The wide distribution of population in Purwokerto area from 2016 to 2020 will also be expected to distribute the economic growth and transport provision. It is because the spreading of the population across Purwokerto area will generate the economic activities and will also spread the development across Purwokerto area. The growth of population and its distribution will potentially generate the demand for larger transport provision of both infrastructures and modes. Therefore, the roads capacities will need to be potentially enhanced in 2014-2020, especially for intra-city-primary roads.

The enhancement of intra-city road capacity program in 2020-2024 will potentially answer the needs for transport. The provision of transport, in turn, will be able to generate economic development since it promotes the ease of mobility and accessibility between different land uses within the Purwokerto area. This condition, easy mobility and accessibility, is beneficial for Purwokerto as Purwokerto will be set as a local and regional economic centre by 2034. A centre of growth obviously must have a strong economy from where the trickle-down effect come from. Further, this condition will likely support the economic growth rate achievement that is projected to be about 7% by 2025.

Furthermore, intra-city transport infrastructures will be improved over 2014-2034 to increase the transport provision. This will be expected to fulfil the possibility of increasing mobility for Purwokerto regarding the policy of population distribution over the entire Purwokerto area potentially the growth of economic activities. This development will be expected to accommodate the dynamic of people's daily activities and also the industry-production distribution and process through better connectivity between places within Purwokerto urban area. Moreover, the development of higher education facilities from 2021 to 2031 will be presumed to generate intra-city movements due to the presence of more than 20 colleges and universities located within the Puwokerto's area.

9.3. Economy perspective

9.3.1. Selected future events from an economy perspective

A future narrative that will be created on the other part of this section considers the certain sub-criteria mentioned in Chapter Seven (section 7.3). This is a particular economist perspective concerning some sub-criteria: autonomous growth, transport

drives the growth of the city, city planning does not explicitly consider as a factor, institution and government policies, developing countries, monocentric city, population and economic, number of vehicle ownership, and facilities provision.

Later, certain future plans are defined to represent future events from an economist perspective and can be seen in Table 9.3.

Table 9.3 A group of events from an economy perspective (selected from table 8.6.)

No. in Table 8.6	Events	Can be seen in section/expected implementation year
3	Target economic growth rate of about 7% by 2025	2005-2025
11	Development of Purwokerto level A bus station	2016-2020
15	Strengthening economic structure supported by main products that have strategic economic value, quality, and has comparative and competitive advantages in the global market	2020-2024
16	Development of university facility within Purwokerto area	2021 – 2031
17	Population distribution arrangement	2016-2020
19	Development of local and regional economic centres	2020-2024
23	Construction of intra-city public transport station in Northern Purwokerto	2014-2018
24	Structuring and development of micro- industries in sub-development area III and VII	2014-2018
25	Development of vertical housing in all sub-development areas except CBD	2015-2034
26	Enhancement of intra-city road capacity	2020-2024
27	Widening internet coverage and its service for the entire Purwokerto area	2020-2029

9.3.2. Future timeline

Figure 9.3. shows a future timeline diagram for Purwokerto from an economic perspective. Using government development plans presented in Chapter Eight, a future timeline is created in this section. A number of future events taken from Table 9.3 are presented in chronological order.

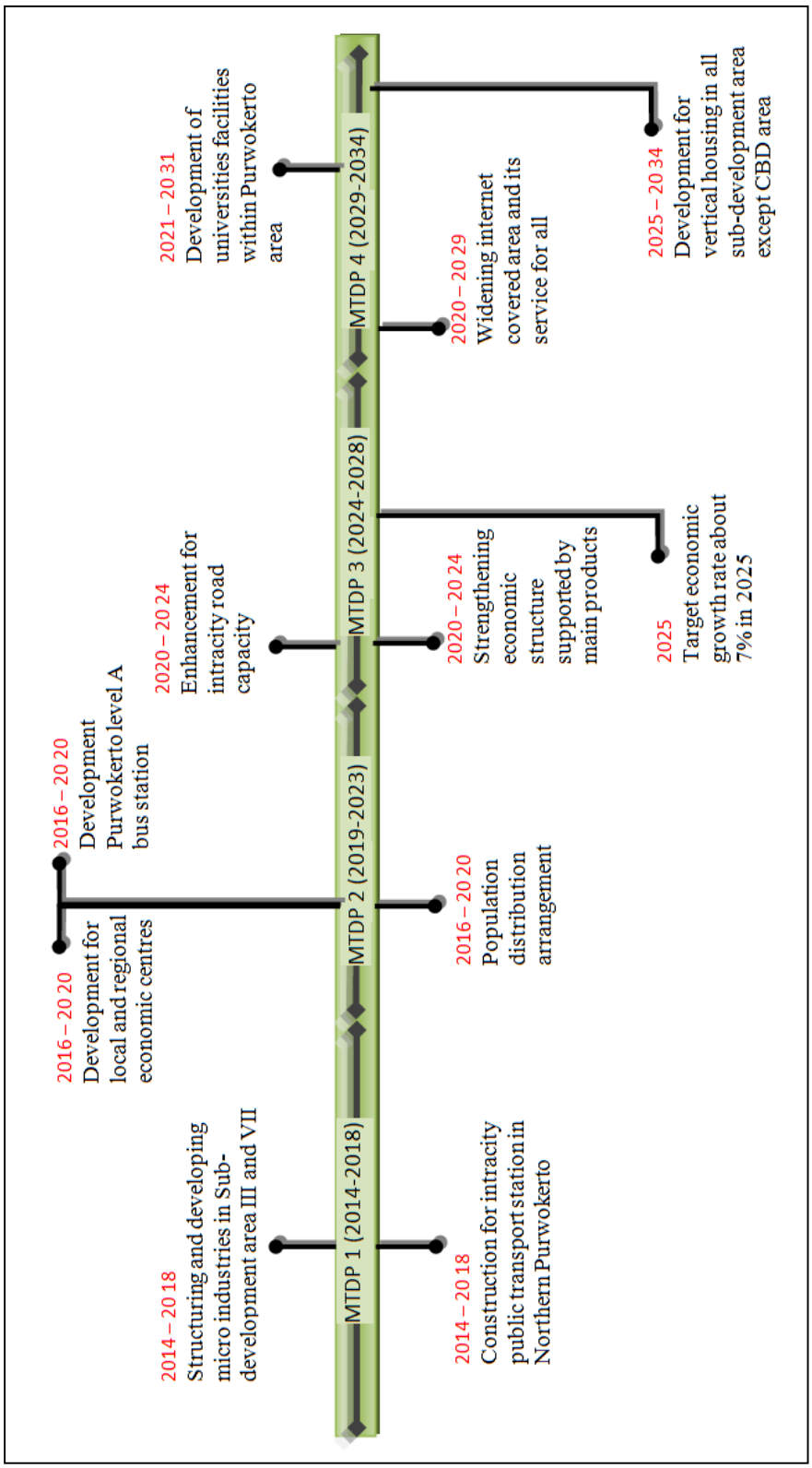

Figure 9.3 Future timeline diagram for Purwokerto case study from an economist perspective

9.3.3. Future event sequence diagram

An economist perspective for the future events sequence diagram is presented in Figure 9.4. In this diagram, the causal relationship between events follows the logical thinking presented in Figure 7.7.

Furthermore, in order to create a future event sequence diagram, certain steps need to be undertaken. Resulting from selection process for the relevant events of Purwokerto city considering a particular economy perspective, Table 9.4 is populated. This table also determines the position of future events into relevant sub-criteria.

Table 9.4 An economist perspective's future event position determination

No	General information of Purwokerto taken from Table 7.2.	Criteria	Sub-criteria	Relevant future event considering sub-criteria	Additional information
1	Purwokerto economic growth is largely based on its resources. The growth mostly depends on its own economy rather than relying on other places. Purwokerto becomes the centre of growth for its surrounding areas.	Spatial perspective	Autonomous (A1)	Strengthening economic structure supported by main products that have strategic economic value, quality, and has comparative and competitive advantages in the global market.	Local economies are developed through local resources to strengthen Purwokerto economy.
2	Transport service (railways and roads) in Purwokerto are improved to serve certain activities that already exist.	The role of transport	Transports as an effect of city growth (B2)	• Enhancement of intra-city road capacity • Development of level A Purwokerto's bus station • Construction of intra-city public transport station in Northern Purwokerto	The enlargement of road capacity conducted by considering enhancing mobility and movement between land uses within the Purwokerto area.
3	In its experience of development, some essential activities located in Purwokerto generate the presence of labour to fulfil their employment requirements. In turn, the growth of activities encourages the occurrence of qualified labour which then creates the collection of individual skills and knowledge offering economic value.	Other causes of growth	Human capital (D2)	Population distribution arrangement	An aim of population distribution is to spread out a number of available labours to fill the requirement of industrial workers. Other important purpose is to distribute population density and facilities across area.
4	Urbanisation in Purwokerto generates the occurrence dense and varied activities.	Type of country	Developing countries (E2)	Widening internet coverage and its service for the entire Purwokerto area	Purwokerto grow into a modern city with the need for easy and boundless connection. All activities,

No	General information of Purwokerto taken from Table 7.2.	Criteria	Sub-criteria	Relevant future event considering sub-criteria	Additional information
					especially economic, will grow further facilitated by internet provision.
5	Purwokerto has attractive activities to agglomerate. This agglomeration grows as a compact and dense area.	City/regional type	Monocentric city (F1)	Development of local and regional economic centres	In turn, Purwokerto grows as a polycentric city. In its development it is divided into 8 sub-development areas. Each sub-development area is developed into specific development area. Accordingly, there are 8 activity centres including the primary city centre as the Centre Business District (CBD)
6	Population of Purwokerto has increased and has affected economic activities.	City definition	Population (G1) and economic (G3)	• Development of vertical housing in all sub-development areas except CBD	• Purwokerto population is predicted to gradually increase as a result of both natural growth and in-migration including students. Consequently, the greater population needs more housing to settle. However, land limitation encourages the changes of housing style from horizontal to vertical.
				• Structuring and developing micro-industries in sub-development area III and VII • Target economic growth rate of about 7% by 2025	• Varied economic activities grow across the entirety of Purwokerto. For developing people's economic activities, government concerns to the development of micro industries

No	General information of Purwokerto taken from Table 7.2.	Criteria	Sub-criteria	Relevant future event considering sub-criteria	Additional information
7	The infrastructure provision has empirically generated the occurrence of activities and play a role in growth of economic in Purwokerto	City characteristic	Facilities provision	Development of university facility within Purwokerto area	The existence of some universities has obviously generated the emergence of other activities. On the other hand, Purwokerto becomes a favourite place for student to study. Therefore, the development of more university facilities accommodates more students to study in the city. In turn more economic activities also emerge in line with increasing students.

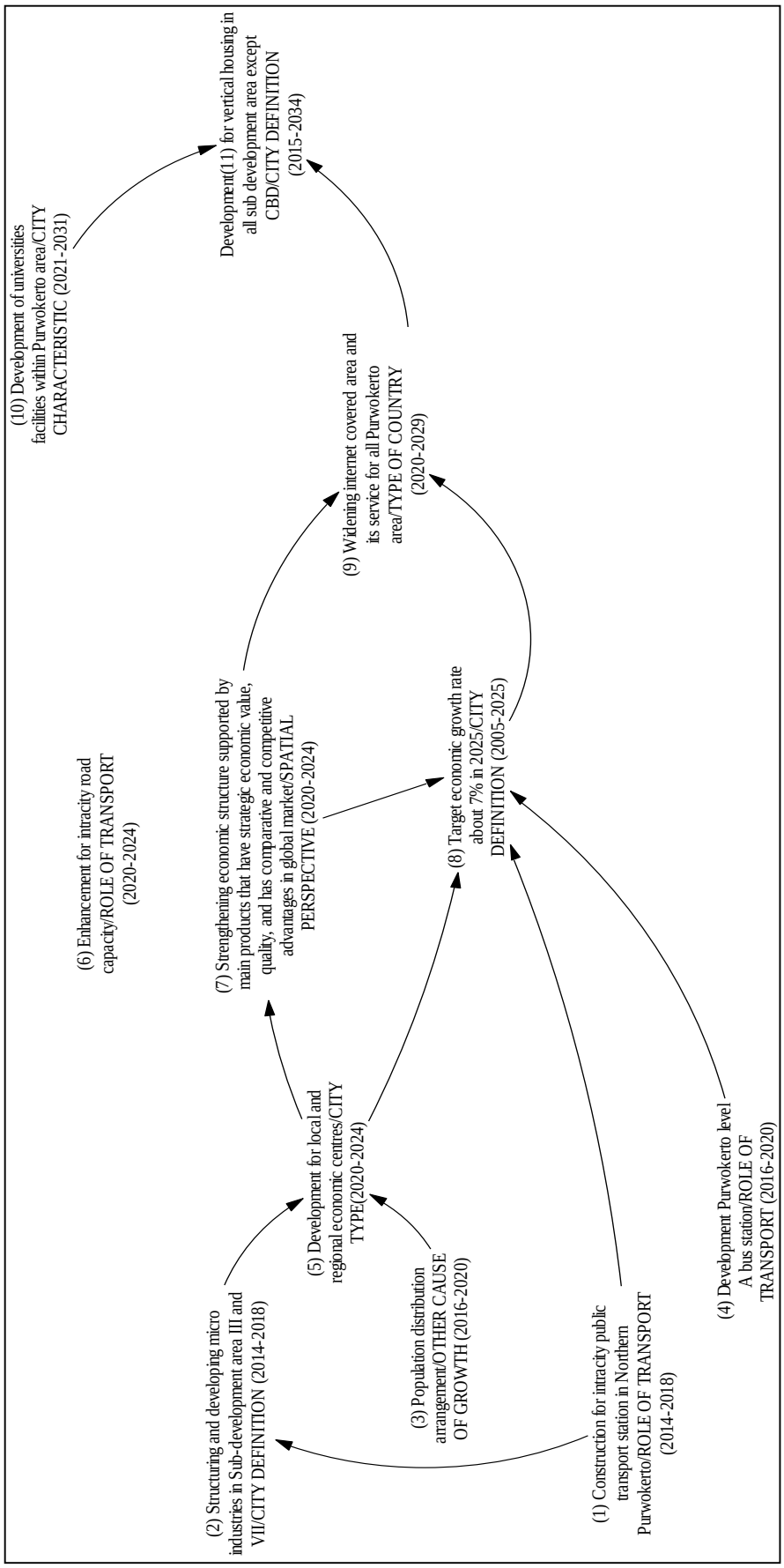

Figure 9.4 A future sequence timeline diagram from an economist perspective

9.3.4. Future narrative of transport and land use development from an economy perspective

According to the Purwokerto local plan 2014-2034, each sub-development area of Purwokerto is set to be the centre and sub-centre of activities with different concentrations. These centre and sub-centres are connected by roads that transport both people and goods between places. The presence of bus stations, in this regard, plays a role in transportation itself and also in the developing area. Both positions promote easier modal changes and trigger the growth of the surrounding area where the bus stations are located. In 2014 to 2018, the intra-city public transport station in the Northern Purwokerto will be constructed (1). Accordingly, this public transport station is expected to encourage higher growth of economic activities in this area, especially sub-development area III and VII. In this regard, sub-development area III and VII- will be developed as micro industries centres for Purwokerto in 2014-2018 (2).

Population distribution (3) will likely become a strategy to distribute human capital. It is because the relationship and interaction between people will potentially share and transfer skills, education and technology.

Incorporating population distribution and structuring and developing micro industries in sub-development areas III and VII will then play a role in the development of Purwokerto to be a local and regional economic centre (5). In this respect, Purwokerto is set as a national growth centre, including being an economic centre, for the southwest part of the Central Java area. This city is located in a regional crossing point of roads and railways connecting some important places in the southern part of Central Java. As a local and regional economic centre, Purwokerto will become a centre of economic activities. Purwokerto will be expected to generate the growth of economic for its covered area. The growth of Purwokerto as an economic centre will be followed by the growth of its surrounding area to construct an integrated development with other places. Hence, Purwokerto's role as an economic centre on both a local and regional scales will encourage the enhancement of intra-city road capacity in 2020-2024 (6) to cater for increasing movements between the economic centres. The development of local and regional economic centres is also likely to support the improved economic structure (7).

On the other hand, the existing Purwokerto bus station will be enlarged into some bus

stations with better facilities in 2016-2020 (4). This development will likely support the growth rate of the economy in accordance with the improvement and enlargement of the capacity of mobility that connects Purwokerto with other places. The transport provision will later facilitate the economic growth target of about 7% in 2025 (8). Transport, in this regard, plays a role in improving the connection between activity centres. Regarding the economic road map of Purwokerto, the 7% growth rate for Purwokerto will potentially be achieved with the support of Purwokerto's big four economic sectors: transport, communication, construction, and industry. In turn, it will play an essential role in strengthening the economic structure (7).

Moreover, the available transport infrastructure capacity will enhance development activities including the development of university facilities in 2021-2031. There are numerous universities spread throughout Purwokerto area with thousands of students. The implication of this university enlargement will be an increasing capital flow in Purwokerto which, in turn, will potentially generate the occurrence and growth of supporting educational activities.

Furthermore, Puwokerto will likely continue to grow following global trends as the internet becomes a necessity for everyday life as well as economic activity. Currently, internet coverage is not over the entire area of Purwokerto. In 2020-2029, the internet service area will be enlarged to cover the entire Purwokerto area (9). The provision of infrastructure and facilities will then be expected to encourage settlement in Purwokerto through constructing vertical housing in 2015-2034.

9.4. Geography perspective

9.4.1. Selecting future events

Referring to the creation of the past narrative in Chapter Seven, an approach for geography perspective is chosen. This approach incorporates a number of sub-criteria, i.e. regional perspective, transports driving the growth of the city, city planning driving the city growth, institution and government policies, developing countries, population, economic, geographical boundary, transport infrastructure provision, and geographical location. These sub-criteria, which are deliberated to select a group of future events are presented in Table 9.5.

Table 9.5 A group of events from a geography perspective (selected from table 8.7.)

No. in Table 8.6	Events	Expected implementation year
1	Purwokerto will be set as a regional activity centre for its function as a centre of public service and transport hub in road transport and railway	Commenced 2008
2	The economic structure will be formed by service, transport and communication, construction, and the industry as the big four economic sectors	Commenced 2014
7	Development of commuter train service Purwokerto-Slawi	2016-2020
8	Development of the commuter train service Purwokerto-Kutoarjo	2016-2020
10	Improvement and development road infrastructure connecting West Java – Purwokerto – Banyumas – Wonosobo – Secang	2015-2024
11	Development of Purwokerto level A bus station	2016-2020
12	Development of double-tracked railway for the intercity route Cirebon – Purwokerto – Kroya – Solo	2015-2024
16	Development of university facility within Purwokerto area	2021 – 2031
17	Population distribution arrangement	2015-2019
19	Development of local and regional economic centres	2020-2024
21	Reactivation of commuter railway track serving Purwokerto-Purbalingga-Wonosobo	2025-2034
22	Development of Cilacap-Purwokerto-Tegal railway to support industry development	2017-2021
23	Construction of intra-city public transport station in Northern Purwokerto	2014-2018
24	Structuring and development of micro- industries in sub-development area III and VII	2014-2018
25	Development of vertical housing in all sub-development areas except the CBD	2025-2034
26	Improvement of intra-city road capacity	2020-2024

9.4.2. Future timeline diagram

Using the presented events in Table 9.5, Figure 9.5 follows a timeline according to the expected year of implementation. These events are then grouped into four medium time horizons following the time segment of the long-term development horizon from the Purwokerto spatial plan.

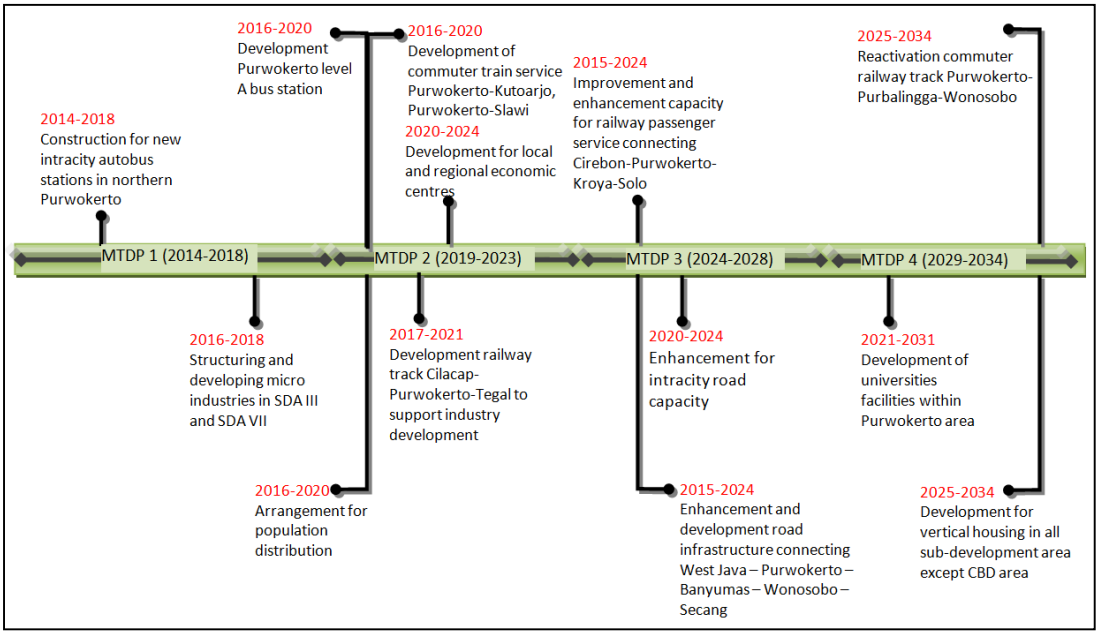

Figure 9.5 Future timeline diagram for Purwokerto case study from a geography perspective

9.4.3. Future event sequence diagram

As previously mentioned in section 9.1., a few steps have been followed to create a future event sequence diagram from a geography perspective presented in the academic judgement. The academic judgement is used to define future events used in the future event sequence diagram from a geography perspective (Table 9.5).

There is a judgement process required in order to determine the criteria for each future event. This judgment is shown in Table 9.6. Future events from the future timeline in this section are interpreted as the sub-criteria from the causal loop diagram presented in Figure 7.11. These steps are combined into a future event sequence diagram presented in **Figure 9.6**.

Table 9.6 A geographer perspective's future events position determination

No	General information of Purwokerto taken from Table 7.11.	Criteria	Sub-criteria	Future event	Additional comment
1	Purwokerto is a centre of activities for the southwest of Central Java province. Its activities influence the growth of its coverage area.	Spatial perspective	Regional perspective (A3)	Purwokerto will be set as a regional activity centre for its function as a centre of public service and transport hub in road transport and railway for its covered area.	Currently, the Indonesian Government is improving railway services through constructing a double track railway system in Java island. This infrastructure will enhance the connectivity between cities, including Purwokerto, in Java's railway system. The double track will also provide for commuting travel between cities to enlarge the regional relationship.
2	Transport activities direct spatial development. The emergence of new activities follows the existence of transport.	The role of transport	Transports drives the growth of the city (B1)	• Development of Purwokerto level A bus station • Development of railway service Cilacap-Purwokerto-Tegal to support industry development • Construction of intra-city public transport station in Northern Purwokerto • Reactivation of commuter railway track Purwokerto-Purbalingga-Wonosobo	• The development of the bus station is one activity that generates multiplier effect in Indonesia's city growth. The presence and enhancement of the Purwokerto bus station will potentially accelerate growth to its surrounding areas. • Providing a railway service connecting Cilacap-Purwokerto-Tegal will potentially generate and accelerate the growth of industrial activities. • The presence of a public transport station in the Northern part of Purwokerto area will generate much more this particular area since northern Purwokerto has grown as a settlement area. • These three places (Purwokerto, Purbalingga, and Wonosobo) are currently linked by road transport and served by buses. The growth of Purwokerto as an activity centre has stimulated the surrounding area and enhanced mobility between these places.

No	General information of Purwokerto taken from Table 7.11.	Criteria	Sub-criteria	Future event	Additional comment
3	City planning in Purwokerto guides the development direction. Spreading of activities and settlement as stated in the Purwokerto Spatial Planning generates and pushes the growth to the intended areas.	The role of city plan	City plan drives the city growth (C1)	Arrangement of population distribution	Population arrangement is a part of Purwokerto spatial planning program. It delivers population into each sub-development area within Purwokerto area in order to distribute the development across the Purwokerto area.
4	Government policies regarding leading activities and poverty alleviation has driven spatial development i.e. spatial growth direction, increasing living environment quality.	Other causes of growth	Institution and government policies (D1)	Structuring and development of micro-industries in sub-development area III and VII	The micro-industries have already existed in sub-development areas III and VII. However, they have not been well managed. Structuring and developing micro industries will then propose the development area.
5		City definition	Economic (G3);	Development of local and regional economic centres	The development of economic activities in Purwokerto provide more growth opportunities. Therefore, Purwokerto will be more attractive to visit.

No	General information of Purwokerto taken from Table 7.11.	Criteria	Sub-criteria	Future event	Additional comment
6	Increasing transport infrastructure provision provides easy movement and generates new settlement away from initial centre.	Transport provision	Transport infrastructure provision (H2)	• Enhancement of intra-city road capacity • Development of double-tracked railway for the intercity route Cirebon – Purwokerto – Kroya – Solo • Enhancement and development road infrastructure connecting West Java – Purwokerto – Banyumas – Wonosobo - Secang • Development of commuter train service Purwokerto-Slawi; Purwokerto - Kutoarjo	The transport development for Purwokerto basically facilitates growth of Purwokerto for its function as centre of activities both local and regional. Intercity transport will more connect between sub-development areas which have their specific function in Purwokerto development, whilst intra-city transport will increase and ease movement.
7	Number of facilities and facilities' coverage area in Purwokerto has grown along with its role in the region.	City characteristic	Facilities provision (I2)	• Development of university facility within Purwokerto area • Development of vertical housing in all sub-development areas except the CBD	• In its development, Purwokerto became a destination place of study for various reasons, e.g. comfort and lower living cost than other places. Therefore, the development of universities facilities e.g. increasing student capacity and university facility services will attract not just student but also non-student to come. • Vertical housing is needed to fulfil the needs for settlement facilities in across the Purwokerto region due to population growth. Changing the housing type from horizontal to vertical is concerned considering land scarcity.

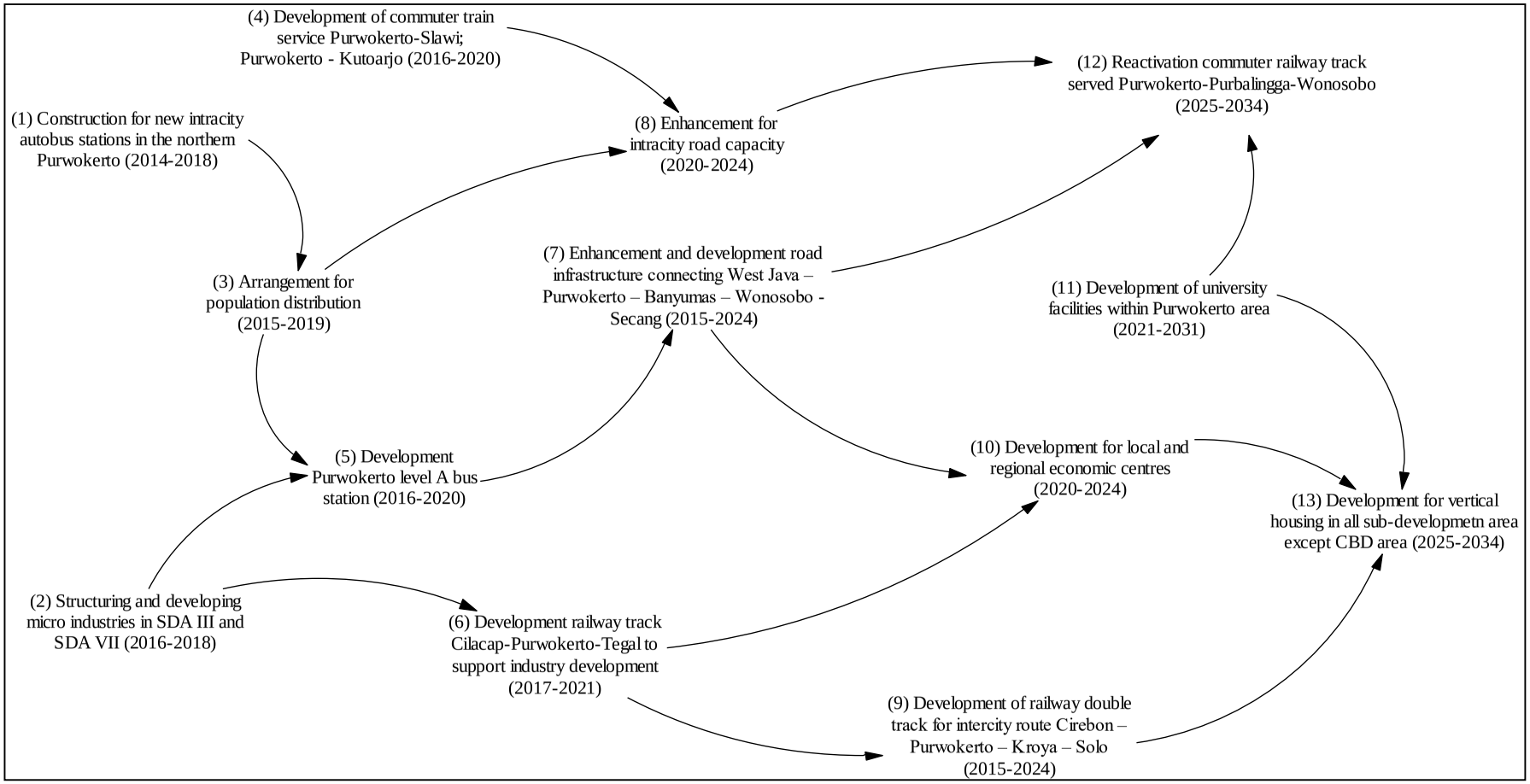

Figure 9.6 A Future Sequence Timeline Diagram from a Particular Geography Perspective

9.4.4. Future narrative of transport and land use development from a geography perspective

City activities will be distributed across the Purwokerto area in accordance with each sub-development area's (SDA) potential. The CBD, furthermore, will be set in SDA I, V, and VI as seen in Figure 5.7. Therefore, the construction of a new intra-city autobus station in northern Purwokerto from 2014 to 2018 will potentially serve public transportation in other parts of Purwokerto. Hence, the presence of transport infrastructure will provide greater ease of movement since the government will arrange the population distribution from 2015 to 2019. The population distribution will be concentrated beyond the CBD due to some reasons: development of all the Purwokerto area, current high population density in the CBD, and supporting development activities in Purwokerto's SDAs.

The development of activities – especially economic, will consequently attract people to work in other activity centres beyond Purwokerto. The development of the intercity commuter train service connecting Purwokerto-Slawi in the north and Purwokerto-Kutoarjo in the south will provide a mobility service within the Purwokerto service area from 2016 to 2020. In turn, it will then possible to generate better Purwokerto intra-city transport. The potentially increasing intra-city transport will also be caused by the population distribution across the Purwokerto's sub-development areas. Therefore, there will be an enhancement of intra-city roads capacity in 2020 to 2024 to serve increasing transport demand. These roads connect activity centres across all of Purwokerto's SDAs.

Purwokerto will also develop its industries since the structuring and developing micro-industries in SDA III and SDA VII in 2016 to 2018 might realise the local government's aim to escalate industrial support in economic structure for Purwokerto. The growth of industries will contribute to the increasing demand for transport. Accordingly, together with strengthening the transport infrastructure in the northern part of Purwokerto these activities will influence the needs for the development of Purwokerto level A bus station between 2006-2020. A level A bus station is the highest standard of a bus station in Indonesian bus-station classification. It serves all public bus journeys – local, regional, and national. In turn, enhancing capacity and increasing services from Purwokerto bus station will also provide a better transport hub for intercity transport. A better bus station in Purwokerto supports the

enhancement and development of road infrastructure connecting West Java and Central Java, serving the Purwokerto-Banyumas-Wonosobo-Secang route in 2015 to 2024. This road infrastructure is likely to be important as it will connect growth centres in the south of Java Island and activity centres in the northern Java.

The development of city activities and better intra-city transport will potentially increase Purwokerto's attractiveness for connecting to other places. Hence there may be an increasing demand for intercity transport to serve commuters. Accordingly, a Reactivation of the commuter railway serving Purwokerto-Purbalingga-Wonosobo will be conducted from 2025 to 2034. This track served railway transport in the past for both passengers and freight. The commuter railway service will also be needed along with the development of universities across Purwokerto from 2021 to 2031. The development of universities across Purwokerto will potentially increase the students.

Regarding the structuring and development of micro-industries in SDAs III and VII, as a part of the industry development program in Purwokerto, the city will then need better freight transportation. Hence, there will be the development of the railway connecting Cilacap-Purwokerto-Tegal to support industry development from 2017 to 2021. Cilacap and Tegal are industrial and also seaport cities in the southern Java and northern Java, respectively. Good intercity connectivity between industrial areas and regional activity centre will then support the development of local and regional economic centres in Purwokerto from 2020 to 2024.

The increasing numbers of train trips will then require better infrastructure. The development of double-tracked railway connecting the intercity route Cirebon-Purwokerto-Kroya-Solo will continue in 2015 to 2024. This development is essential to increase capacity on the intercity railway transport service and support the national transport development scenario in increasing mass transport (Kementerian Perhubungan, 2005).

Furthermore, the number of students from outside Purwokerto is expected to grow and will also raise the needs for housing in SDAs near the location where the universities are located. Moreover, the increasing population along with the development of better transport provision will also affect housing demands. Addressing the enlargement of the built-up area, the government is likely to construct and develop vertical housing in all SDA areas except the CBD from 2025 to 2034.

9.5. Sociology perspective

9.5.1. Selecting future events

The past narrative development taken from a particular sociology perspective in chapter six introduced the sub-criteria of (1) regional perspective, (2) transport drives growth of the city, (3) urban planning play a role in city growth, (4) institution and (5) government policies and (6) human capital, (7) developing country, (8) population and (9) life quality, (10) transport infrastructure provision, and (11) geographic position. The group of events presented in Table 9.7 is selected against the sub-criteria explained previously.

Table 9.7 A group of events from a sociologist perspective (picked from table 8.7.)

No. in Table 8.7.	Events	Expected implementation year
1	Purwokerto will act as a regional activity centre for its function as a centre of public service and transport hub for road and railway transport	7.3.1.
2	The economic structure will be formed by service, transport and communication, construction, and the industry as the big four of economic sectors	7.3.2
5	Improvement of intra-city transport infrastructure	7.3.2
6	Development of the regional railway	7.3.3
7	Development of commuter train service Purwokerto-Slawi	2016-2020
8	Development of the commuter train service Purwokerto-Kutoarjo	2016-2020
9	Development of cooperation between regencies within Central Java Province through a complementary relationship	2015-2019
10	Enhancement and development road infrastructure connecting West Java – Purwokerto – Banyumas – Wonosobo - Secang	2015-2024
11	Development of Purwokerto level A bus station	2016-2020
12	Development of double-tracked railway for the intercity route Cirebon – Purwokerto – Kroya – Solo	2015-2024
13	Improving human quality by increasing quality of education, religion and technology	2015-2019
14	Strengthening people participation and empowerment in development	2015-2019
16	Development of university facilities within Purwokerto area	2021 – 2031

No. in Table 8.7.	Events	Expected implementation year
17	Population distribution arrangement	2016-2020
18	Poverty alleviation through the neighbourhood development program	2016-2020
19	Development of local and regional economic centres	2020-2024
20	Compulsory basic 12 years of education	2020-2024
21	Reactivation of commuter railway track serving Purwokerto-Purbalingga-Wonosobo	2025-2034
22	Development of Cilacap-Purwokerto-Tegal railway to support industry development	2017-2021
23	Construction of intra-city public transport station in northern Purwokerto	2014-2018
24	Structuring and development of micro- industries in sub-development area III and VII	2014-2018
25	Development of vertical housing in all sub-development areas except the CBD	2025-2034
26	Enhancement of intra-city road capacity	2019-2024
27	Widening internet coverage and its service for the entire Purwokerto area	2020-2029

9.5.2. Future timeline diagram

The future timeline diagram created in this section uses the evidence presented in Table 9.7. The assumed future evidence is set out in a bar diagram in chronological time presented in Figure 9.7.

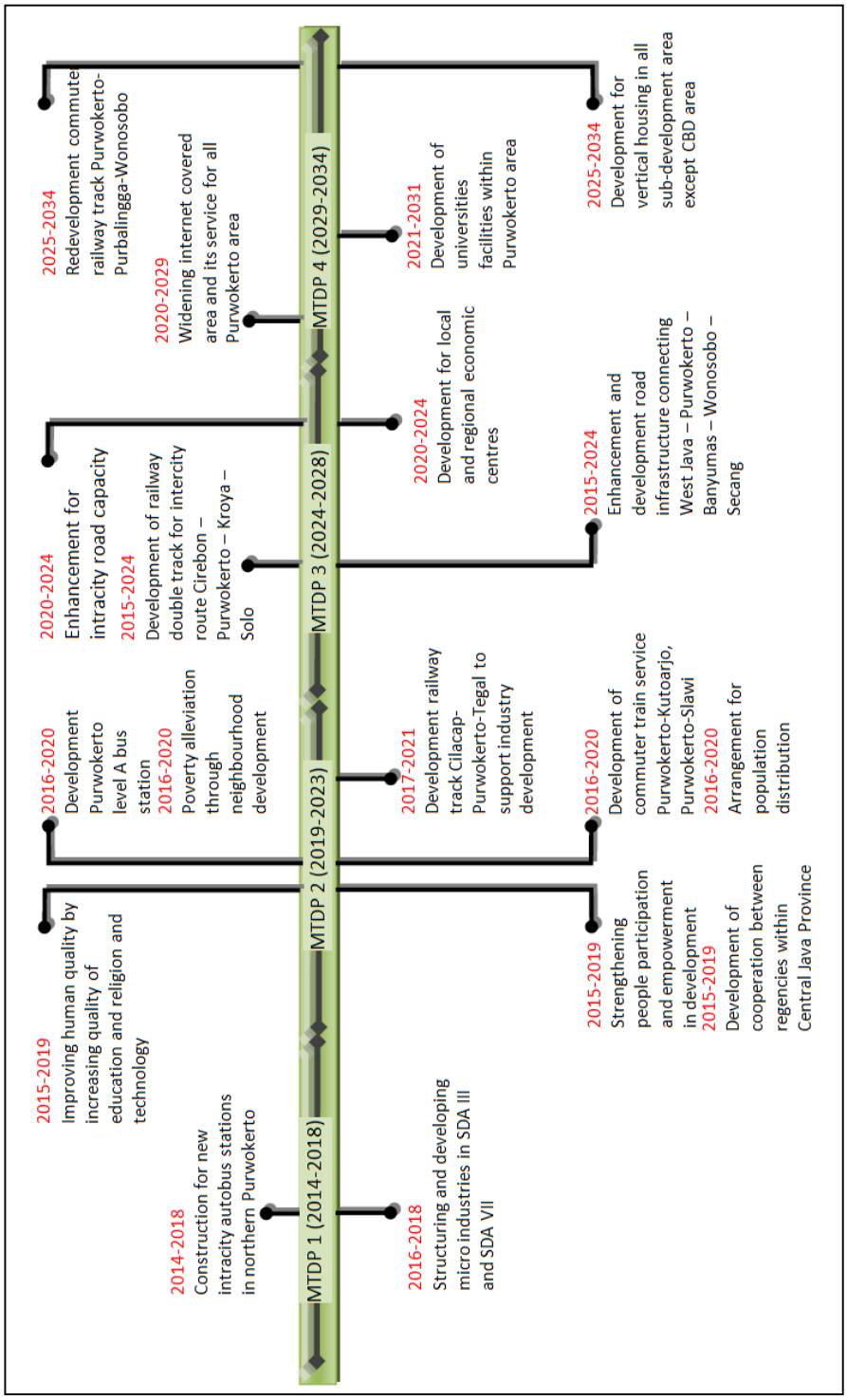

Figure 9.7 Future timeline diagram for Purwokerto case study from a sociology perspective

9.5.3. Future event sequence diagram

The future event sequence diagram presented in Figure 9.8. demonstrates the causal-chronological events in the future development of Purwokerto. This diagram is created with respect to the causal loop diagram in Figure 7.15 in order to define the causal relationship between events.

Meanwhile, Table 9.8. presents an academic judgement of future evidence with respect to some concerned sub-criteria.

Table 9.8 Interpretation for future events from a sociologist perspective

No	General information of Purwokerto from Table 7.5.	Criteria	Sub-criteria	Future event	Additional comment
1	Purwokerto is set as a centre of government, economic, education, and public services for Southwest Central Java region. Therefore, Purwokerto attracts people to come for related reasons.	Spatial perspective	Regional perspective (A3)	• Purwokerto will be set as a regional activity centre for its function as a centre of public service and transport hub for road and railway transport • Development of cooperation between regencies within Central Java Province through a complimentary relationship	Purwokerto development seems placed as a part of regional development. Therefore, Purwokerto will have more opportunities in experiencing knowledge transfer through the wider interaction constructed.
2	Purwokerto is a hub transport in south west of Central Java Province region. Two different modes have made Purwokerto as transit node as well: train and road transport. Historically, Purwokerto started to grow faster when transport infrastructure was constructed.	The role of transport	Transports drives growth of the city (B1)	• Enhancement and development road infrastructure connecting West Java – Purwokerto – Banyumas – Wonosobo – Secang • Development of Cilacap-Purwokerto-Tegal railway to support industry development • Construction of intra-city public transport station in northern Purwokerto	The existence of transport in Purwokerto will potentially lead this city and its surrounding to have better connection in both road and railway. The transport service will also facilitate increasing interaction toward knowledge transfer between entire areas in its service.
3	There is a transforming economic activities in Purwokerto since it became a capital of Banyumas regency. Primary economic activities have shifted		Quality life (G2)	• Improving human quality by increasing quality of education, religion and technology • Development of university facilities within Purwokerto area • Compulsory basic 12 years education	Education facilities provision can potentially play important role in increasing quality life with respect to education level. Furthermore, the presence of university also could bring economic activities that in turn

No	General information of Purwokerto from Table 7.5.	Criteria	Sub-criteria	Future event	Additional comment
	into tertiary ones. The changing main activities affect the socio-economy of Purwokerto inhabitants' livelihood.				can increase per capita income as it already happened.
4	Construction of transport infrastructures connect some different places and boost relationship between people. Road constructions link between activities centres and also from former city centre with new sub centres.	Transport provision	Transport infrastructure provision (H2)	• Development of double-tracked railway for the intercity route Cirebon – Purwokerto – Kroya – Solo • Development of Cilacap-Purwokerto-Tegal railway to support industry development • Enhancement of intra-city road capacity	The presence of transport infrastructure will make the Purwokerto connection wider and easier. A greater number of people come to Purwokerto for certain reasons.

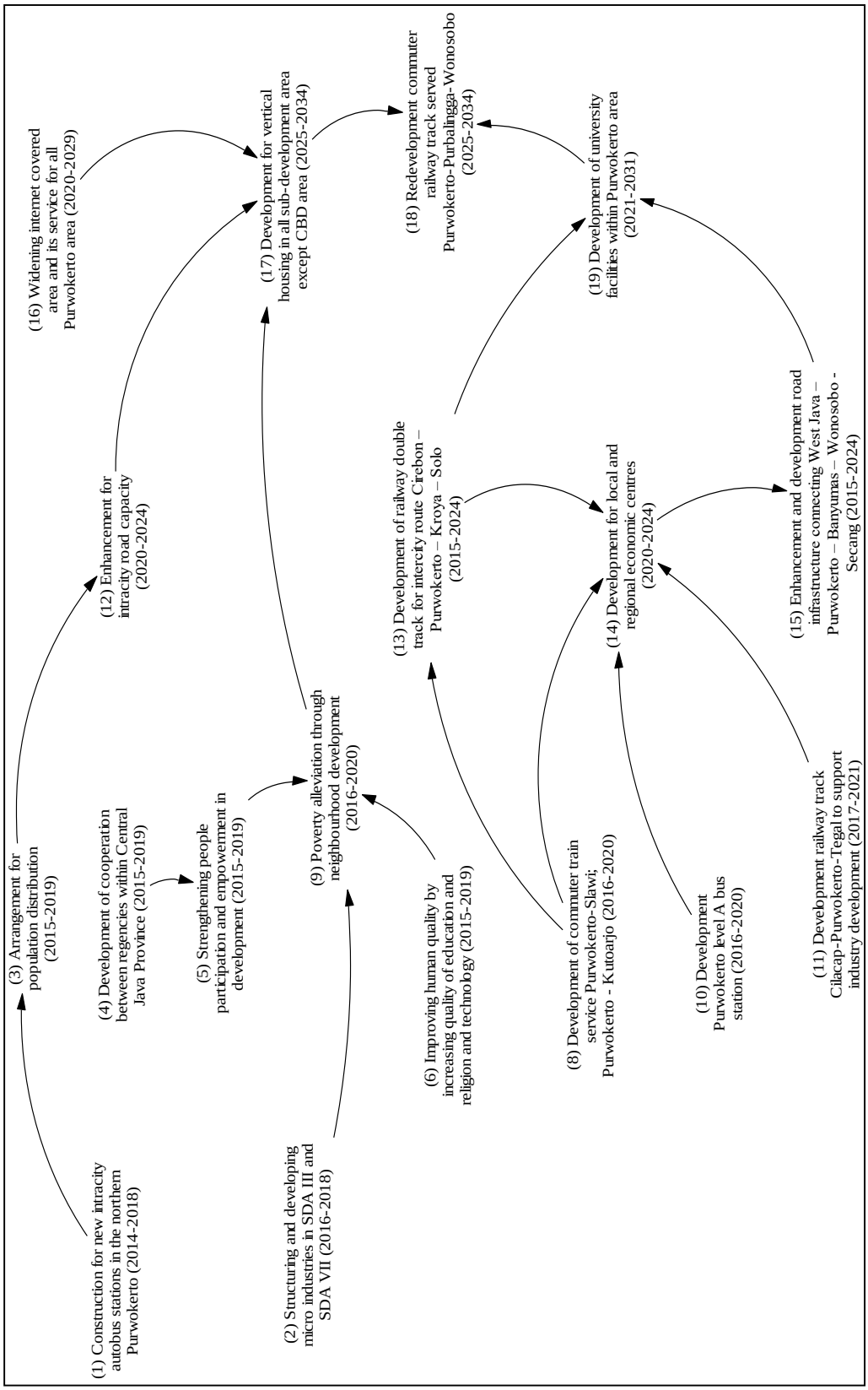

Figure 9.8 Future event diagram for Purwokerto from a sociologist perspective

9.5.4. Future narrative of transport and land use development from a particular sociology perspective

The number of people movements will potentially grow as the population increases. It is because people naturally need to interact with others. The higher the growth of the population, the greater the needs of networks between people. Accordingly, the construction of a new autobus station in Northern Purwokerto in 2014-2018 might be able to accommodate the need for relationships between the people of Purwokerto. Furthermore, the presence of an autobus station may potentially generate economic activities due to the multiplier effect in the surrounding station area. Additionally, the existence of economic activities will influence the socio-economic condition for those taking part in the activities.

A new autobus station in northern Purwokerto will support arrangements for population distribution across the entire Purwokerto area which may be undertaken in 2015-2019. Population density will be distributed to all sub-development areas, except the CBD. The social community will then be expected to develop for this population distribution effect. The increasing population will be supported with the improvement of the intra-city road capacity in 2020 to 2024 in order to ease movement and accessibility between places. Easier mobility and improved links between areas would be presumed to influence community development as it will generate a dynamic relationship both between and amongst communities.

Other future evidence points to the structuring and development of micro-industries in sub-development areas III and VII that will be undergone in 2016-2018. It will form a central micro-industrial area potentially attracting people to job opportunities and trading activities. Therefore, these micro-industrial centres are likely to play a role in the poverty alleviation program conducted between 2016-2020, together with improving the quality of human resources, and strengthening people participation and empowerment in development in 2015-2019. The strengthening of people participation and empowerment in development will be a government program to improve city environmental conditions. Improving human quality in 2015 to 2019 then correlates with evidence number (9), which is mentioned in Figure 9.8.

9.6. Interdiscdisciplinarity next step in developing city development narrative

This thesis is constructed by a multidisciplinary approach that addresses 7 disciplines. As it is pictured in figure 1.1., different basic concepts from various disciplines are discussed and presented. It brings different narratives that consider multiple methodologies and assumptions. This is done to urge people to understand many perspectives in seeing the growth of the city. Approaching the city growth from multiple disciplines is also seen as a helpful way to illuminate the complex phenomena in the growth of the city process.

In developing the future narrative of city development, different scenarios can also be built for a particular city. Utilising the same city planning documents, various future development scenarios are delivered. It is created by following different logical thinking and main development variables. Those are future narratives that have their own stories in describing how a city develop in the time might yet to come.

Regarding the interdisciplinary approach, in practice, this idea might be conducted by doing a workshop considering consensus-building method. It happens when practitioners from different fields work together to decide an appropriate decision to solve the problems. The workshop gathers different people from multiple perspectives to discuss complex issues. Complex issues are those that include multiple perspectives and many possible solutions. Thus, there will be many points of view in seeing the issue that potentially difficult to understand to others. Here, causal loop diagrams can be used to explaining logical thinking from each perspective. It is assumed as an ease way to make people understand. Further, a discourse of the discussed issue is carried on to attempt the final decision that expectedly becomes the best decision came from perspectives synthesis.

9.7. Conclusion

This thesis basically aims to simplify the complicated dynamic growth of the city, both in the past and in the future and describing it in narratives. The multidisciplinary approach used in this thesis leads to a varied understanding of city growth. Hence, future development of the city that is the essence of city planning could likely be pictured in different points of view.

Several legal-planning documents are used to predict future events as basic information to create future narratives. Even though this future information is likely to be the most appropriate sources for the narratives, the future is yet to come. The future intended here is assumed to follow a trajectory that has been given in the planning documents.

City planning documents are devised to be applied in a particular area regarding the area's conditions and characteristics. Therefore it is appropriate to its area. However, as the city's factors cover many different variables the plan cannot totally be applied. Resulting from spatial planning implementation experiences, many city authorities are discovering unsuccessful implementations of planning documents. The great influencing factor might refer to the economic sectors. Pushing economic growth activity affects space provision, infrastructures, and other supporting elements. Resulting from this, land-use change becomes a major issue. To cope with this problem the city planning documents need to always be reviewed at a certain period. In Indonesia planning regulation, spatial planning documents should be evaluated regarding dynamic city development and strategic environment issue within the fifth year of its implementation (Ministry of Justice and Human Rights of the Republic of Indonesia, 2017). However, the future narratives resulting from this method can be used to understand how the future city is likely to be.

In conducting the future narratives, this step has considered the past developments of the city. However, the different conditions between the past and future are possible to appear regarding some influencing factors: e.g. technology and development direction. Therefore it will still be possible to find a condition of the future narratives different from what it is expected from the past narratives.

Chapter 10
Conclusion: Towards a Systematic Methodology in Creating Future Narratives for City Growth using Different Disciplinary Perspectives

10.1. Introduction

A big system like a city is likely easier to be understood using a causal thinking approach. This is because as a huge entity, a city contains many different elements that link one to another base on a cause-effect relationship. Different views in defining city meaning are also broadly triggered by complex factors and events involved in the city development process. As it has numerous involved elements in its development process city development can be discussed from different discipline backgrounds. In this regard, city discourse commonly has its point of view considering a particular perspective that in fact usually neglects some factors coming from other disciplines. The knowledge of different ways of thinking from different disciplines in seeing how a city grow is considered to be able to facilitate an understanding of the overall development of the city.

Because of this complexity, it will be easier to understand long term growth of the city using a narrative approach, for it discovers an experience of city development from years ago and later on. In this regard, it is a challenge how to develop a systematic ordered approach to create a city development story from different disciplinary backgrounds. This thesis answers this question by giving some steps undertaken in orderly fashion. As presented in chapter four, it is useful to first deeply understand the different points of view of different disciplines in seeing the growth of the city. Some other approaches, also mentioned in chapter four, are needed in an attempt to answer the research question. Here, some logical steps result from the synthesis of different points of view. The basic thinking used in this point was a system of thinking as described in chapter two. Nine variables are considered to be used to build different causal relationship diagrams with respect to varied discipline backgrounds. From these points a different narrative of city developments using past data and a bunch of evidence can be created.

Another question, as mentioned in chapter one, is whether there is any different pattern of development of the city in the past and the future. In this regard, chapter seven found that causal relationship pattern amongst essential city development variables in the past can likely be applied in the future development of the city. This also answers the possibility of the continuous growth process of a city from time to time, from the past to the future. However, there is a problem in creating a future narrative regarding data and evidence from where a past narrative is created. The data and evidence for future development use an assumption that there is an intended condition formulated by city planning and policies.

Respecting the different perspectives in understanding the city growth, this research as mentioned in the first chapter aims to develop a methodology to create growth of the city narratives from different disciplinary perspectives. Using a multidisciplinary approach, this thesis synthesises and harmonises the city growth field between seven disciplines into a coordinated and coherent unity. A systematic methodology, which can be used for different disciplines, was then created in chapter three of this thesis. The following chapters (chapter four to nine) presented how the methodology settled in a real-world Indonesia city, Purwokerto. Past and future narratives of Purwokerto city development have been produced following some steps in methodology created in chapter three. Those narratives are presented from some different discipline backgrounds that showed how different perspectives lead to different narratives of a particular city. In essence, the method created in this thesis can be generically applied to other cities that have rapid growth considering the set of sub-criteria represented in the classification table

10.2. Reflection on the contribution to knowledge

The original contribution of this thesis to knowledge is a proposed methodology to understand the development of the city with a multidisciplinary approach. The created methodology allows incorporating both quantitative and qualitative data when defining the future of the city considering its past development. The provision of quantitative data is one of several challenges faced by city development researchers especially to researchers in developing countries. Moreover, it also offers varied disciplinary perspectives in creating stories of the city, in the past and for the future. Also, it offers a way to address the quantitative data provision challenge that is usually faced in city development research in developing countries, which can be minimised using other data and information resources.

10.3. Reflection on steps completed in this research

This research was conducted following logical thinking which was represented by the number of steps depicted by the methodology diagram presented in Chapter Three. The created methodology is a fundamental diagram that leads to how city development narratives are built-in chapter seven and nine of this thesis. Following systematic and logical steps in the diagram the rest chapters, four to nine, were then written. Chapter three is important because there are several principles steps which need to be undertaken, e.g.:

Selecting varied theories from different disciplinary perspectives

Several disciplines relate to the different factors in the growth of the city process. In this thesis, as mentioned in section 3.3.1.1. some disciplines concerned with the city growth field were taken into account. By incorporating the discussion regarding the growth of the city from Glaeser et al. (1992), Wilson (1998) and Beall et all (2009), 7 different disciplinary backgrounds were considered, namely: (1) transport studies, (2) economy, (3) geography, (4) economic geography, (5) urban planning, (6) history, and (7) sociology. These disciplines were likely the disciplines that are most intensively concerned with the city growth topic. The first two parts of chapter four discuss those seven disciplines briefly and explainhow each discipline has its perspectives of city growth factors and process.

City growth, however, as mentioned in several parts of this thesis was understood to be a dynamic and complicated topic. It was also obvious that there were some aspects which could be concerned as different points of views. Therefore, although this thesis has already thought of varied different perspectives that were concerned with city growth field, there are still possibilities in the future that the topic could possibly be covered by other discipline fields.

However, it would be another challenge for having other disciplines involved. Having them to be involved in the study would likely need a deliberate attempt to incorporate. This is because the framework is formed by synthesising various knowledge and information from those disciplines concerning this topic.

Determining the classification framework of different disciplines

This step was one of the more complicated and challenging works in this present thesis

since it was used to develop a framework to accommodate different disciplinary views in the city growth discussion. The classification framework was set up as a table which was populated by paper examples in an attempt to understand differences, since they functioned as tools to populate different perspectives in defining the city growth.

The other part of chapter four describe how this research accommodated nine criteria which were included in an interdisciplinary study from seven selected disciplines in this research. Section 3.3.1.2. explains two groups of criteria that were distinguished into disciplinary views and subject matters. The group of disciplinary views referred to certain criteria that accommodated the understanding of city growth from nine discipline areas. The second group dealt with the subject matter to determine city growth regarding real city conditions. However, in choosing and separating criteria regarding the knowledge area and the real world was not an easy task since there were numbers of criteria with different contexts in determining the city growth. Each discipline had its criteria and perspectives to determine the growth of the city.

Further, the criteria and sub-criteria were captured from synthesising different perspectives which were concerned with the city growth field. Therefore, it might be possible to neglect some particular aspects. However, the criteria were devised by considering both physical and non-physical aspects of city growth. This was expected to cover subject matters and empirical consideration in understanding the growth of the cities.

In particular, for the process of determining the criteria, it might be easier to do it more systematically. This could be done by listing the various criteria referred to by different disciplines using a grouping table.

Selecting papers in different disciplinary perspectives

There were countless journal papers concerning the growth of the city from different disciplinary perspectives published in varied journals. This research took a number of articles to populate in the table of classification. The chosen articles were taken considering the impact factor they have. Basically, this concept is applied to make this selection process easier as it is measurable. However, this might exclude a potential or a good article with no impact factor to be selected subjectively.

This step is presented in chapter five. This chapter, therefore, is important as it shows how different discipline have different perspectives considering development factors in the growth of the city. Here, different papers were taken to a deliberate

understanding of how city growth could thoroughly be understood. It was nearly impossible to have all journal papers from different perspectives and populate them into the classification table. The step of selecting many journal papers sample to be involved, however, represented the logical thinking of each perspective. Additionally, another research study using this methodology could perceive other journal papers to be populated since different perspectives within a specific discipline normally used a similar framework.

Fitting in the framework with some paper examples

This step involved choosing relevant events in the paper examples using the sub-criteria as explained in section 3.3.1.4 Each event was judged regarding the interpretation of sub-criteria in the previous process. Therefore, this process is not simple since each selection process needed to consider the referred discipline perspective. The complicated process is proven in doing this process as shown in chapter five. However, this process might become biased as there is a subjectivity of the researcher in defining the subcriteria that a particular event belongs to. Therefore this process need to incorporate circumspection

Set of possible approaches for a particular discipline

Creating a set of possible approaches is a stage to facilitate the next step of creating a narrative of city growth. Here some possible subcriteria combination is provided to assist an appropriate set of subcriteria-combination of a particular city.

Justification and choosing the case study city

A case study is used to apply the created methodology into a real city to see how the methodology works. Chapter six present how the case study city is chosen. This research used the 2nd hierarchy of Indonesian city considering the current development policy in Indonesia. It would be better if this research could use three different types of city to represent Indonesian city types in a research paper to identify different types of cities in analysing their growth. But being realistic with the thesis limitations, the research took the most interesting case study in Indonesian cities. The case study city was an interesting city to be discussed due to its position between the first and third city level as presented in chapter six. However, people later could use this research method to be applied to other types of city.

Available past data/evidence

As mentioned in section 3.3.2.5., basically past data evidence is a historical data of the city that informed city development over time. The data contained varied information from different sources. Therefore, different resources sometimes marked the different exact times for similar data. In this research, this issue was managed by comparing the different data and considering relevant and appropriate information.

The implementation of this method to a city with a well-managed historical data record and information, therefore, would be easier. It is because this method uses past data evidence as one main consideration to define the future of the city. However, the lack of data, especially the past data and evidence, as is commonly the case in developing countries, becomes a big challenge in this step. This situation, as arose done in this thesis, can be coped with by considering some historical texts related to the case study city.

Selecting a research approach

An approach was taken from the available set of combination sub-criteria created from the populated table of classification. Written in section 3.3.27, the selected approach was a set of combination sub-criteria that were likely relevant to the case study city. Alternatively, any approach could be selected by referring to the logic to create the narratives of the growing city.

Constructing causal loop diagrams

As described in section 3.3.2.8, a causal loop diagram depicts the causal relationship between variables under a discipline perspective. Even though in each causal loop diagram the logical thinking followed a specific discipline, the representing variables were taken from the appearance events presented in some papers examples. This approach was conducted to follow an easier way of representing events as variables. It was learnt from chapter six that applied this step using Purwokerto as case study city, using high-up variable names would probably improve the research.

Constructing past event sequence diagrams

In creating a past event sequence diagram, as was done in chapter six, there was a judgement step to define the relevant evidence related to the specific sub-criteria. Later, every single event would represent one sub-criterion. This was completed to determine a suitable causal relationship following the relationship between two

variables in the causal loop diagram. The chosen process might not exactly match, but it could be reduced by double-checking the time occurrences.

Providing future data/evidence for each discipline: disciplinary views and subject matter

Evidence for the future development of the case study city was fulfilled by the number of development plans concerned with this particular city on some different planning scales: national, regional and local. Using legal plans as evidence would not provide the precise time of planning implementation since the implementation time of each plan was possible to change. However, it was the best way to assume future development of the city from government direction. Moreover, the implementation year of plans sometimes was different between planning document. This data and information are presented in chapter eight. Not only describing the related policies that determine the future of the case study city, chapter eight also presents the process of choosing the selected policies itself. This research, in this regards, is concerned with the lowest scale of development planning. Another challenge regarding this step was a number of different conflicting future events sometimes shown by city planning documents. Here, the contradictions amongst those plans made this step complicated.

On the other hand, regarding city planning, there were some city practitioners who were experienced in the city development process. Their experiences related to everyday urban lives. Respecting future evidence, it might be good to involve city practitioners in this process concerning future-city trajectories. However, the development of the future narrative in this thesis relied on real-written city plans. Therefore, involving city practitioners in a discussion about the future of the city might lead to a more complicated process regarding the justification of the future evidence step.

Constructing future event sequence diagrams

This process was conducted following a similar method in creating the past event sequence diagram. However, it was found that the approach, with respect to the sub-criteria, could possibly fit with past conditions, but was not appropriate with the current and possible future conditions due to the existence of some factors: e.g. the changing of development direction. Therefore, in creating future narratives, comprehensive future trends concerning a case study city should be noted in order to explain the changes in the development pattern. This whole process including the

future narratives of case study city was described in chapter nine.

Moreover, the judging process in defining the relevant event that represents a particular sub-criteria might not exactly fit. However, it still could be used to explain what would potentially happen in the future.

Future narratives of transport and land use development

In the creation of future narrative for the city growth, there was no evidence for the future. Using plans of the city as was done in chapter nine was one alternative to deal with the evidence issues. However, since the evidence substitution was likely to have not been done yet, the development of narratives could become uncertain.

The created methodology has been applied to Purwokerto as the case study city. This city is an Indonesian medium size one and this type of Indonesian city has a typical rapid growth level in many aspects e.g. activities, population, social, etc. From this research, it can be learnt that different perspectives give different future development path for a particular city. Authorities might take a benefit from the pictures of its city's future condition and choose the correspondingly appropriate development to be applied.

Moreover, since creating narratives considers that the occurrence of evidence will affect the occurrences of other evidence the development of the future narratives represents an awareness considering the discipline logical thinking.

10.4. Thesis contribution

10.4.1. Academic impact

This thesis emerges from a particular issue that transport researchers are usually trapped in their specific knowledge considering the city growth process. The analysis and thinking about how city development happens are laid on transport as a discipline. In contrast with the common understanding of city growth, this research proposed a multidisciplinary approach to be discussed in this topic. Hence, this thesis provided a significant contribution to multidisciplinarity by encouraging people, particularly with respect to transport; to conceive different disciplinary perspectives. It also pushed transport studies people to think more about using multidisciplinarity approach through learning other people disciplines. It is because there is a great

number of disciplines dealing with the given topic. By using a multidisciplinarity study, a different perspective can be converged regarding the topic given. Furthermore, city growth can be seen using a varied discourse from many different views.

Further, this thesis, as mentioned in the first chapter was expected to be used to give a variety of understandings on the city growth topic. Academically, it is now expected that this study could provide a wider knowledge regarding the city growth field, particularly concerning land use and transport development. City authorities may also take advantage of different thoughts in city development. In practice, city stakeholders including city authorities, city planners, as well as academics could have a discussion to define different stories of their city. This includes how they can be aware of the causal relationship between different city elements in the future-city development process. Here, as mentioned by Hull (2007) in chapter two, the technical process is done by bringing together experts with different expertise to discuss the possible links between different disciplinary perspectives. Also, they might consider their understanding of future cities attained from the future narrative in city planning documents by conducting a discussion attended by all the corresponding city planning stakeholders.

The results of this thesis are discussed in the following text. Growth of the city involves numerous variables. This is because a city consists of many factors that relate to each other and create then a whole city system. In this regard, the city is likely formed in a complex way. Regarding city development variables, the relationship amongst variables in the city growth process is not a simple thing. The relationship is complicated and dynamic as each variable always change all the time. As there is a dynamic pattern the emerging relationships amongst variables are complex interactions too with a feedback mechanism. Changing an internal city's system influences how the system behaves in the future. Dealing with this condition, telling how a city develops will be far from reality if it is approached by linear thinking. Linear thinking as a of problem-solving strategy leads to placing everything in a static situation so that time is a dependent variable.

A complex interaction in a system can be understood by a system dynamic approach. System dynamics approach investigates, thereby, the complex interactions amongst important variables by tracking how they affect one another over time. Considering

the system dynamics can also lead to understanding of how to break a complex problem into its components in order to get a better understanding. Moreover, there is a feedback step in system dynamic and system analysis that can control the process. This means there is a reaction when an action is done. The feedback concept can be accepted then in city system-variables interactions. A comprehensive model can be built to depict how the involved factors affect each other. In this regard, the causal loop diagram (CLD) represents a system dynamic that can help to understand many dynamic factors in the city development process and also simplifies a complex world into a diagram.

Thus, a particular CLD has its concept, circular connection, and cause of a reaction (feedback) and given the varied different points of view held by numerous experts in the city development discussion the discussion will be complicated. The causal loop diagrams (CLDs) of different disciplines as presented in chapter six of this thesis can be used to provide an easier understanding of how the city develops, especially in a causative relationship of the main-variables. Different CLDs show that there are different patterns in the causative relationship amongst city development variables. In this respect how each variable relates to one another represents the point of view used in the CLD. CLD is built from a system dynamic pattern. In CLD, the loop is built as a closed loop. Closed-loop thinking leads people to engage with the complex and reciprocal relationship amongst variables within a system. Therefore, the CLDs used in this research represent how variable influence one other.

10.4.2. The research impact possible use by policymakers and practitioners

As it is pointed out previously in this thesis, growth of the city can be understood from different perspectives. Different perspectives mean there is a varied point of view in seeing how the city grows. Here, there are different factors and processes in growth following each perspective. Thus, there are also different complicated process to be assumed in order to understand the growth of the city from varied perspectives.

Resulting from this research, the city authority is helped by understanding how a number of city development main-variables are linked in a causative relationship. Also, building on the ideas in Spector et al. (2001), the CLD (that represents a system dynamic), helps the city authority to understand many dynamic factors in city

development and formulate robust policies across different disciplines. Spector elaborated the Sterman idea (2001) that is concerned with complex systems. A city then is referred to as a complex system with different involved factors within its growth and development. Those factors have internal relationships and feedback mechanisms. The change in internal city system leads to how the system behaves in the future.

Further, in deciding the city development policies, the authority then might engage an interdisciplinary approach. Referring to Ramadier (2004) and Chorley (1967) in chapter four, an interdisciplinary approach perceived and considered some different concepts from varied disciplines to complement a coordinated and coherent decision. This is because an interdisciplinary perspective synthesises and harmonises various point of views. This process take into account the consensus-building method as mentioned in chapter two.

In Indonesia, a determining policy process is seen as a difficult step as it engages different interests. One of the many considerations that need to be concerned, however, is how the policy can be easily implemented. Here, formulating the policy is understood as a political process that engages city stakeholders (Ramdhani et al., 2017). However, there was a community planning project that urged people in their community to develop their area planning considering the participatory approach. This process is undertaken to develop agreements of their intended community in the future. Moreover, by the participatory community planning, there are community policies that are also built by the community agreement (Saragih, 2011).

10.4.3. Policy impact for the sustainable development

The policy impact here is how this proposed methodology can lead to sustainable development. City authorities needs to decide city development policies considering different disciplinary perspectives. It is a hard process that needs to be done considering different concentrations in the city growth process. An alternative solution to cope with this is by doing consensus-building. Mentioned in chapter two concerning the research finding of Innes (1996), consensus building can be interpreted as a coordination technique that facilitates a discussion to produce decisions that consider different perspectives. Doing consensus-building, different groups with different points of view can together develop agreements that satisfy everyone’s main concern.

This is because the consensus-building approach forges people to firstly understand other people's points of view and discuss them to decide whatever policies are suitable for the community as referred from Susskind (1999). Through a consensus-building, a consensus is developed over complex matters. In Innes, the way to understand each perspective is by doing in-depth interviews with participant, reviews, and reading documents. It is done to comprehend the basic concepts of each perspective or opinions regarding involved variables and process. They then compare varied opinions and points of view to get both the similarities and differences in details. In this point, some small groups are built representing varied perspectives led by an expert in a specific discipline. Thus, following research finding of Susskind (1996) referred to in chapter two, a decision result from a consensus-building approach will be different from other approaches e.g. top-down approach or decision from majority voice. The decision might be easier to implement in the real world, as it is an agreement amongst different fields.

Referring to the thesis, in synthesising varied perspectives, CLDs are used to help in an early step of consensus building when people (city authorities) should understand different points of view on how a city can be developed in the future. Here city development policies, which usually come over the city planning documents, should comprehensively cover the whole range of city elements. City as mentioned in earlier chapters, consists of physical and non-physical elements. Hence, city development policies should also take into account both city elements. However, considering an economic development for example, sometimes the growth of the city emphasises how this sector is pushed to get high economic growth. Understanding different points of view on how the city develops in the future can potentially put focus not only on economic growth, for example, so that the development elements of the city can keep sustaining.

10.5. Reflection on positionality of the researcher

Doing single research using multiple perspectives potentially generates subjectivity. It is because researcher's disciplinary background will potentially influence the work. Some reflection on this are:

- Creating a methodology diagram step was a big challenge. It is because the

development process of the methodology needs to work in parallel with the creating of narratives that consider the real city condition written in chapter seven and nine. Each step needed to be iterated with empirical data and evidence. Need to revise more than a hundred of time to build a methodology diagram until it became applicable to the real city's data and evidence.

Considering seven disciplinary perspectives was also not a simple task, especially as this work is written by a single researcher from a particular disciplinary background. In my case, I have an urban planning background. I needed to think critically from many different angles considering multiple perspectives. Here, this work is potentially influenced by my disciplinary background. Other authors might emphasise differently. From my experience, knowing the defined elements of each discipline perspective is a must in doing so.

Journal papers were the data for chapter five when many papers were used to populate the different classification tables. In this process, a large degree of effort was made. This is because I needed to firstly group paper examples into a specific discipline this was sometimes not easy. A single paper might contain varied disciplines. A single paper might also have a slightly different disciplinary background compared to the journal where it was published. Therefore, those papers needed to be carefully placed into suitable classification regarding the respective journal’s field.

Moreover, it was hard to populate many papers into classification table with nine sub-criteria for each paper example. Most papers did not explicitly express those sub-criteria in their texts. A paper, therefore, has to be clearly understood to find the keywords related to the sub-criteria. This was achieved by repeatedly reading a paper considering their point of view. In this process, a different researcher from another perspective possibly thinks differently in populating the journal papers into the classification table in chapter four.

Moreover, the discipline background of a researcher might make the narratives biased as this research concern with multidisciplinary perspectives. My urban planning background, in this regard, also potentially drives unfair discussion. However, this thesis is written in a fair way respecting those different disciplines to introduce the multiple narratives that can be created for both the past and future condition.

As mentioned previously in chapter three, both narratives for the past and the

future are created following the methodology diagram presented in chapter three. The biggest challenge for me was creating narrative city development from the historian perspective. It was uncomfortable as I needed to knit the past sequence events into a full development story. Working from historian's perspective also necessitated the collection of supporting information that shaped the past events. This information covered political, social, technology, and intellectual conditions. Even though an urban planner also works with past data and evidence, I feel comfortable working from this perspective as it is my background.

- This thesis is concerned with multiple disciplines and keep them separate. By this, people are expected to consider multiple perspectives in predicting the future. Working with varied perspectives likely needs to go beyond those points of view to capture the essential perspective that can be synthesised into a new discipline. However, it also can be combined utilising the framework created in chapter 4 in this thesis. A big challenge in doing interdisciplinary thinking is in carefully finding the weaknesses and the strengths of each discipline and synthesising many perspectives into one new concept.

10.6. Suggestions for further research

This research conducted a study on a fascinating topic that will always dynamically growth. Therefore further research could potentially be conducted, such as:

- An adjustment method that can be applied in such settle cities that have less or un-rapid growth

  As this research is concerned with a city in a developing country, the assumptions and principles are laid on its characteristics. Here, it is obvious that developed country cities have different characteristic compared to those in developing countries. Assuming this, developed country cities would likely have more stable development, for example in population. Therefore the methodology would need to adapt to be undertaken for developed country cities.
- Moving toward this thesis, a particular way to do interdisciplinary thinking is by doing a workshop using the consensus-building approach as described in subsection 9.5. There are various research issues tied up with the idea of interdisciplinarity. Those include difficulties in organising people to join the

discussion, speaking in the same language amongst different perspectives, and also misunderstanding between participants. This can happen as each participant with different expertise will present their specialised knowledge that leads to more specific and technical explanations. Therefore, there is a possibility of agreeing or disagreeing with all participants. Here, the discussion might need supportive and interactive participants to make other participants coming from other fields to understand their way of thinking. Thus, a further research idea would be how to deal with these difficulties in taking an interdisciplinary approach. However, doing consensus-building does not guarantee the best outcome to resolve the problem. Nevertheless, this work gives the framework in thinking in interdisciplinary manner. A research question for further research might refer to how to do the consensus-building to construct city development policies.

- Referring to the proposed methodology, the diagram presented in chapter three in this thesis, some research questions arose, for examples (1) how to work with interdisciplinary in creating past and future city development narrative, (2) how to build megacity development narratives, (3) as a megacity is a super complex in its development, how to predict when their development will stop, (4) applying the proposed methodology to different types of city is there any different variables that determine whether growth is slow or fast, (5) considering that the city grows simultaneously with other cities in a particular area, how does this condition affects each of the city.
- From this experience, people might consider different points of view in thinking about the future. The narratives would be different if they are written by a group of people with different disciplinary backgrounds. Therefore further research or work relating to this idea can be done to make it fairer in discussing each disciplinary perspectives. People from multiple disciplines work together with their perspective to create city development narratives in a thin multidisciplinary approach. This work can be followed by combining new narrative regarding the interdisciplinary approach.
- A quantitative discourse could be built based on the framework created in this thesis. In this regard, some disciplines deal with the qualitative method whilst some take a quantitative approach. Therefore, further research could be developed to a corporate both qualitative and quantitative methods.

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Appendix A
Administrative area division in Indonesia

In order to understand the context of Indonesia in this thesis, this appendix gives a brief description about administrative division in Indonesia. Definition given in this appendix are based on Law No. 23/2014 for Regional Government. The Indonesian word will be given in cases where there exist no suitable translation in English.

Administrative area is a working area for central government institutions including governor as the representation of central government for governmental affairs held under the authority of the central government in work areas of governors and regents/mayors.

- Province

  Province is an administrative region and as the working area for governor as a representative of the central government. Indonesia is currently divided into 34 provinces.
- Regency/city

  A province is subdivided into smaller administrative area. The two are administratively part of the province, but the difference is on their characteristic. A regency is an administratively part of province that has also rural characteristic. Whereas city has a mostly urban characteristic.
- Sub-district

  A sub-district is an administrative area as a part of regency/city area. The government leader for a sub-district is the sub-district head. The district leader is a regency or city institution for the district area.
- Village

  Village is the lowest level of government administrative area in Indonesia. There are two types of village that in the Indonesian language are called kelurahan and desa. The difference between them deals with governing systems. Kelurahan is an administrative area under sub-district government. Whilst desa, is a unity of the legal community who has authority to regulate and manage the interests of the local community based on the origin and the local customs.

Appendix B
Spatial planning specification in Indonesia

B.1. Spatial planning classification

The spatial plan classification basically refers to the planning area. Concerning the planning area, there are five classifications of spatial plan in Indonesia, i.e. based on system, based on major function area, based on administrative area, based on type of primary activity, and based on strategic-value area (source: Law No. 26/2007 for Spatial Planning; Sekretariat Negara Republik Indonesia, 2007).

- System

  Spatial plan is distinguished into regional system and internal urban system. Regional system is spatial structure and pattern with regional level outreach. Whilst internal city system is spatial structure and pattern with urban outreach.

- Major function area

  Major functions of area concerned with the spatial plan are classified into two: preserved area and development area. This classification considers the essential differences in characteristics between them. Preserved area is a particular area having a protective function for the resources. This major function area is a consideration in formulating spatial plans. Whilst development area is an area designed with a main function to be developed regarding its potencies in natural resources, human resources, and artificial resources.

- **A**dministrative area

  There are three classification of administration areas: (1) national, (2) province, and (3) regency or city.

  (1) National spatial plan

  This is a government regulation about policy and direction for spatial development in national scale. National spatial plan contains (i) the objectives, policies and strategies of the national spatial planning (ii) national spatial structure plan, (iii) national spatial pattern plan, (iv) the establishment of national strategic area, (v) the direction of the use of space that contains an indication of program for main five-year mid-term development and (vi) control the direction of the national territory space use which contains an indication of the direction of the national

system zoning regulations. The national spatial plan 2008 – 2028 is referred to by all lower scale spatial planning and development programs.

(2) Province Spatial Plan

The Central Java spatial planning document is a reference document from where control and use of land in Central Java province refer from. This document contains policies and strategies regarding province spatial planning (Sekretariat Daerah Propinsi Jawa Tengah, 2010), including province spatial structure plan, province spatial pattern plan, the determining for strategic areas, provincial direction spatial use, and province spatial use direction control.

(3) Regencies/city spatial plan

Regency/city spatial plan is the provincial spatial plan amplification into regencies/cities policy and development strategy in accordance with their function and role in the province development plan. The regional development strategy is further implemented into structure plans and operation spatial pattern plan.

- Primary activity

  In regard to the primary activity, there are two kind of spatial plans: spatial urban plan and spatial rural plan. Urban area is an area with non-agricultural primary activities whilst rural area is an area having agricultural as its main activity. The boundary of these area commonly use either an administrative or functional boundary. The boundary is defined in the regulation.

  Purwokerto spatial plan 2014 – 2034 is a spatial urban plan. This document is a detailed plan of the Purwokerto spatial urban areas that comes with zoning regulations. Purwokerto in this regard is divided into 9 development area. The Purwokerto spatial planning contains detail development of each 9 development area for 20 years ahead from 2014 to 2034.

- Strategic area

  In compiling spatial plan for strategic area, there are three different strategic area:

  (1) National strategic area: A national strategic area is a particular area that is prioritised in spatial plan for its essential role in national scope.

  (2) Province strategic area: A province strategic area is a particular area that is prioritised for its essential role in provincial scope concerning economic, social, and culture.

  (3) Regency/city strategic area: is a particular area that is prioritised for its essential role in regency/city scope concerning economic, social, and culture.

B.2. Time Planning horizon

There are varied future plans for Indonesia development. In accordance with their planning scale, these plans are distinguished into three different scales, i.e. national, regional, and local. Whilst in term of planning horizon, there are long-term plan, mid-term, and short term for 20 years, 5 years, and 1 year respectively.

B.3. Development program document

The development program document is a document containing operational activities to implement the spatial plan in a particular area. Therefore the development planning document has three different type in accordance with the scale of planning, i.e. national development program, province development program, and regency/city development programs. Meanwhile, with reference to the time horizon development programs are divided into long-term development program, mid-term development program, and short term development program with 20 years, 5 years, and 1 year respectively for their time horizon. The compiling of development program document refers to a particular spatial planning and involves the stakeholders.

(1) On a national scale

a. Long-term National Development Program

b. Mid-term National Development Program

This document contains a national development strategy, public policy, programs of the ministries/institutions and cross-ministries/institution, regional and cross-regional, as well as macro-economic framework that includes an overall picture of the economy, including the direction of fiscal policy.

c. Short-term National Development Program

(2) On a provincial scale

a. Long-term Province Development Planning Programs

It is a development planning program document for a particular province which is derived from the purpose of establishing a specific Provincial Government. This document contains a vision, mission and future direction of regional development for the next 20 years covering a certain period. The Long-term Province Development Planning Programs is divided into four mid-term planning program. These mid-term planning programs are set every 5 years by government and stakeholders.

b. Mid-term Central Java Development Planning Programs

c. Short-term Central Java Development Planning Programs

(3) In regency/city scale

a. Long-term Central Java Development Planning Programs

Referring from Banyumas spatial planning, this document is used as development guidance for the whole of society's components regarding the vision and development direction.

b. Mid-term Central Java Development Planning Programs

c. Short-term Central Java Development Planning Programs

B.4. Other future documents

(1) Transportation planning document

There are three different transportation planning documents regarding the planning scale:

a. National transport plan

This document is an organised transportation guidance system for planning, development, and transport management in order to be able to realise the provision of effective and efficient transport services. This national transport system will be broken down into regional scale (regional level transportation system) and local scale (local level transportation system).

b. Central Java Province Level Transportation Planning

Transport planning documents on the other hand describe a guidance for transport development in a particular area in accordance with spatial planning.

c. Banyumas Local Level Transportation Planning

This documents is a guidance for transportation infrastructure development in Banyumas regency in order to acquire an integrated transport system in railway and as well as in road transport. It is also needed to deliver an organised transportation system atlocal level including railway and road transport system.

(2) Long-Term Plan of Transportation Ministry

This document is an indicative plan contains the direction for long-term transport development 2005-2025 used by the Transportation Department to carry out this department responsibilities in transportation development. It is used as reference for all work units within the Department for Transportation in the preparation of

Plans, Strategic Work Plan and Work Plan and Budget of Department for Transportation

(3) Masterplan for the Acceleration and Expansion of Indonesian Economic Development 2011-2025

This document is a roadmap for Indonesia development and an integral part of the national development planning system. It is structured as an attempt to transform the economy in order to boost economic activity as well as accelerate economic growth to improve competitiveness. The economic transformation efforts must be undertaken by considering all the potential and the challenges posed by Indonesia. In addition, this roadmap is used as a starting point in terms of developing a mutual commitment between central and local government and the business sector to implement various measures for concrete development. This document is a complementary working document for both the national and regional mid-term development plans. Therefore, it contains the main direction of development for specific economic activities, including infrastructure needs and recommendations for change/revision of regulations as well as to initiate the need of new regulations to push for acceleration and expansion of investment.