SYNERGISTIC DEVELOPMENT PERFORMANCE IN INDONESIA

MAKING SUSTAINABLE DEVELOPMENT PRACTICAL

MASTER THESIS

A thesis submitted in partial fulfilment of the requirements
For The Master Degree from University of Groningen and
The Master Degree from Bandung Institute of Technology

By

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Double Master Degree Programme
Environmental and Infrastructure
Planning Faculty of Spatial Sciences
University of Groningen
And
Department of Regional and City
Planning School of Architecture,
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PREFACE

Learning Environmental and Infrastructure Planning in University of Groningen (RUG) and Regional Development in Bandung Institute of Technology (ITB) gives me an important lesson about new subjects that I have never learned before. Sustainable Development (SD) as the most popular issue in the existing planning debate is one of the interesting topics attached to those study programs. Debate of SD concept and how to make it practical is a kind of never ending story that has to be acknowledged further.

Working in Statistical Office and having Statistical background as my academic trajectory leads me to the curiosity of how to visualize and operationalize SD especially in the regional context. Moreover, the study of how SD goals can be measured is limited in Indonesia due to the lacking method and data. By integrating the knowledge about regional development, statistics and the most important sustainability concept, I try to analyse regional performance towards Sustainable Development with the 'new' quantitative method that has not been developed further in Indonesia. Therefore, I hope this research gives contribution to whom it may concern: Statistics-Indonesia as a government agency developing statistical method and indicator for SD, policy makers in National Development Planning Agency concerning regional development, other related government agencies, Non-government Organizations (NGOs), academicians, etc. Yet, apart from the new insights offered in this research, further analysis and completing study is needed for improvement.

This research, however, is also nothing without contributions and feedbacks from many contributors. Thus, hereby I would kindly thank to: my supervisors Dr. Christian Zuidema and Ir. Hastu Prabatmodjo, MS, Ph.D for their guidance and feedback; the interviewed actors from many institutions for their interesting views; data suppliers that cannot be mentioned one by one; and my little family and friends for their overwhelming supports.

Lastly, herewith I proudly dedicate my research for the academic world especially and planning world, generally.

Groningen,
August, 2013

Ema Tusianti

ABSTRACT

Reaching Sustainable Development (SD) goals is more complicated in developing countries like Indonesia due to the various development agendas needed to be prioritized; not only environmental aspects but also more importantly human welfare related to social-economy as the other development dimensions. It is not an easy task to make those three development pillars working synergistically. On the other hand, various geographical position and huge regional disparities makes another hindrance for creating regional convergence or equal development.

By analysing SD pillars simultaneously, generally the quantitative result reveals that during 2006-2011, more balanced development is quite visible but future trend can be predicted unbalanced again due to the higher speed of growth of economy compared to the social and environment achievement. Meaning that, existing development mainstream more focuses on economy. Highlighting the correlation between those three pillars, it seems that economic development positively correlate with social but not correlate with environment, meaning that complementarily relation between sustainable development triangle edges only happens between economy and social. Those circumstances are also supported by actor opinions pointing out the impact of decentralization, more market intention and direct election as a part of new political system in Indonesia after Suharto regime fallen. Those factors are the culprits of non synergistic development between development dimensions and between regions.

Key words: Development dimensions, Regional Divergence, Sustainable Development, Synergistic Development

ABREVIATION

AHP	:	Analytical Hierarchy Process
BAPPENAS	:	*Badan Perencanaan dan Pembangunan nasional* (Ministry of National Development Planning)
BPS	:	*Badan Pusat Statistik* (Statistics Indonesia)
BKPM	:	*Badan Koordinasi Penanaman Modal* (Indonesian Investment Coordinating Board)
DoS	:	Dashboard of Sustainability
GDP	:	Gross Domestic Product
GIS	:	Geographic Information System
GRDP	:	Gross Regional Domestic Product
HDI	:	Human Development Index
HTI	:	*Hutan Tanaman Industri* (Industrial Forest Plantation)
IISD	:	International Institute for Sustainable Development
MP3EI	:	*Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia* (Acceleration and Expansion of Indonesia Economic Development)
RPJMN	:	*Rencana Pembangunan Jangka Menengah Nasional* (National Medium Term Development Planning)
SD	:	Sustainable Development
SDI	:	Sustainable Development Index
SDIs	:	Sustainable Development Indicators
UN	:	United Nations
UNCSD	:	United Nation Commission for Sustainable Development
UNDESA	:	United Nations Department of Economic and Social Affairs
WCED	:	World Commission on Environment and Development:

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CHAPTER 1 INTRODUCTION

1.1. Background

One of the greatest challenges faced by modern society is the realization of a sustainable society. Hence, Sustainable Development (SD) becomes a widely recognized goal for the society since deteriorating environmental conditions in many parts of the world reflect its sustainability may be in danger (Bossel, 1999). Therefore, the discourse of sustainability currently becomes more popular as an urban and regional development strategy than previously (Krueger & Gibbs, 2007).

However, realizing SD goals in developing countries is more complicated because of some reasons. Budgetary constraints are significant limiting factor for increasing national capacities to reach sustainable development goals (Hardi & Zdan, 1997; Munasinghe, 2004). High number of poor people (UNCSD, 2001), rapid growth of population triggering huge energy consumption are also hindrances in developing countries (Hardi & Zdan, 1997; UNCSD, 2001; Nikolajew, 2004). On the other hand, low qualities of health status and education achievement are also threats to realize sustainable society (Mederly, Novacek, & Topercer, 2004). In short, the basic needs of people in developing countries are not being met but they have legitimate aspirations for an improved quality of life (Michalos, Creech, McDonald, & Kahlke, 2009).

According to those circumstances, measuring regional performance in developing countries in respect to SD is highly needed. The threats of sustainability should be recognized to show the position where a region stands with respect to the goal of sustainability. Thus, SD goal has to be translated into practical dimension to make it easy to be measured.

The measurement through indicator formulation is important in policy making as well as planning. The indicators can perform many functions. One of them is guidance for better decisions and more effective actions by making aggregated information available to the policy makers. Indicators also help measure progress toward sustainable development goals. Furthermore, they can provide an early warning to prevent economic, social and environmental deteriorations. They are also important tools to communicate ideas, thoughts and values (United Nations DESA, 2007).

In addition, according to Briassoulis (2001) indicators in SD planning support decisions in four purposes: (1) explaining and describing the existing condition of spatial systems and its deviation from some reference state; (2) functioning as an impact assessment/evaluation of the effect of particular actions; (3) predicting the future conditions of spatial systems under various scenarios of socio-economic and environmental change; (4) monitoring the changes in the spatial systems and supporting appropriate corrective actions.

The SD measure itself should be developed at every spatial level such as village, town, city, county, state, nation, continent and world (Bossel, 1999), or seen as administrative areas (Schleicher-Tappeser, 1999). The regional level is suggested as an appropriate level, between local and national decision structures (Hardy & Lloyd, 1994; Paterson & Theobald, 1995; Schleicher–Tappeser, 1999). But, the definition of a region might be various depending on the purpose. It can be state, province, sub-nation, etc.

In addition, the measure should perform multi-dimensional aspect involving economy, social and environment because of some reasons. According to Koglin (2009) the concept of sustainable development is various and vague but the further term of SD and sustainability imply three different aspects or dimensions: social, economic and ecological or environmental/ecological sustainability. Those dimensions are the basic element of sustainability and sustainable development (Munier, 2005; Basiago, 1999). According to Campbell (1996) these three dimensions are also regarded as planner's triangle. In that case, SD is the balance of the three goals (economic development, environmental protection and equity-social justice-). Therefore, the position of SD can be regarded at the centre (Campbell, 1996).

Unfortunately, much of today's practice in sustainability focuses on economic sustainability or economic solutions. Instead of regulating and planning for a sustainable society, the development in recent years has been towards more market and more growth, which clearly stands in contradiction to the social and ecological aspects of sustainability (Koglin, 2009). This challenges planners to recognize that the three dimensions create complimentary as well as conflict for decision making (Campbell, 1996). This challenge is much greater in developing countries.

Indonesia comprising 33 provinces and more than 200 million populations is a good example for analysing the SD performance because of many challenges. The big population number, the wide archipelago area, the complexity of population

characteristics and uneven development problems are the obvious challenges faced by Indonesian government to reach the SD goals.

Actually, to cope with SD issues Indonesian government policy adopt SD concept in the last present time. Since 2007, the main government strategy toward SD are *pro-growth, pro-poor, pro-job and pro-environment* (Sekertariat Kabinet, 2012). Unfortunately, the development is seen centralized to economic aspect –the growth-, although all strategy is the priority. According to Nugroho (2012) and Khudori (2012), based on many statistics, Indonesian Government can only force the economic growth without increasing equality or welfare. Hence, there are many questions emerging; which regions has already performed synergistic growth of economic, social and environment development; which regions perform better on economic achievement but less in social and environment performance; what should decision makers do toward those synergistic or non synergistic situations and so on.

1.2. Research Problem

Analysing regional performance toward SD in each development dimension is obviously needed because SD policy is constructed starting from the lowest level. In addition, performance comparison between economic, social and environmental achievement is also important to see the development balance. Unfortunately, there are limited researches constructing and analysing SD measure aggregately at regional –provincial- level in Indonesia. The aggregate measure, such as an index is a compact assessment of a set of indicator in each development dimension –economy, social and environment-. The existing SD Index (SDI) is still constructed in national level by comparing the performance of one country including Indonesia with the others.

The reason of limited study about SD assessment in sub-national level is because of complex requirements for constructing the measure starting from choosing appropriate indicators, method and data needed. This is in line with Pintér, Hardi, & Bartelmus (2005) argument that aggregated indexes are attractive for communication with citizens but the data should be high quality, consistent and comparable. In addition, complete indicator sets, plus a political consensus on indicator weights which is difficult to be achieved on either an international or even national or sub-national level are also the constraints (Pintér, Hardi, & Bartelmus, 2005). Besides, data reliability, incomplete coverage, measurement biases are additional challenges in developing countries (Bagolin, 2004).

On the other hand, comparing sustainability and capturing the trend of development in the three SD dimensions are very essential to examine the pattern of each dimensional trend as the figures of sustainability condition. This will be more important if the relationship of each dimensional development can be identified, for example the relationship of economic development and environmental condition as well as social development. As many arguments said that today practice of SD still focuses on economic instead of others especially in developing countries.

By considering many aspects -the availability of the data, the appropriate method which should be selected in order to fit with SD concept- this research is aimed to capture the position of a region toward sustainable development in order to formulate appropriate policy in planning making.

1.3. Research Questions and Objectives

To capture the position of a region toward sustainable development, it is important to examine:

1. What indicators can be used to demonstrate regional performance towards sustainable development in three pillars (economic, social and environment)?
2. How is the condition of the regions in terms of sustainability in those three development pillars?
3. Are these development dimensions working synergistically in the regional level?
4. If there are biased policies, how can more synergistic performance be stimulated?

Therefore, in order to answer the research problems, this research has several objectives:

1. To select the appropriate indicators of sustainability in Indonesia on a regional level
2. To analyse regional performance toward sustainable development in three pillars (economic, social and environment)
3. To analyse the degree of synergy of each sustainable development dimension
4. To formulate policy recommendation if development of three pillars is not working synergistically

1.4. Research significance

This research aims to analyse the position of a region toward SD achievement at provincial level in Indonesia. For that circumstance, as an evaluative study, the research can be used as a base-line of policy determination both in economic, social and environmental aspect. Then, it can contribute to strengthen policy implementation as the function on monitoring the changes and predicting future conditions.

Specifically, by analysing social, economic and environmental performance of each region, decision makers can easily identify for example which group of region needs focusing on social development, and which regions having un-balanced development. Therefore, the policy direction will be clearer about what are the prioritized actions.

This research is also meaningful to debate or support a concept attached to Sustainable Development. Therefore, the contribution is obvious to academic literature, stakeholders, and also to whom it may concern.

1.5. Scope of the study

The focus of this research is analysing regional performance towards SD goals. There are two reasons why regional level is used. First, according to many researchers, regional level is suggested as an appropriate level, between local and national decision structures, at which environmental, economic, socio-cultural and political processes are usually integrated (Hardy & Lloyd, 1994; Paterson & Theobald, 1995; Schleicher–Tappeser, 1999). A region in this study is defined as a province as a spatial system of observation unit. Secondly, in Indonesia, data is more available in provincial and national level instead of lower scale such as municipality or regency.

However, another focus of this study is the use of indicator which is determined by data availability, besides the relevance to the sustainability concept and the fulfilment of some requirements. Therefore, the scope of analysis is only based on selected indicators by assuming other factors are constant. Meanwhile, the reference period of the study is limited into two periods: 2006 and 2011 by considering that four development strategies *pro growth, pro poor, pro job and pro environment* has being formulated in between that period (2007). Thus, it is interesting to compare the performance before and after 2007. Another reason is the number of province becomes 33 since 2006 when previously it was 31, while the period of 2011 is chosen based on the condition of the newest data in general.

Since the research also focuses on the synergistic performance of three development dimensions, defining its term is important. In this research, synergistic relationship is captured based on the balance performance of three dimensions through statistical measure by comparing actual performances and the future targets in each development dimension. Thus, the speed and the comparative position of each aggregated performance can be identified as a signal of the degree of synergy. The synergy is also measured by the existence of correlation between the dimensions.

1.6. Methodology

To achieve the research objectives, some methods and mechanisms are utilised. The first objective is the key element which will determine the result of the further analyses. In this case, a large number of indicators will be selected to formulate appropriate indicators showing economic, social and environment performance. All data needed should show performance/achievement or outcome and threats of the development in three dimensions (economy, social and environment). In addition, some other requirements have to be fulfilled - appropriateness and validity, uniqueness, accuracy and reliability, completeness, controllability, and availability (Hatry *et al*, 1977 in Hemphill et al, 2004). The data will be obtained from many government institutions.

However to reach the second and third objective, statistical methods will be harnessed as a part of quantitative approach in the study. Analytical Hierarchy Process (AHP) is a part of the research methods. AHP helps to determine the relative importance of an indicator to the others. In aggregating the set of indicators, composite index method is used in order to represent regional performance towards sustainable development in each dimension and also the aggregated index called as SDI. However, as supporting tools, Expert Choice and Geographic Information System (GIS) are utilized. As a comparison of the quantitative measure, actor opinion is also important. Thus, interview becomes another technique of this research methodology.

Meanwhile, to reach last objective –determining policy recommendations- expert opinion are also needed to capture what should be exactly done, what actions have already done after analysing the development in each dimension. This is aimed to formulate policies when the development of three SD pillars is un-balanced. In addition, expert opinion is also essential to assess the appropriateness of the indicators used in the study related to the first objective. In that case, interview utilising survey instrument, such as questionnaire is a base to answer how to achieve the first and the last research objective.

1.7. Research structure

This research will be divided into 6 chapters. The first chapter explains the need of the research, aims and general overview of the study including short description of the method in use and the scope as a limit. Hence, this chapter aims to give general understanding what will be described in the whole thesis content.

However, a bunch of concepts and theories supporting the construction of the thesis will be elaborated in the second chapter. Concepts of sustainability, both in term of economy, social and environment become a part of this chapter. Then, indicators requirements and review about SD indicators from many researches and also the meaning of synergistic relationship of the three pillars will be described in this chapter.

Meanwhile, the third chapter highlights the explanation about methodology including data resources, data collection mechanism until software and techniques which are used to support answering the research questions. The methods are described based on the objective since each research objectives require different approaches to be operationalized.

The fourth chapter describes selected indicators as supporting analysis for the next output of this research –regional performance towards SD-. The selected indicators are illustrated based on its definition, concept behind, and relevance to sustainability concept. Therefore, indicators representing 'sustainability' will be assessed based on its appropriateness to capture what sustainability is in each three development aspects. The reflection of indicator in policy making will be also evaluated in this chapter.

As the most important part, the fifth chapter specifically analyses the performance of the regions towards SD dimensions in term of its trend during 5-year period and its comparison between each dimension as well as comparison between regions. In this case, the existence of unbalanced development will be identified. After that, obviously policy recommendation will become a further description which has to cope with several conditions.

Finally, reflecting to the obtained result in the previous chapter, the last part of this research –chapter 6- will be finished by conclusion and recommendation which includes suggestion for future study by seeing the limitations embedded in this research. The recommendation will also elaborate what could policy makers do and what should be considered in formulating policy.

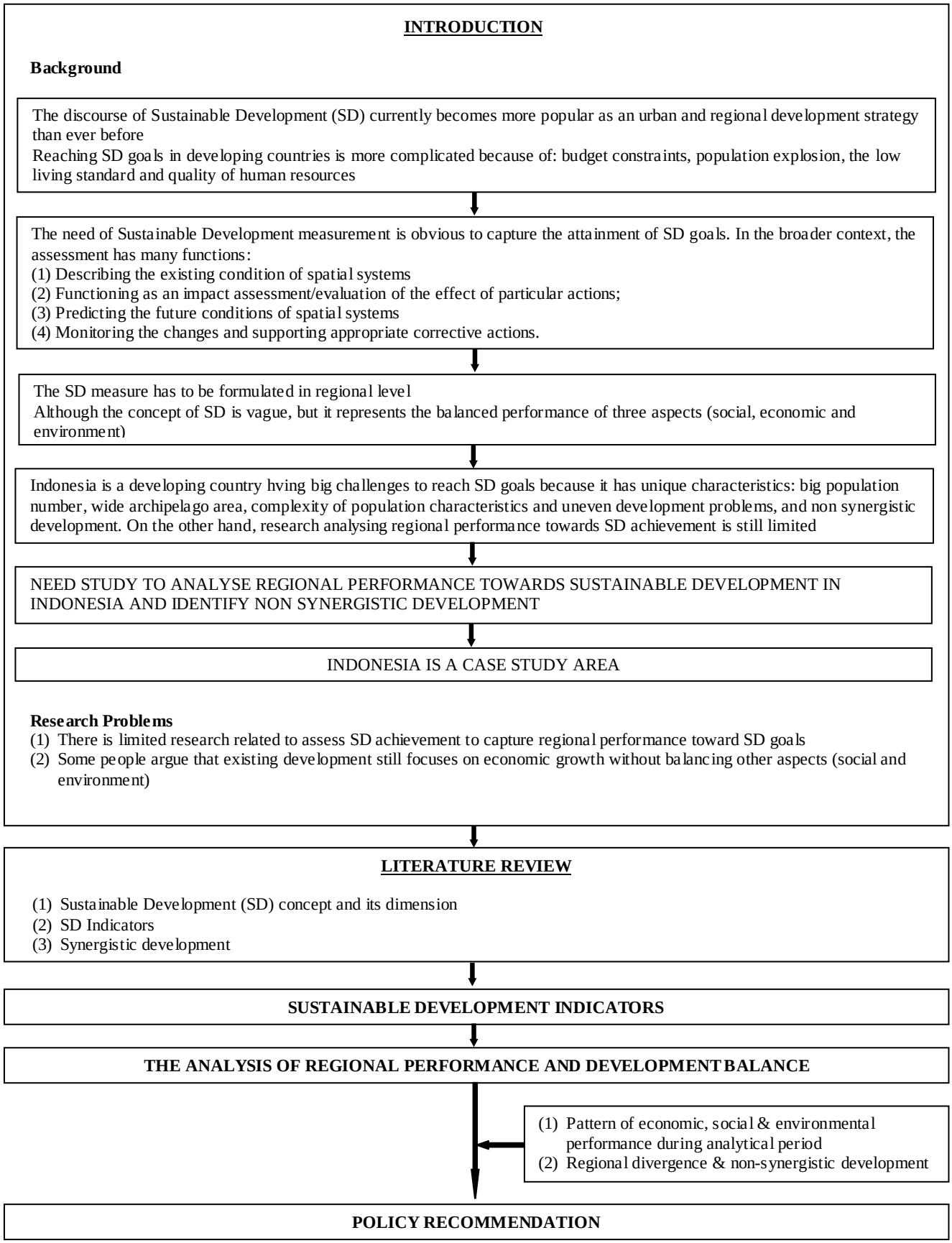


Figure 1.1 Research framework

CHAPTER 2. SUSTAINABLE DEVELOPMENT AND ITS INDICATORS

This chapter elaborates a bunch of concepts supporting the construction of the thesis including sustainability concepts, in term of economy, social and environment. In that case, the translation of Sustainable Development (SD) in the operational term shown by its indicators will be assessed by comparing United Nations (UN) indicators and Indonesian indicators. Then, indicators requirements and review from many experts will also be described as supporting arguments of how the indicators should be. In the last part, this chapter will be ended by the policy orientation to approach synergistic relationship between the three pillars. Finally, those concepts are elaborated in the research framework.

2.1. Sustainable Development: Concepts and Dimensions

The awareness of environmental deterioration has emerged since many years ago. As a result, a normative concept - Sustainable Development (SD) - has been developed. Unfortunately, from many references SD concept is seen vague. It can be understood intuitively, but it is very difficult to express in concrete or operational terms (Lele, 1991; Jordan, 2008). Therefore, there are many definitions as well as interpretations of this concept (Jordan, 2008). One of the most commonly cited definitions comes from *Our Common Future* report which defines SD as the development which can fulfil present human needs without limiting the future generations to fulfil their own needs (WCED, 1987). Another takes a broader view by defining sustainable development as "the kind of human activity that nourishes and perpetuates the historical fulfilment of the whole community of life on earth" (Engel & Engel, 1990). Whilst, Pronk and Haq (1992) in Holdren *et al* (1995) see SD, for example, more on economic perspective which is shown by economic growth providing fairness and opportunity for the whole people in equality without pressing too much on the limited natural resources and carrying capacity.

More specifically, Holdren *et al* (1995) sees that SD is not only about economy but it has to address ills on human wellbeing: perverse conditions (poverty, impoverishment of environment, possibility of war, oppression of human rights, wastage of human potential), driving forces (population growth, malnutrition, maldistribution of consumption and investment, misuse of technology, corruption) and human frailties (greed, selfishness, intolerance, and short-sightedness, ignorance, stupidity, apathy,

and denial). Almost similar, with the last ill, SD includes the concept of 'evolvability' taken from a Buddhist perspective which has meaning as controlling selfishness in order to create harmonious relationship with environment (Servaes *et al*, 2012).

In short, concept of SD encompasses three major issues as Munasinghe (1994) argues that sustainable development may be defined as "a process for developing some opportunities which will enable individual human beings and communities to meet their needs, as well as to achieve their aspirations and full potential over a sustained period of time, while maintaining the resilience of economic, social and environmental systems". Therefore, the concepts of SD in three major points of view are: (1). Economy which is related to improving human welfare, primarily through increases in the consumption of goods and services; (2) Environment that can be translated to protecting the integrity and resilience of ecological systems; (3) Social which is emphasizing the enrichment of human relationships, achievement of individual and group aspirations, and strengthening of values and institutions (Munasinghe, 2002).

These three dimensions are also regarded as planner's triangle pertaining to Campbell, (1996) in which SD is the balance of the three goals (economic development, environmental protection and equity social justice). Therefore, the position of SD can be regarded at the centre. In that case, the SD concept consists of sustainability on economy, social and environment.

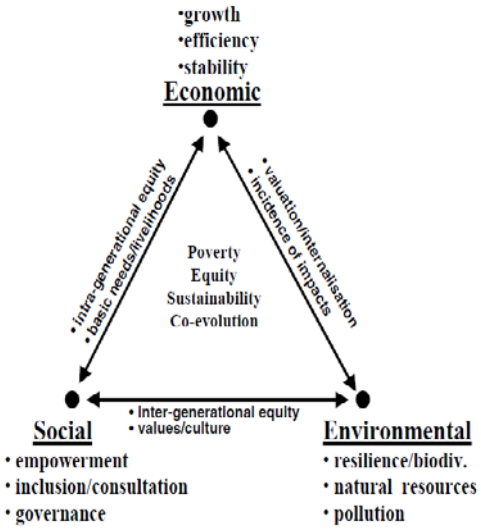


Figure 2.1. Three Sustainable Development Dimensions (Munasinghe, 1992)

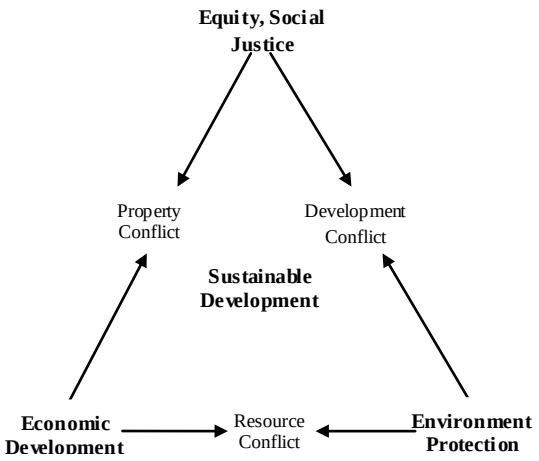


Figure 2.2. Planner's Triangle (Campbell, 1996)

Economic sustainability shows how cities, regions or states can create sustainable economic development and economic progress (Koglin, 2009). Economic progress is often evaluated in terms of welfare (or utility) – measured as willingness to pay for

goods and services consumed (Munasinghe, 2002). It also means a growth as reflected by higher wages, ecological modernization, more effective technologies, etc. (Ekins, 2008) But the economic growth or progress must be sustainable also for future generations, so those generations can have work and economic progress (Munier, 2005; Ekins, 2008). Or, the use of resources today should not reduce real incomes in the future (Moldan, et al, 2012).

In other perspectives, economic sustainability refers to the established requisite for economic growth, capital maintenance, and extends the produced capital concept to include non produced natural capital (Bartelmus, 2004 in Pinter *et al,* 2005). In short, Hicks (1946) in Munasinghe (2004) state that "the modern concept underlying economic sustainability seeks to maximise the flow of income or consumption that could be generated while at least maintaining the stock of assets (or capital) which yield these beneficial outputs". In that case, capability to maintain flow of money (solvency) can be included on economic sustainability (Gassner, 2003).

However, social sustainability is defined broader. It is about inclusiveness and participatory creating dialogues between people and between people and policy makers (Jackson, 2007). Inclusiveness can be empowerment of people, which means that people have more power to decide their own situation (Blewitt, 2008 in Koglin 2009). Strengthening social cohesion and networks (Gilbert, 1996 in Moldan, 2012), and reducing destructive conflicts, are important aspect in inclusiveness (Munasinghe, 2002). Social sustainability also comprises reducing vulnerability (example poverty) social exclusion, unemployment (although this has also to do with economic sustainability) (Ekins, 2008) and maintaining the health of social and cultural systems, and adapting to shocks (Chambers, 2006). Social capital is important in that sense. It is related to the establishment of trust and behavioural norms, and human capital for example through education (Munasinghe, 2002).

Furthermore, generally social sustainability refers to maintenance and improvement of well-being of current and future generations (Chan & Lee, 2008). Well-being itself can be defined as quality of life compromising health status, work and life balance, education and skills, social connections, civic engagement and governance, personal security (OECD, 2011), in addition, nutrition, shelter, and cultural expression (Gilbert, 1996 in Moldan, et al, 2012). Therefore, many indicators of sustainability refer to those aspects.

Meanwhile, environmental sustainability, which also sometimes is defined related to ecological sustainability, "seeks to improve human welfare by protecting the sources of raw materials used for human needs and ensuring that the sinks for human wastes are not exceeded, in order to prevent harm to humans" (Goodland, 1995 in Moldan, et al, 2012). More specific into biogeophysical aspects, Holdren et al. (1995) defines environmental sustainability as maintaining or improving the integrity of the life supporting systems of the earth consisting: (a) biological diversity and (b) the biogeochemical integrity of the biosphere by means of conservation and proper use of air, water, and land resources.

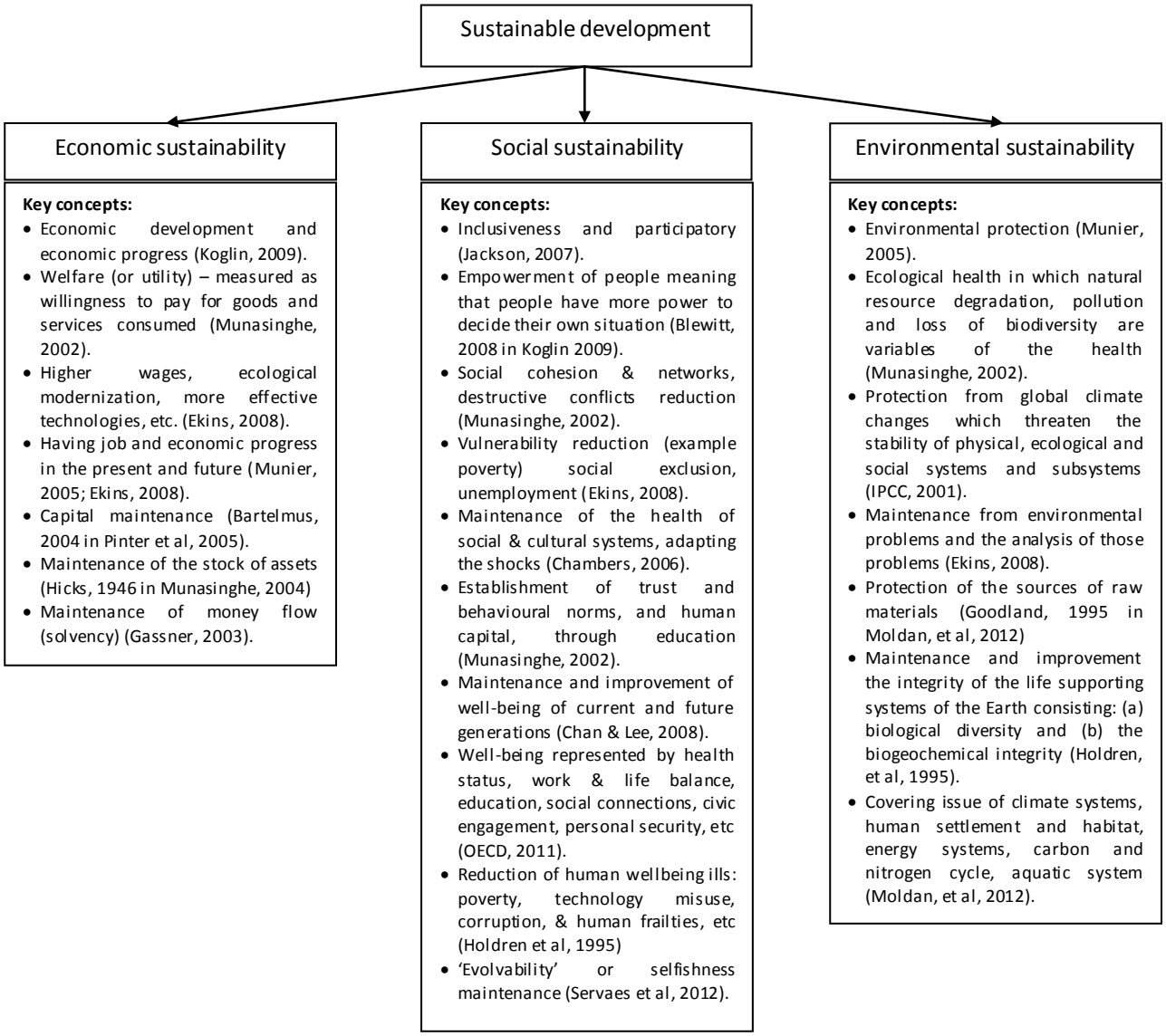


Figure 2.3. Concepts of sustainability in three dimensions

Meanwhile, ecological sustainability in general can be described as environmental protection, quality of physical environment (Munier, 2005), ecological health in which natural resource degradation, pollution and loss of biodiversity are variables of the health (Munasinghe, 2002). Global climate changes, in addition, are the present issue which threaten the stability of physical, ecological and social systems and subsystems (IPCC, 2001). In short, the issue on environmental sustainability covers: (1) Climate systems (climate and climate change, climate risk management, mitigation and adaptation); (2) Human settlements and habitats (cities, urbanization and transport); (3) Energy systems (usage, conservation, efficiency, renewability, and alternatives); (4) Terrestrial systems (natural and managed ecosystems, forestry, food systems, biodiversity and ecosystem services); (5) Carbon and nitrogen cycles (sources and sinks, feedback processes and links to other systems). (6) Aquatic systems (marine, fresh water ecosystems, fisheries, currents and biodiversity) (Moldan, et al, 2012).

2.2. Sustainable Development Indicators (SDIs)

An indicator is a piece of information summarizing a certain characteristics of a system or highlighting an aspect of what is happening in a system. According to Briassoulis (2001) indicators in SD planning support decisions in four purposes: (1) explaining and describing the existing condition of spatial systems and its deviation from some reference state; (2) functioning as an impact assessment/evaluation of the effect of particular actions; (3) predicting the future conditions of spatial systems under various scenarios of socio-economic and environmental change; (4) monitoring the changes in the spatial systems and supporting appropriate corrective actions.

A set of indicators for SD was firstly introduced by CSD UN in April 1995 (United Nation-DESA 1996). In that case, the UN has compiled a guide to measure progress of sustainable development as much as 134 indicators of SD using the Force-State-Response (FSR) Framework (United Nation-DESA 1996). Later on, the former indicators were revised twice, in 2001 and 2007 which results a set of CSD indicators comprising 50 core indicators (United Nations Publication 2007).

Since SD concept is vague, the indicators in some countries can be different depending on the conditions and characteristics. It shows the multiplicity of sustainability context because each community and region develops a system based upon their own circumstances and needs (Innes & Booher, 2000). To show the multiplicity of SDIs, a comparison will be made between the Indonesian set of SD Indicators (BPS, 2011) and the UNDESA set (UNDESA, 2007).

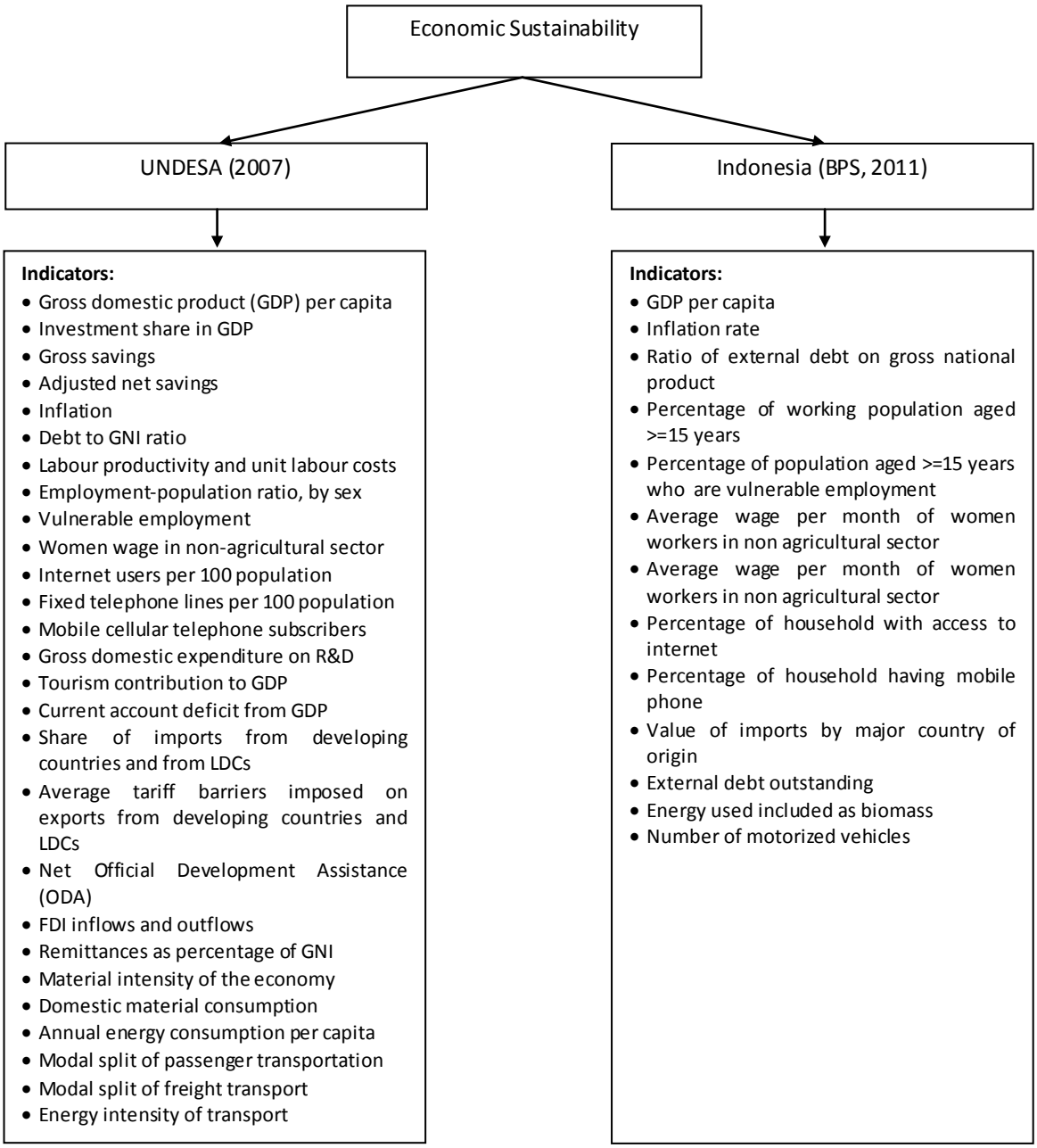


Figure 2.4. Economic Sustainability Indicators

Economic indicators presented in the Figure 2.4 mostly follow UNDESA and they seem really meant for coping with the economic sustainability term. It is true that current situations should guarantee future generation having 'good' living standard. It can be supported by the availability of long-term assets for example specifically on road infrastructure provision and generally the provision of fixed assets. Investment share on GDP are precise measure in this respect. Besides, management of money flow and debt are also important aspects of sustainability. Hence, the inflation rate and related indicators about debt are more exact indicators of economic sustainability. And

obviously, the ability to consume goods and services shown by GDP or purchasing power parity are reliable indicators in the sense of sustainability. Unfortunately, the indicator of technology efficiency referring to Ecological Modernisation as Ekins (2008) argue is not captured. Perhaps, Research and development (R&D) expenditure and professional training can be harnessed as a proxy indicator as The Netherlands uses, for example (Hass, et al, 2002) although it has limitations because there is no separation between R&D for more effective technology to prevent environmental damage and other purposes. However, in Indonesia, the approach of innovation and technology development is only captured by percentage of household with access to internet and percentage of household having mobile phone. Although this indicator is less reliable, such kind of access to technology is still important to trigger innovation.

As developing country having many hindrances for development, human quality in Indonesia still becomes an important agenda to increase wellbeing. Hence, the number of social indicators is far more than that of economic sustainability, almost equal with UNDESA framework. Population explosion, high number of poor people, rapid population growth still becomes big problems in Indonesia. On the other hand, low qualities of health status and education achievement are also threats to realize sustainable society. Hence, it is logical if policy determination in Indonesia still needs a lot of indicators for increasing social status of society.

However, in general both UNDESA and SDIs used in Indonesia has limitation related to the concept of social sustainability as presented by Holdren et al (1995) and Servaes et al (2012). There are limited indicators represent 'evolvability', human frailties and selfishness. But, it is acceptable because the 'evolvability' is hard to be measured.

The indicators of inclusiveness and participatory are also lack. Percentage of population participating in an regional leader election, percentage of women in representative body, percentage of regional planning involving community participation, percentage of population having trust to regional leaders who can bring better liveability are obviously can be used as indicators representing the issue of inclusiveness and participation.

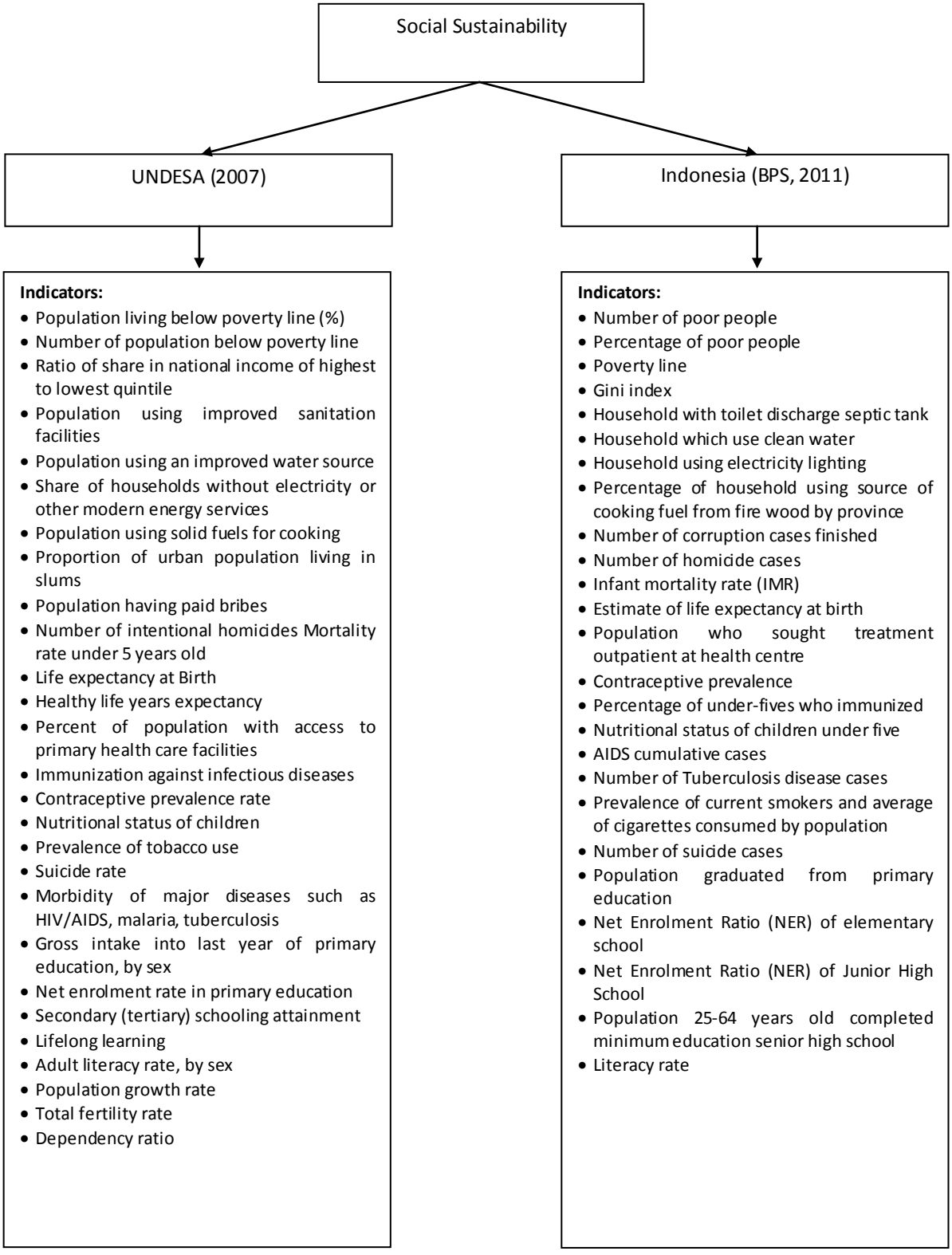


Figure 2.5. Social Sustainability Indicators

Meanwhile, generally the indicators of environment performance represented in Figure 2.6 comprise many themes of environment as Moldan (2012) described. Unfortunately, the issues of green house gasses, pollution, the use of natural resources, the vulnerability, damages to ecosystem, etc are partly captured on those indicators.

In Indonesia, environmental indicators are very limited which only focuses on disaster, emission, terrestrial system such as protected areas, forest, and agriculture, and aquatic system. There are limited indicators for energy system (utilization, conservation, renewability and efficiency) and indicators of human settlements or habitats for example cities, urbanisation and transport.

According to the author experience as a statistical officer responsible to compile secondary data from many institutions, there are some reasons of limited environmental indicators in Indonesia. First, such kinds of indicator are not resonant. Some politicians are more interested on economic and social indicators, for example growth, GDP, unemployment and poverty. In fact, debate always emerges when Statistics Indonesia (BPS) launching the data of those indicators. On the other hand, there is limited response to environmental data. Second, different capacity of local departments to produce the data is a hindrance this is because environmental agency mostly not independent as a single institution. In many regions, the environmental agency is combined with other agencies such as the development agency. In addition, the number of officers is also limited showing the lack of human resource. Third, as an impact of decentralization, each region has own responsibility to collect the data so that in one province, each municipality has different kind of indicator and its availability. The decentralization also influences the availability of the environmental data due to financial matters. Some regions are able to produce environmental reports because of financial aids from international organizations. Forth, Statistics of Indonesia who has the responsibility to collect and compile data under a legal framework Law no 16 year 1997 currently more focus on social-economic issues. Therefore, the SDIs shown in the Figure 2.6 are mostly only available on national level and limited on provincial level and perhaps not available in municipality level.

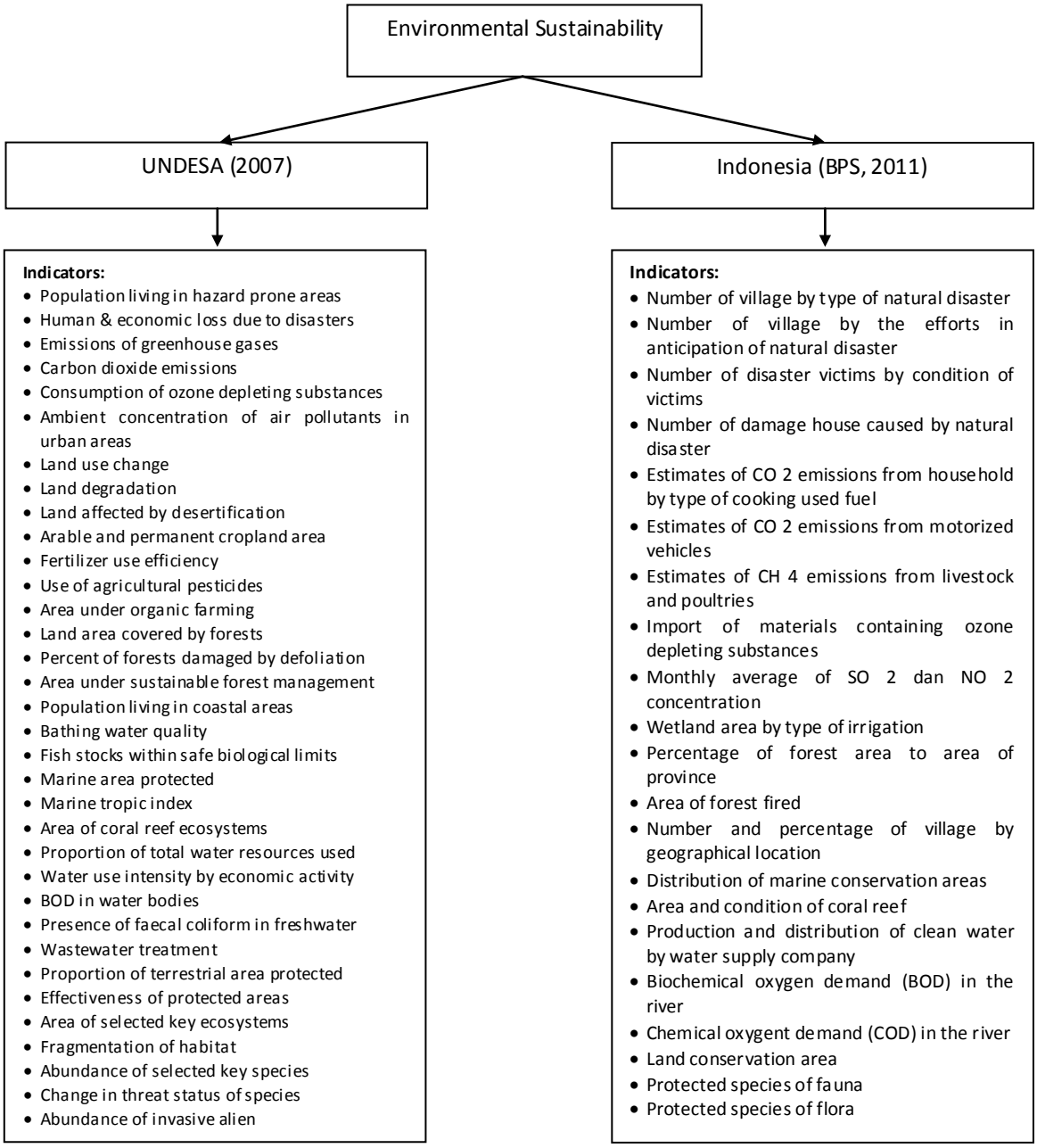


Figure 2.6. Environmental Sustainability Indicators

2.3. How Sustainable Development Indicators (SDIs) should be: Requirements and Future Orientation

This section elaborates the requirements of SD Indicators (SDIs) from many arguments. First, indicators should refer to a multi-dimensional aspect (Briassoulis, 2001). For example, GDP needs additional indicators representing the input and output flows of capital, labour and raw materials of the spatial economy, because an indicator cannot stand alone.

Second, the indicator set must be comprehensive and compact, covering all relevant aspects. " The number of indicators should be as small as possible, but not smaller than necessary" (Bossel, 1999). This argument is based on the fact that a set of SDIs has been developed into hundreds compilations in many countries which is irrelevant with the principle of compactness.

Third, ideally SDIs have to consider local contextual issues. In that case, participation is important since the SD goals pointed to capture general situations but obtained from smaller scale, such as local. Unfortunately, most of the indicator determination is lack of participation (Morse & Fraser, 2005).

Forth, indicators must not only be relevant to local people, but the methods used to collect, interpret and display data must be easily and effectively used by non-specialists so that local communities can be the active participants in the process (Reed, et al, 2006; Innes & Booher, 2000). Mostly top-down framework is dominant where indicator formulation uses expert-based framework (Reed, et al, 2006). Actually, combining top-down and bottom-up framework is a better practice. Bottom-up approach coming from society or micro scale provides a good source of indicators, but also offers the opportunity to enhance community capacity for learning and understanding (Reed, et al, 2006). It also reflects the processes of 'governance' not 'government'.

> "A 'government' focus on the ways that local authority departments devise and use the indicators, with an emphasis on the traditional means–ends or rational decision-making model of local government policy. By contrast, a 'governance' perspective encourages a broader emphasis on a much wider range of policy actors, inside and outside local authorities, and an understanding of the policy process in terms of multiple pressures within networks of relationships" (Rydin *et al*, 2003).

Fifth, indicators should show the transitions and dynamic situations which currently are missing (Briassoulis, 2001; Dahl, 2012). The examples are changes in food and nutrition styles, changes in renewable energy from non renewable energy, reduced use of agro-chemicals, etc.

Sixth, according to Pinter, et al, (2012) SDIs should also follow The Bellagio STAMP principles which can be an additional requirement, namely: (1) Guiding vision; (2) Essential considerations (underlying social, economic and environmental system, dynamics and interactions between current trends and drivers of change; risks, uncertainties, and activities that can have an impact across boundaries; implications for decision making, including trade-offs and synergies); (3) Adequate scope; (4)

Transparency; (5) Effective communications; (6) Availability. The availability of the data is a prominent requirement. Producing an ideal assessment is required but the availability of the data is a common problem in many countries (Briassoulis, 2001).

From many arguments above, not all requirements have been fulfilled by existing SDIs such as (1) the availability, (2) the dynamic situation showing transition, (3) bottom-up process. Thus, it needs solutions for future orientation. First, to overcome the unavailability, actually the use of surrogate indicator is useful. Unfortunately, it does not represent possible indicator but should be reported as the best currently practical indicator (Mitchell, 1996).

Secondly, to show the dynamic situation (Dahl, 2012) both in term of time dimension or the context, some solutions can be used. In term of time dimension, indicators must be supported by data that has a higher degree of continuity (Mitchell, 1996) because sustainability term represents time dimension, past, present and future. Hence, the trends or changes can be identified. Or, early warning indicators as a changing 'sign' can be used to show dynamic situation. For example, an assessment or trend indicator of river quality might be the population of fish found in the river (Mitchel, 1996).

Another solution, panel research can be utilized, for example in the context of poverty, percentage of people changing the position from below poverty line to above the line can be the more appropriate assessment than poverty rate itself. Unfortunately, such kind of indicator is hardly assessed because it needs a cohort analysis which sometimes is not doable. However, if panel survey is not possible, a cross-sectional survey might be useful by combining qualitative and quantitative approach. For instance, to capture transition in poverty, respondent can be asked to give perception about the comparison of their economic situation with the previous one by given choices: better, same or worse. Integrating qualitative and quantitative approach is a suitable solution in this case (Scerri & James, 2009).

The dynamic context also relates to the change of situation because of new phenomenon affecting the meaning of indicator. Therefore, indicator has to be adjusted through 'new method' of assessment. For example, accessibility to Information, Technology, and Communication (ITC) tools as a measure of human 'quality' improvement, Indonesian Statistics used radio, news paper, fixed-line phone and television. But currently, internet, computer/PC/laptop, and mobile phone are considered as an ITC-accessibility indicator. It means that indicator must be adaptive. This adaptability can be a strategy to formulate new SDIs that are attractive for users.

Third, to develop bottom-up indicator -formulated in the smaller levels-, participation is important starting from determination of indicator utility, definition and target. Indicator target is essential for comparison because the assessment is also a policy tool to indicate progress toward set goals of 'sustainability' (Pinter, et al, 2012). The target can be a benchmark for related institutions whether certain level has been achieved or not. So far, only certain indicator of Millennium Development Goals (MDGs) harnessed in SDIs having such kind of target but unfortunately in Indonesia the goals are set up just until period of 2015.

However, since the context of local and global is different to measure sustainability, considering local values is the key process to develop bottom-up indicator. Taking example from some ethnic groups in Indonesia, floor area per capita cannot be used as poverty or housing quality assessment because culturally, a big family must live together in the same house. Unfortunately, this solution –taking local values on indicator- sometimes cannot be use for zooming out the figure of larger or more global scope because indicator is limited to the space –administrative boundaries-.

2.4. The Linkage of The Sustainable Development Indicators (SDIs) and The Policies

Indicators are only a tool for policy making; therefore many other factors can influence the implementation. This depends on the planning situation—"who is interested in what, for what purpose, with what power and resources to do what, when?" (Briassoulis, 2001). In other words, indicators are usually insufficient to produce change in either national decision-making (Holman, 2009) or individual behaviour due to the "political expediency, the weight of vested interests, short-term perspectives and immediate satisfactions" (Dahl, 2012). Thus, indicators are more effective when they are aligned with the values of the users (Dahl, 2012). Thus, determining 'who are the users' is important (Briassoulis, 2001; Mitchell, 1996). Unfortunately, although indicators make sense for the users, still the implementation is not always realized because of limited capacity of institutions, limited budget, lack of political response, and lack of participation in 'local' level (Krank, *et al*, 2010).

How to make indicators useful for policies? The creation of resonant indicator -clear, easy to understand and inspirational (Mitchell, 1996) – can be the answer. "Resonance connotes a situation where an indicator 'strikes a chord' with its intended audience" (Peterson, 1997 in Hezri & Dovers, 2006). Unfortunately, audience is relative depending on the context. Resonant indicators are mostly drawn from the key and

simple composite index groups (Mitchell, 1996). They are mainly formulated based on consensus, sometime in international arena such as economic growth (GDP). In Indonesia, Human Development index (HDI) is resonant indicator in regional level because it triggers reaction of policy makers when their regional ranks are decreasing or increasing, higher or lower in comparison to other regions. Other examples of resonant indicators in Indonesia are poverty rate, economic growth and unemployment rate. Unfortunately, almost none of them are related to environmental indicators.

Then, how to strengthen the link between indicators and policies? Hezri & Dovers (2006) argue there are two possible ways (1) strengthening indicator theory and practice, (2) mobilising indicator within the context of governance. The first strategy is related to searching for cross-scale epistemology, comprehensiveness, user value coherency, and reflexivity to institutional arrangements. However, the second strategy is creating consensus. It means that the indicators can lead to the policies until certain conditions, and then collaborative learning process can determine the ending (Innes & Boher, 2000). This reflects a shift from government to governance which more relies on social basis (Hezri & Dovers, 2006).

2.5. Synergistic Development Between Three Pillars and The Policy Orientation

The complex interdependencies between economic, social and environmental phenomena, and the need to balance or harmonise these over time, have been the focus of particular attention in defining sustainability (AtKisson 1996, Lafferty 2001 in Turcu, 2012). It also means that development must be equitable (interaction between the economic and social dimension), liveable (correspondence of the environment to social needs, which can refer to the concept of quality of life) and viable (economic development must abide with the supportive capacity of the ecosystems, while depletion of non-renewable resources must be avoided) (Tanguay, *et al*, 2010). Unfortunately, realizing those circumstances is a challenge.

According to many facts, existing developments are more focused on economic growth rather than other aspects. As it happens in Indonesia, although the economic situation has continuously improved, social gaps and inequalities are still exist (Khudori, 2012) and so does the environment degradation.

The battle idea of economy and social environment is unavoidably requiring planners to act as mediators, while the complementarily idea challenges planners to be more

creative in building coalitions between once-separated interest groups, such as labour groups and environmentalists, or community groups and business (Campbell, 1996).

Actually, it is hard to realize a synergistic relationship between those three pillars: growing the economy, distributing this growth fairly, not degrading the ecosystem, so that the three pillars are 'balanced' as shown in an equilateral triangle. Thus, the balance situation is utopia. The most possible thing is reducing the distance between three pillars. But then the question is: how to reduce the distance? The idea of Environmental Policy Integration (EPI) can be a policy orientation.

EPI conceptualizes a more holistic approach to cope with policy bias in which non-environmental policy-areas need to consider environmental effects (Lafferty & Hovden, 2003). In this case, according to Underdal (1980) in Lafferty & Hovden (2003) three criteria need to be satisfied: comprehensiveness, aggregation, and consistency. 'Comprehensiveness' refers to time, space, actors and issues; 'aggregation' to the evaluation of policy from an 'overall' perspective, (that is, not merely from the perspective of a particular actor or issue area); and 'consistency' implies that the different components of an integrated (that is, aggregated and comprehensive) policy are in accord with each other. The latter requirement applies across different departments and different levels of governance. But, these criteria sound acceptable in the concept but not in the reality. Power struggles in government and between departments are the hindrances (Jordan & Lenschow, 2010). Secondly, there is a weak profile of environmental issues (Zuidema, 2013).

2.6. Research Framework

Capturing regional performance based on three pillars and measuring the synergistic relationship between those pillars requires certain conditions as seen in the requirements above. The indicators have to follow its requirements which cannot all be fulfilled. But, through elaborating some theories and concepts this research is formulated by trying to approach the requirements. For example, the participatory principle is solved by the use of well known indicators by assuming the formulation of those well known (resonant) indicators has been discussed on international level. The use of resonant (core) indicator also covers the compactness requirement to avoid harnessing too many indicators (Bossel, 1999). Meanwhile, the dynamic situation to capture sustainability concept is reflected by the use of time series data. But, surely availability of the indicators also has to be overcome by using its proxy or surrogate as Mitchell (1996) said.

However, measuring performance of three dimensions requires targets as Pinter, et al, (2012) argument. Thus, the synergistic relationship will be also directly identified by comparing each performance. In that case, existence of policy integration can be identified indirectly although it is not enough as the supporting facts.

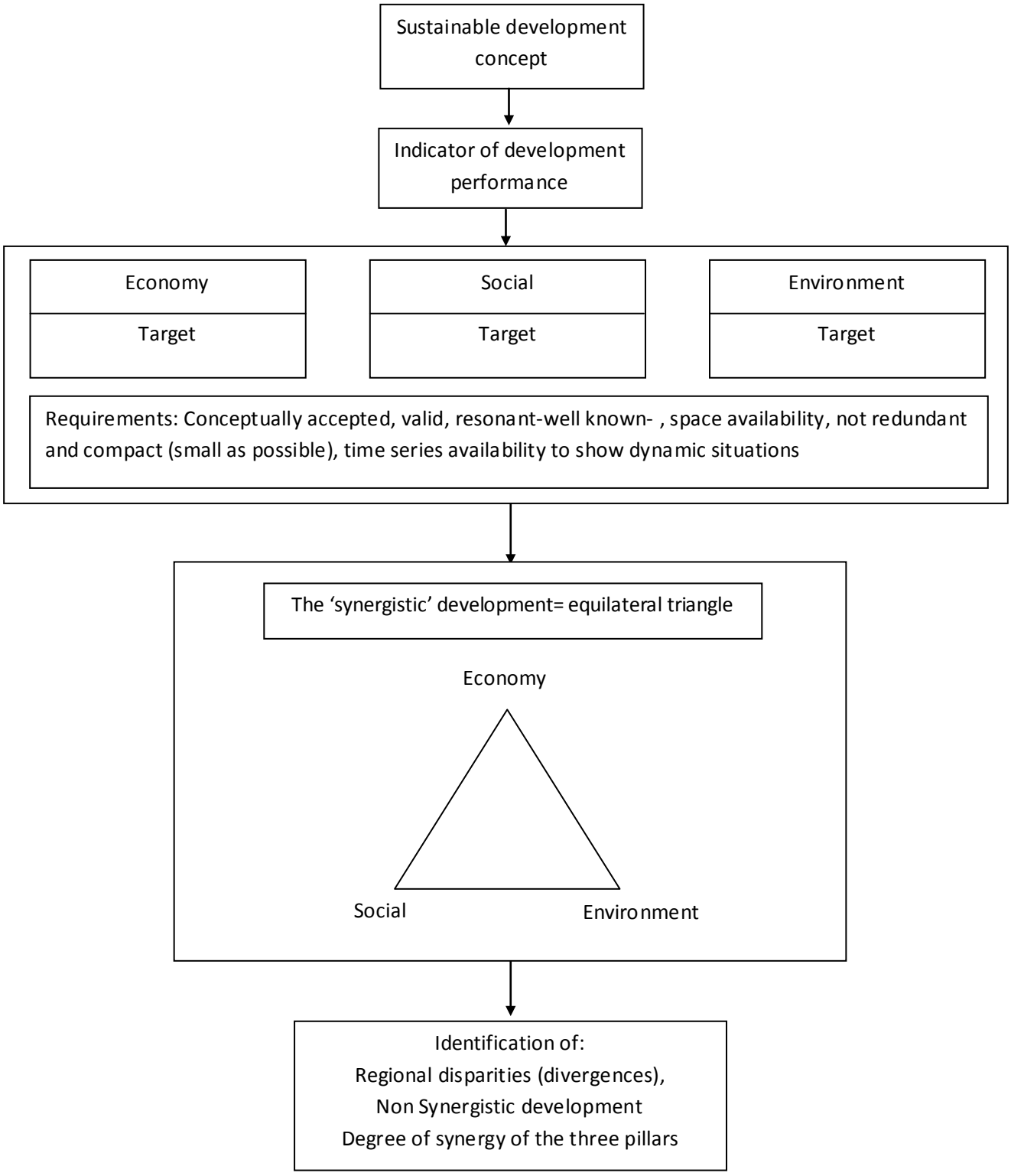


Figure 2.7. Conceptual model of the research

Unfortunately, as shown in the section above there are some dilemmas in capturing regional performance towards SD goals translated in Indonesian development. First, policy biases between development pillars are unavoidable, for example due to the weak profile of one development aspect to the others. Thus, there will be more debates between policies showing the degree of urgency for a certain development focus. Second, local pictures having different level of uniqueness are perhaps more relevant than comparing the figure of regional level. Third, the usefulness of the performance measurement to policy process is still questioned.

But, there are two reasons to analyse regional performance. Firstly, the need for continuously searching more valid and reliable assessment of regional performance is important to see the regional convergence toward economic, social and environmental development goals. In that sense, regional disparities can be identified. In addition, the degree of synergy of those three development aspects can be analysed directly. Secondly, capturing local level aggregately can be seen from a broader scope that is regional figure. Thus, this research is limited in the scope of usefulness which depends on policy maker interests.

CHAPTER 3. METHODOLOGY

This chapter describe the methods used in this research. The detailed explanation will be illustrated based on the objectives to make it easier to be understood. As mentioned previously in the first chapter, the research has four objectives. Therefore, the general picture of the research structure can be seen as follow based on the problem faced in the current conditions: limited study to assess regional performance toward Sustainable Development (SD), the emergence to conduct such research, the need to analyse the development balance, and the need of contribution to policy determination in spatial planning.

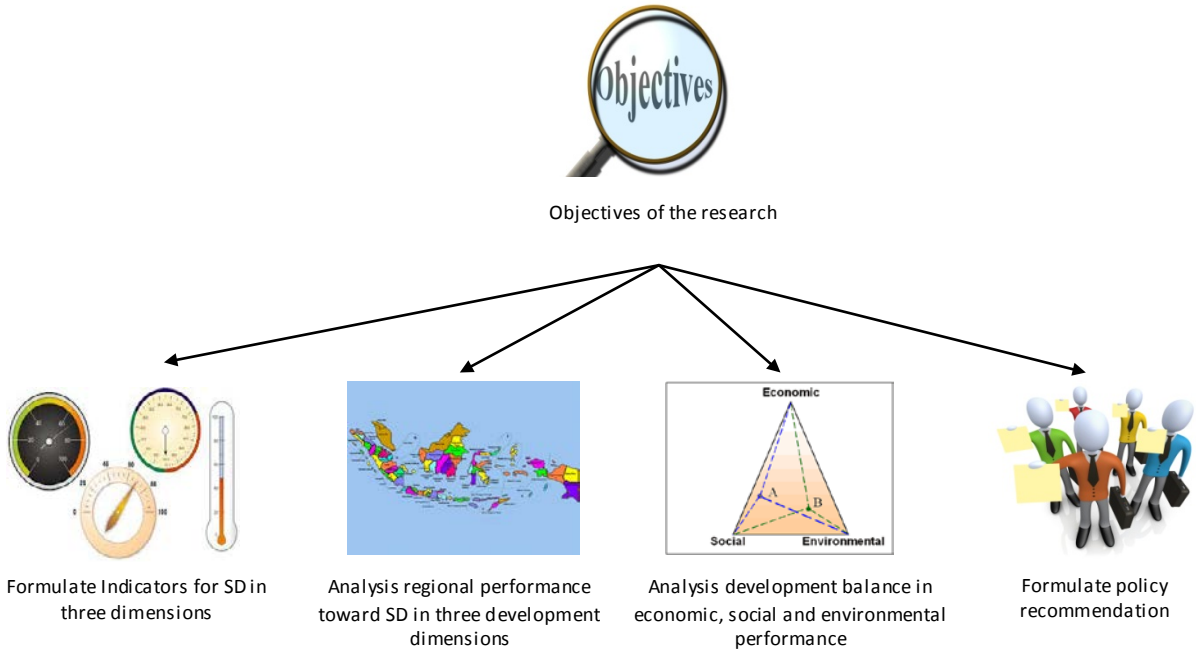


Figure 3.1. Research Objectives

3.1. Indicator Selection

To capture the first objective -formulating indicators which can be used to demonstrate regional performance towards SD in economic, social and environmental dimension- list of indicators of Sustainable Development (SD) from many researches are compiled for example SD Indicators (SDIs) of United Nation Commission for Sustainable Development (UNCSD), SDI developed by Statistics-Indonesia and other individual researches.

The indicators are selected based on some considerations. Firstly, it should be reflect the sustainability concepts showing performance/achievement or outcome and threats of the development in three dimensions. Secondly, it should be available considering the fact that in regional level the variability of data is fewer than national level but more available than in municipality level. Lastly, the indicator has to follow some requirements as stated in the chapter 2.

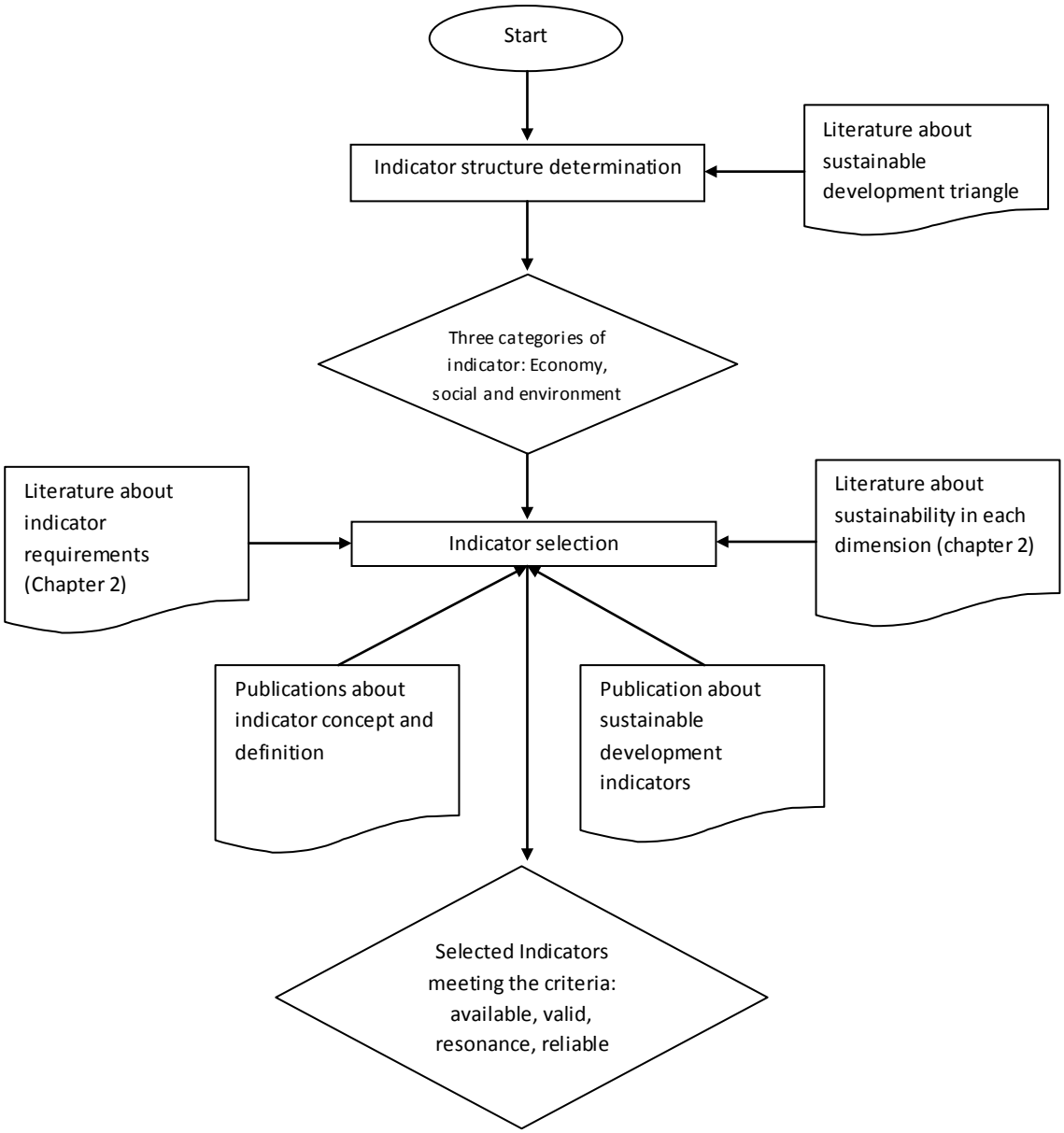


Figure 3.2. Flow chart of indicator selection

However, the mechanism of the indicator selection is based on the analysis of the concept, the mechanism how the indicator/data are computed and its relevance on policy making. Therefore, it needs a lot of information about the indicator description. In this case, review from many literatures about the concept of sustainability is needed.

However, the data itself was compiled from many institutions such as Statistics Indonesia (BPS), Ministry of Energy and Mineral Resource, Ministry of Environment, Ministry of Forestry, Ministry of Internal Affairs and Central Office of Indonesian National Police (Mabes Polri). The data captures performance in 2006 and 2011 to compare the performance before and after development strategy "*pro growth, pro poor, pro job and pro environment*" is developed in 2007. Another reason is the number of province becomes 33 since 2006 when previously it was 31, while the period of 2011 is chosen based on the condition of the newest data in general. Thus, the data period selection is also mainly based on the availability of complete data set.

3.2. Regional Performance Measure

To assess regional performance towards SD, combination between quantitative approach and qualitative approach is used in this research for comparison and complement. The use of quantitative approach requires an aggregated indicator or composite index to summarise the performance shown by indicator sets into general picture. The function of aggregated index is to communicate values from multidimensional realities by summarizing into single value (OECD, 2008). Technically, index construction requires some steps starting from data standardization, until aggregation (OECD, 2008). The detailed processes can be seen in the table 3.1.

Table 3.1. List of index construction methods used in the research

Step	Method	Objective	Reason for choosing the method
1. Normalizing data	Distance from the best and worst performers or targets, in which those values are determined based on the targets or existing condition, using formula: $I_{qc}^{t} = \frac{x_{qc}^{t} - \min_c(x_q^{t_0})}{\max_c(x_q^{t_0}) - \min_c(x_q^{t_0})}$ for positive indicators*, and: $I_{qc}^{t} = \frac{\max_c(x_q^{t_0}) - x_{qc}^{t}}{\max_c(x_q^{t_0}) - \min_c(x_q^{t_0})}$ for negative indicators*	To render the variables comparable	To compare time series results and to compare the position of performance and the target maximum and minimum

	Notes: x_{qc}^{t} = value of the indicator q region c in t year $\min_c(x_q^{t_0})$ = minimum value of existing condition or minimum target $\max_c(x_q^{t_0})$ = maximum value of existing condition or maximum target (adjusted from OECD, 2008) The result is then multiplied by 10 to make it more readable		
2. Weighting Variables	Analytical Hierarchy Process (AHP)	To determine the contribution of each variable	To involve expert opinion
3. Aggregating indicator into each dimensional performance	Linear aggregation	To aggregate all variables into each dimensional index	Easy to be done
4. Composite Index or Sustainable Development Index (SDI)	Linear aggregation	To aggregate all dimensional index into SDI	More suitable for equal weighting

Notes: * positive indicators represent better performance if the value is higher, while negative indicators represent better performance if the value is lower.

As a part of qualitative approach, expert judgment related to relative importance of each indicator is harnessed to determine weight of indicator and development dimension. In this case, 8 experts coming from different expertise and agency were asked to compare indicators in a pair by choosing the scale from 1 to 9, the higher value the greater level of importance of one indicator compared to the other.

The data processing of this method is accommodated by the use of Analytical Hierarchy Process (AHP) as a participatory method (OECD, 2008). However, the data processing from the AHP result is equipped with *Expert Choice* software. The use of AHP itself is based on the reason that AHP facilitates hierarchical structure in which opinions are systematically extracted by means of comparisons (Forman, 1983 in OECD, 2008).

However, the index result is presented into value ranging from 0 to 10. However, as the analytical method, each region is grouped based on its performance in each dimension (0-2 is very bad, 2.01-4 is bad, 4.01-6 is medium, 6.01-8 is good and 8.01-10 is very good). The presentation of this performance value is equipped by the use of Geographical Information System (GIS). The general picture of the methodology in this objective can be seen in Figure 3.3.

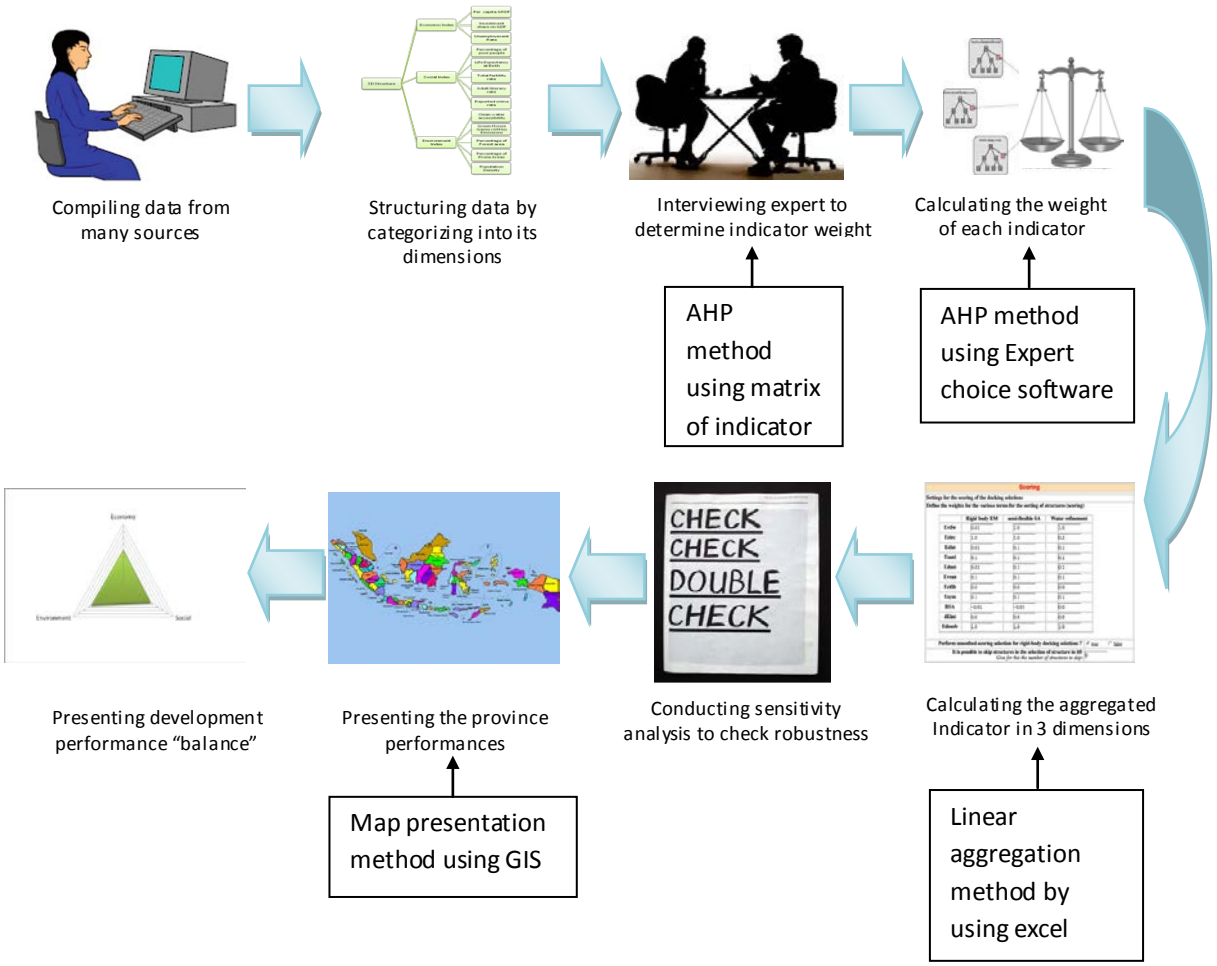


Figure 3.3. Illustration of methodology in capturing regional performance toward SD

3.3. Analysis of Development Balance

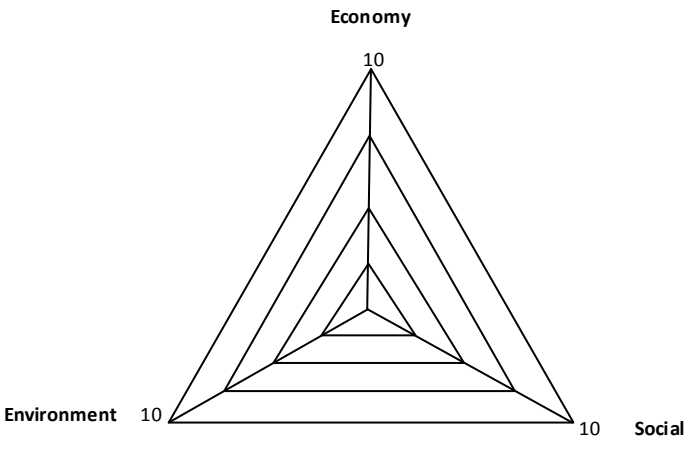


Figure 3.4. Illustration of development balance

This analysis is pointed to analyse of development mainstream as a prove hypothesis that economic dimension is superior to other (meaning that policy still focus on economic growth not justice or environmental protection). The analysis of that situation can be seen based on its comparative value in aggregation seeing the global picture of each province performance. The performance here is identified based on the aggregate comparison between targets and actual achievement. However, the balance can be pictured in a triangle

as seen in the picture. As stated previously, performance is ranging from 0 point to 10 point. Zero is the worst point while 10 is the maximum desirable point showing the aggregated indicators meet the target although it is also possible in some regions the target are already passed showing the value more than 10. But, that case is rare because so far government puts very ambitious targets for the long-term period which currently is still ongoing process.

As a comparison, expert opinion about the synergistic development is also included in the analysis. This utilises narrative approach to conceptualize what the actor believes and what they think about development mainstream. In this case, the opinion of the cause and the sources of unbalanced development will be discussed.

However, capturing synergistic development through visualizing the triangles is not enough without further analysis to capture degree of synergy between three development pillars. Hence, it is important to use statistical method that can analyse the correlation between the development pillars. In this case, Pearson Correlation Test (Chernick & Friis, 2003) is used as the suitable method to test the hypotheses that:

1. Economic performance is correlate with social performance
2. Economic performance is correlate with environmental performance
3. Social performance is correlate with environmental performance

3.4. Policy Recommendation

The last part of the research content is reflection of the analysis into policy making. This is related to the question of "how if there are biased policies, non synergistic performance between each three pillars?" It will reflect how generally the existing government policy influences on the reality, what actions need to be taken, what actions have been taken, etc. To get this overview, stakeholder opinions are needed. The stakeholders for this objective are the same as the experts who give opinion about indicator weight and non-synergistic development (sub chapter 3.2 and 3.3). They come from different expertise and agency, which are:

1. Head of Environmental Pollution and Degradation Control Division - National Development Planning Agency (BAPPENAS)
2. Head of Regional Economic and Social Analysis Division - National Development Planning Agency (BAPPENAS)
3. Head of Environmental Statistics Division - Statistics Indonesia
4. Head of Natural Resource Management Sub-Division, Ministry of Environment

5. Expert on Population Study
6. Expert on Urban and Regional Development mainly concerning on poverty
7. Expert on Forest and Habitat Management
8. Manager of Science Development Wahana Lingkungan Hidup Indonesia (WALHI) - NGO concerning on environmental protection and justice advocacy.

CHAPTER 4. SELECTED INDICATORS: PRIORITY, TARGET AND USEFULNESS

This chapter describes the selected indicators obtained from many sources such as encyclopaedia of indicators in many publications: *Statistical Yearbook of Indonesia* (Statistics-Indonesia, 2013b), *Ensiklopedia Indikator Sosial dan Ekonomi* (Statistics-Indonesia, 2011), *Indikator Pembangunan Berkelanjutan* (sustainable development indicator in Indonesian Language) (Statistics-Indonesia, 2012a), and several contents from United Nation publications, such as *Indicators of Sustainable Development: Guidelines and Methodologies* (United Nations, 2007) and *Indicators of Sustainable Development: Third edition Methodology Sheets* (United Nations, 2008).

This section is divided into four parts. The first part is the structure of indicator presented on a hierarchical tree and the second part explains the relevance of the indicators which is assessed based on the concepts presented in the second chapter and the relative importance based on the expert opinions. The third part approaches the indicator target for 'sustainable situations' and the fourth part discusses the usefulness of an indicator based on expert opinions. This last part is important because as pointed on Chapter 2 the problem of Sustainable Development Indicators (SDIs) is the connection with the policy. This will be connected to the recommendation in the last chapter of this research.

4.1. Indicator Structure

The structure of indicator can be seen in the Figure 4.1 where economic indicators describe economic structure, unemployment and investment. Meanwhile, social indicators comprise the theme of poverty, health, education, gender equality and security. However, environmental indicators cover the issue in water, air (green house gases), land, and urbanisation. This indicator set has been selected based on three conditions: conceptually accepted, resonant, available, and fulfil other requirements as described on Sub-chapter 2.3. This selection is very subjective. In addition, relaying on data availability and approximation of the real measure are inevitable, making performance measurement is not free from biases. Therefore, although this research aims to get better approach to analyse regional performance towards sustainable development (SD), there will be always some limitations, especially in the indicator selection part which needs a combination between science and pragmatic choices. That is the most challenging part of this research because in one hand considering theory and concept is important but relying availability of the data is a hindrance.

The impediment of data availability per province and per year is related to some issues. For example, to show maintenance of money flow and solvency (Gassner, 2003) debt value are important for sustainable economic capital in the future, but the data is only available on national level and so is the inflation rate which only available for many cities. In addition, the environmental data is also limited. For example, quality of water is only assessed for regions having river flows, so does the polluted areas which are only measured in the city centre. Therefore, quality of water and air are partially captured in this research.

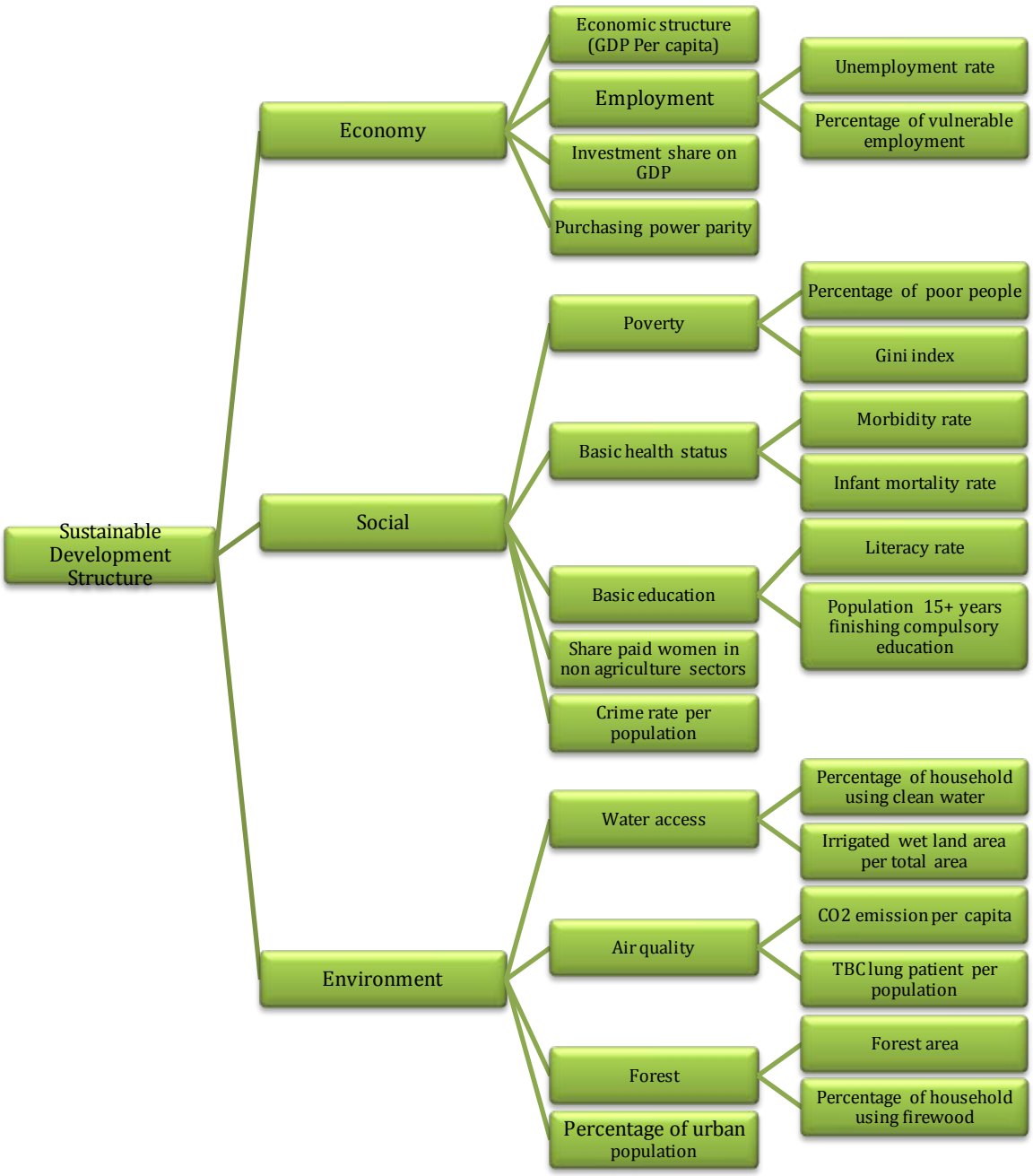


Figure 4.1. Indicator structure

Although the selected indicators are limited in number, but they already captured the multidimensional issues in sustainability concepts as shown in Chapter 2. Thus, the indicators already fulfil compactness requirement as Bossel (1999) said "The number of indicators should be as small as possible, but not smaller than necessary". And the most important thing is that, the indicators are resonant, in fact almost all indicators are considered on National Development Planning both long-term and short-term.

4.2. The Relevance and The Relative Importance

Connecting to the concepts as described in the Chapter 2, it is important to assess the relevance of the selected indicators in the sustainability terms. Why they are chosen, what is the concept of indicator itself, and what is the connection to the sustainability concepts. The assessment of each selected indicator can be seen in Appendix 1. In that appendix, the indicators are suitable with the concepts of sustainability in three development dimensions (Figure 2.3).

But, each indicator has different relative of importance compare to the others. According to the result of expert judgments, purchasing power parity in economic dimension has the highest relative importance compare to production of services and goods, investment rate and employment status. However, in social and environmental dimension, health status and poverty and water accessibility are the highest concerned issues to reach sustainable development goals (see Figure 4.2).

Those figures show how the actors conceptualize the notion of sustainability for each dimension and the prioritized problems to be solved since sustainable development concepts have multidimensional issue. As some people argue that developing countries face many challenges to realized sustainable society, not only environmental degradation problems as the background of sustainable development concept, but also high number of poor people (UNCSD, 2001), rapid growth of population (Hardi & Zdan, 1997; UNCSD, 2001; Nikolajew, 2004), low qualities of health status and education achievement (Mederly, Novacek, & Topercer, 2004). Therefore, there should be a prioritize issue in the strategy implementation.

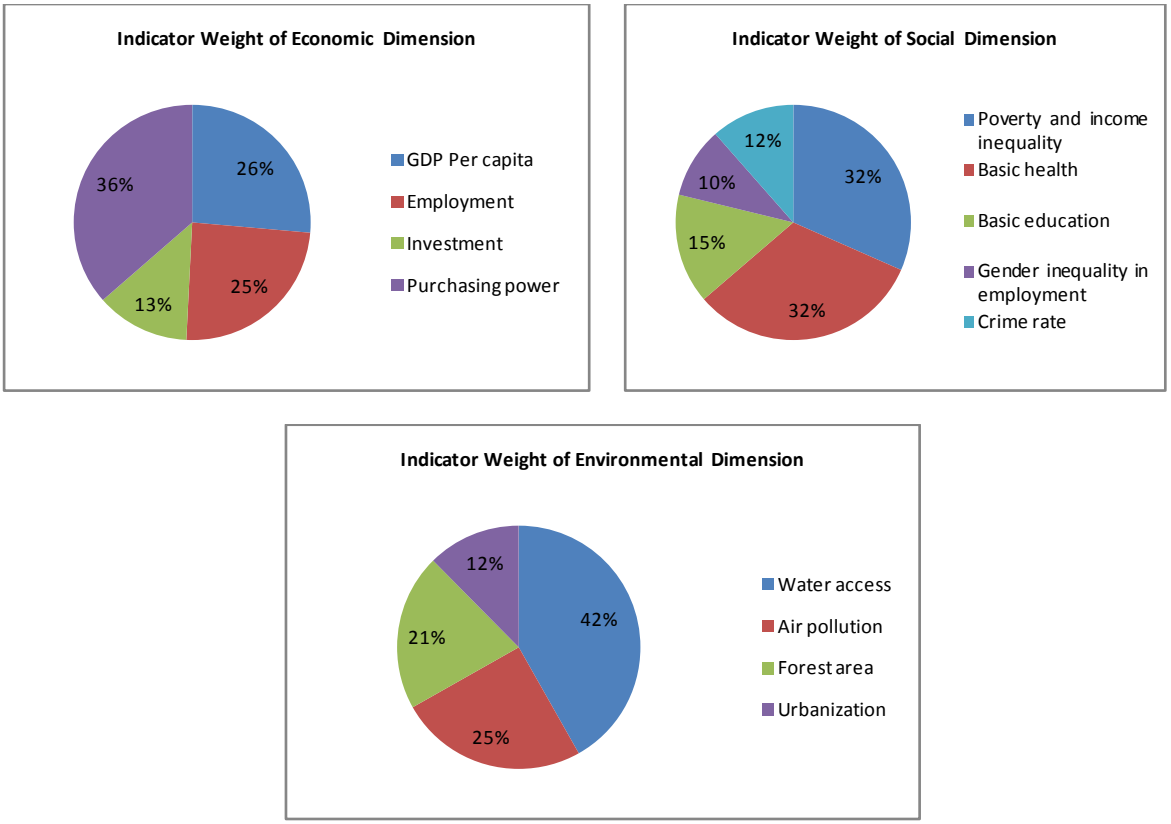


Figure 4.2. Indicator Weight in Three Dimensions

The figure also illustrates the multiplicity of sustainability concept which is context dependent -each community and region develops a system based upon their own circumstances and needs (Innes & Booher, 2000). Thus, the figure is only suitable for Indonesian case according to the subjectivity of selected actors which obviously also have multiple interpretations.

4.3. The Targets

Indicator target is essential for comparison because the assessment is also a policy tool to indicate progress toward set goals of 'sustainability' (Pinter, et al, 2012). Setting goals, objectives and targets for certain time horizons, are important in designing courses of action to be implemented with particular means and implementation processes (Briassoulis, 2001). Lancker and Nijkamp (2000) in Singh, et al (2012) give more emphasise of target function "a given indicator doesn't say anything about sustainability, unless a reference value such as thresholds is given to it".

The target can be a benchmark for related institutions whether certain level has been achieved or not. In planning documents, development targets are determined based on the previous path and represent ambitions. Although it is hard to give point to the notion of 'sustainability', still the benchmarks are needed. In this research, the targets are obtained

from medium and long-term planning for certain resonant indicators such as GRDP per capita, poverty rate, unemployment rate and infant mortality rate. However, for other indicators not included in those planning documents, the targets are determined based on the conditions in other countries experiences or making-sense situations such as the target of Gini index, morbidity rate, crime rate, the use of firewood are zero or the target of literacy rate, primary education attainment, and clean water access are 100 percents. The targets can be minimum or maximum level depending on the indicator itself. For example, CO2 emission target is 0 or the minimum level, while the target of clean water access is 100 percent as the maximum level. Both targets should be complemented by its minimum or maximum level to limit the desirable performance. The detailed indicator targets can be seen in the Appendix 2.

Determining selected indicators and the targets requires judgment which should be supported by literatures. This research tries to approach the notion of sustainability based on many literatures defining sustainability in three development pillars. This is the way to operationalize the concept of sustainable development which also should be complemented by the targets or the goals to represent in which position a region stands for sustainability achievement. In this case, combining science and pragmatic choices is also needed to select the making-sense indicators and their targets. But, this selection is limited by the availability of data and information of what point of direction want to be achieved.

4.4. The Use of SDIs

The selected indicators are mainly considered on development planning agenda showing the resonance of the indicators for policy determination. But, it is not a guarantee in the implementation (Holman, 2009). Thus, indicators are more effective when they are aligned with the values of the users (Dahl, 2012). Thus, determining 'who are the users' is important (Briassoulis, 2001; Mitchell, 1996). In this research, however, confirming the functions and the users of the indicators becomes another interesting point. This is also a way to confirm whether the measurement in this thesis will be useful or not. And, how to make it more used will be an essential recommendation.

According to the Head of Environmental Statistics Division publishing the report of SDIs, the indicators are functioned for monitoring development. There are a lot of users of this publication including planners, National Development Planning Agency (BAPPENAS), Ministry of Environment and other users such as academician, non government agencies. Therefore, the function of SDIs is obvious -monitoring and evaluation-. As an expert in BAPPENAS said:

> "Indicators are very important to lead development policy in the future. In that case, an indicator is used as a base line in development planning such as to assess where the position of achievement compared to the target, for example in the five-year period of planning. Through the target, the program will be developed and the actions (implementation) will be evaluated. However, an indicator is developed based on the sector. In forestry, the example is deforestation which is expected to decline every year and city forest is targeted to increase 2.300 Ha per each province and hotspots decline 20% each year or 67% per 5 year."

Without indicators, development will be conducted blindly, since the indicator is the leading measure to acknowledge which direction is desired. But, unfortunately the practice of indicator as the development guidance is hindered by politic, as an expert in Statistics-Indonesia commented:

> "SDIs are important for policy making because indicators are used for monitoring. Gathering data is costly but development without data and information is very much costly. Unfortunately sometime, political matters are a hindrance. It is hard to convince the importance of the indicators".

This is similar with argument of an expert in urban and regional planning who emphasises the importance of indicators in decentralization era showing that there is a gap of implementation. He stated: "Nationally, indicators are important and influential, but regionally, political practices in decentralization era are far more influential than the indicator itself."

The usefulness of an indicator in the decentralization practice is influenced by need of development funding making the policy makers find another way to reach the goal. Sometimes, it makes planning is bent in the implementation as the Head of Environmental Pollution and Degradation Control Division in BAPPENAS stated:

> "Sure, indicator is useful but it also depends on financing. One indicator is only a sign of the information and the applied policy is behind the information of the indicator. But, at least we can assess the achievement of development target and the position where the region stand for an indicator."

In this case, the indicator must be as resonant as possible to increase the degree of its usefulness. The only way to make indicators more resonant, currently regional and national governments frequently gives reward for the better performers as Head of Regional Economic and Social Analysis Division in BAPPENAS said. Unfortunately, government is still searching for the more reliable indicators for sustainability to capture the performance. An actor in Ministry of Environment agency stated:

> "The existing SD indicators are still categorized as regular development indicators not specifically focus on sustainability concepts; they are seemed as sector by sector indicators which are separately assessed. The need of research is obvious which can

> integrate economic social and environment dimension for more precise assessment. But, there is a problem, for example costs of environment for other developments are still hard to be assessed..... So far, Green GDP is the most approaching indicator."

In short, each interviewed actors in this research agree that SDIs are important but there are many conditions required for the policy implementation rather than the indicator itself. So far there is no substitution for indicator as a tool for development achievement. The Head of Natural Resource Utilization Division, Ministry of Environment stated:

> "If there is a complementary tool of an indicator, it can be useful for controlling and comparing..... However, the usefulness of an indicator sometime correlate with the validity of the indicator which depends on computing system and mechanism behind that which make it trusted or not trusted. It supposed to be free from politic, except there is manipulation of the results."

However, this research tries to approach a "better" assessment to operationalise sustainable development by accommodating many inputs from many literatures in which existing similar assessments such as published by Statistics Indonesia (2009) have limitations due to not considering the indicator targets, while the second publication about regional performance index in 2010 purely used statistical process without considering expert opinion for the prioritized issues and lack of explanation about the relevance of the indicators. Similarly, Dashboard of Sustainability (DoS) lunched by United Nation is also lack of points above, -the target and statistical procedure-. The weakness of DoS is all indicators within one dashboard circle are given the same weight, i.e. they are equally weighted. Obviously, not all the issues portrayed by the indicators do have the same importance (IISD, 2007). Another problem as mentioned in The Dashboard Manual version 3 (2003) proposed by the DoS Constructor, many of the indicators used in DoS are experimental, new, untested, private initiatives, in short: less robust. However, in this research careful selection of the indicators has been done for higher degree of robustness.

CHAPTER 5. REGIONAL DIVERGENCE AND SYNERGISTIC DEVELOPMENT

The indicators as an approach of how Sustainable Development (SD) evaluated have been identified in the previous chapter by grouping them into three development dimensions (economy, social and environment). Then, the questions are: how is the position of a region towards SD according to those dimensions, are the regional divergence exist, are the dimensions seemed performing synergistically, are the policy biased identified, how should the policy be formulated if the biases and divergence exist. Therefore, this chapter illustrates two major issues; the first is the identification of sector by sector development achievement between regions as a mean to analyse regional convergence; the second part identifies development "balance" between three development pillars. Eventually, the policy recommendation can be formulated according to the performance. In that case, the analysis compares the expert opinions and the empirical data obtained from aggregation of indicator sets. This is a way to make qualitative and quantitative measure complemented each other as Scerri & James (2009) stated that integrating qualitative and quantitative approach is a suitable measure to capture the state of SD.

5.1. Regional Divergence: Sector by Sector Perspective

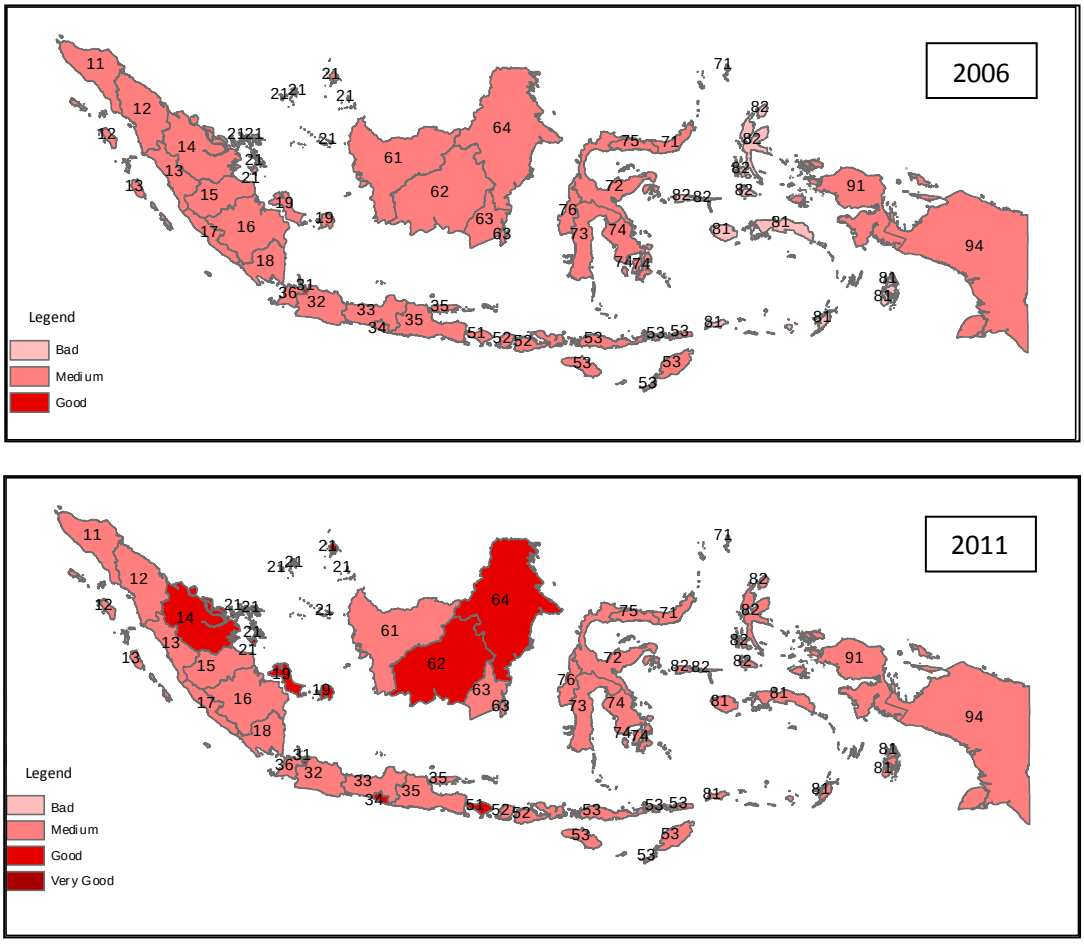
Balanced development is hard to be recognized because it has broader concept, not only synergistic development between sectors but also between regions, gender, races and other population groups. Regional disparities are a part of non synergistic development. Inequalities between regions show an inherent difference in natural resources, geographical location, infrastructure, economies of scale and agglomeration. The disparities are the main reason for the rapid urbanization of the Asian and Pacific region (United Nations, 2001).

Economic disparity in Indonesia has become the main concern of government. Reducing regional divergence and realizing national convergence is one of the targets of National Medium Term Development Planning 2010-2014. The strategy for reducing regional divergence is enhancing development of regions outside Java and Bali Islands, increasing connectivity, and accelerating development in the border zones.

According to the Head of Regional Economic and Social Analysis Division - National Development Planning Agency (BAPPENAS), regional economy and social tends to be more convergence now. But, an actor in Ministry of Environment has different argument:

> "Economic growth shows better performance, including GDP and inflation. But, the growth is unbalanced between regions, between lagging regions and developed regions, between Java Island and non Java Islands although government try to reduce disparities through Master Plan of Acceleration Economic Development (*Percepatan dan Perluasan Pembangunan Ekonomi Indonesia*-MP3EI) as a strategy to develop investment on 6 corridors in different islands-."

However, according to the empirical data, the trend of development divergence has been occurred both in term of economy and social. It can also be seen from the empirical data in the Figure 5.1-5.4 which categorize performance into five categories, 0-2 is very bad, 2.01-4 is bad, 4.01-6 is medium, 6.01-8 is good and 8.01-10 is very good (see also Sub-chapter 3.2). The categorization is only a way to group the province and make the divergence easy to be visualized in a map. The divergence itself can be identified through the number of group or legend.

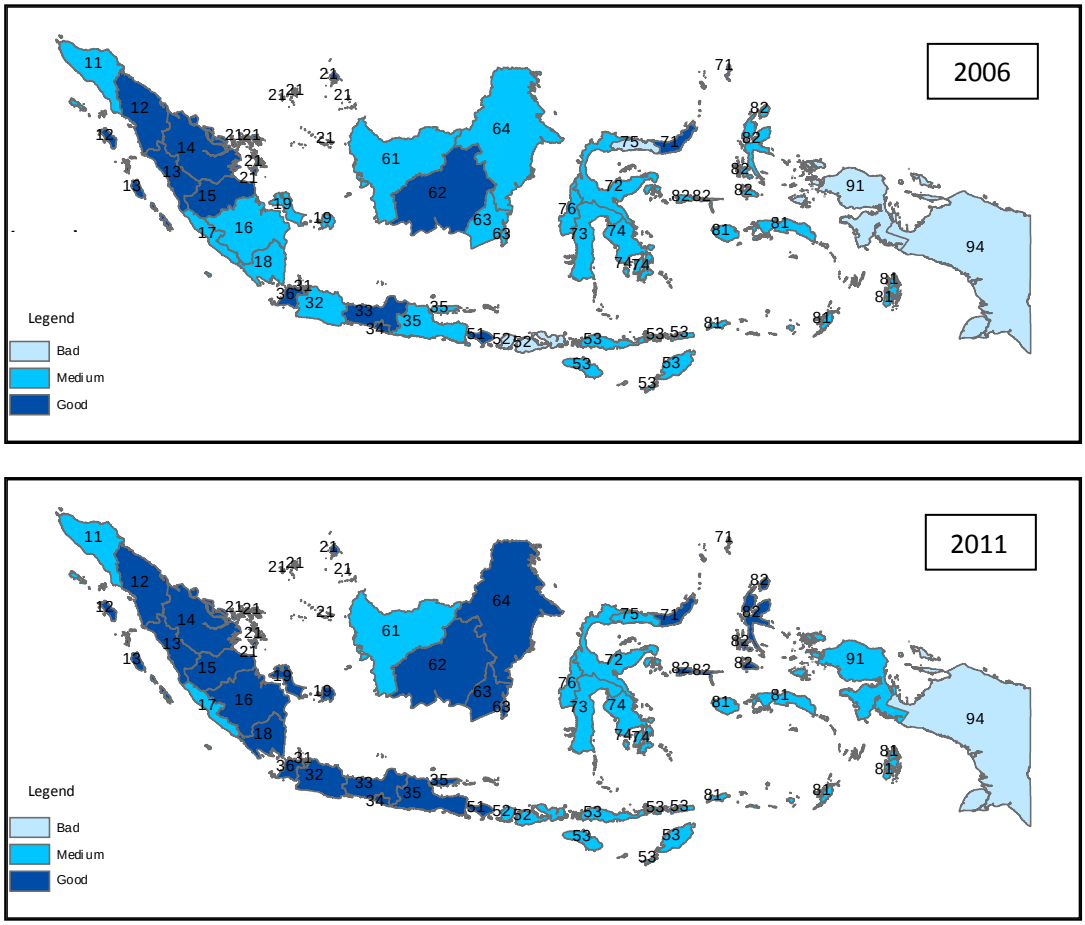


Note: The number shows the code of province (the explanation is in the appendix 4)

Figure 5.1. Economic Performance between Provinces, 2006 and 2011

During 5 year period the trend of economic performance has increased in the whole areas but still in the same category, except in 7 provinces having a significant increase to be more good performers. But, the general performance tends to be more unequal shown by the number of category in the legend of the map ranging from bad, medium and good, moreover in 2011 the inequality is more concrete in which the very good category is added, but the category only belong to few provinces, meaning that in general all province has the same state only certain outliers performing very good and bad.

However, in social dimension the divergence development is seen clearly between western and eastern part of Indonesia. Geographical location and the distance to the capital city and the most developed region (Java Island) are regarded as the causes of unbalanced social development. Besides, limited supporting systems such as infrastructures in transportation, Information, Technology and Communication (ITC) and energy are an impediment of social development in the eastern regions.



Note: The number shows the code of province (the explanation is in the appendix 4)

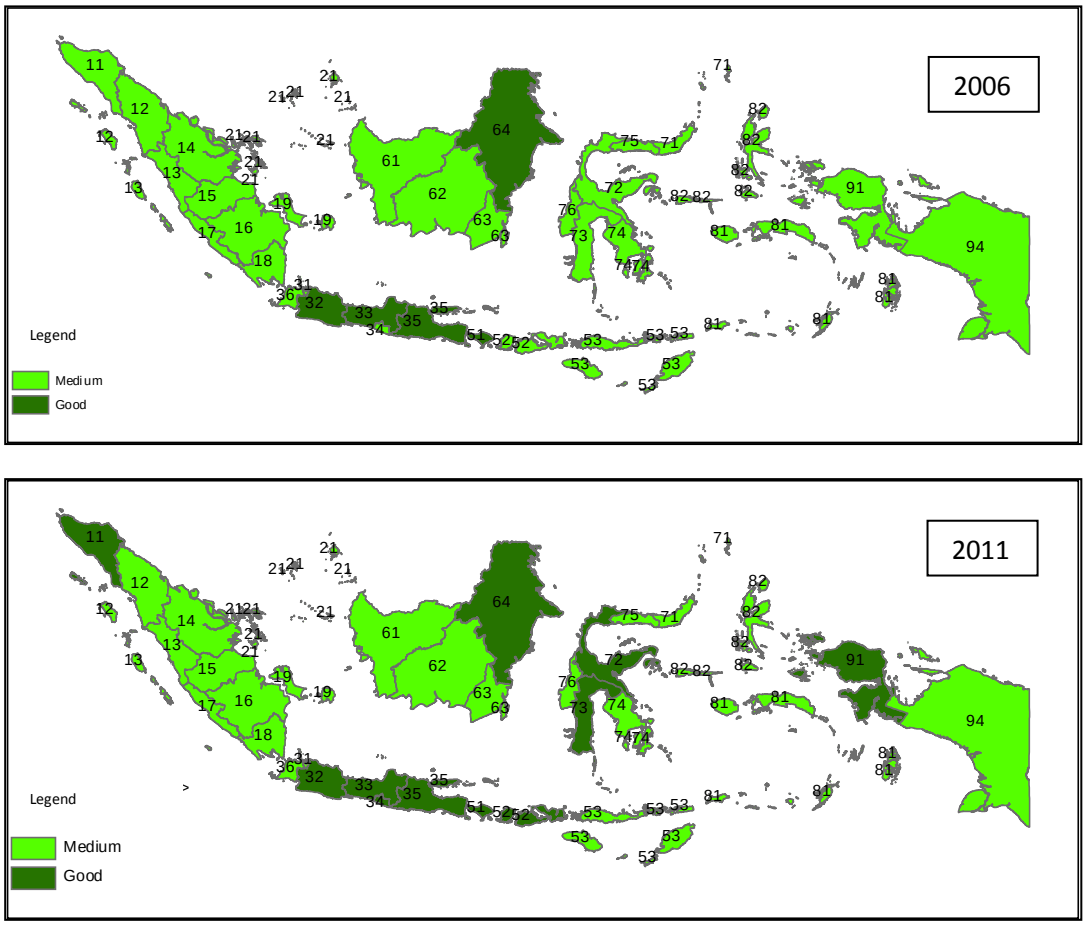
Figure 5.2. Social Performance between Provinces, 2006 and 2011

According to statistics, in the eastern part of Indonesia (Maluku, and Papua Islands) ratio of road length and total area is far smaller than other parts (Statistics Indonesia 2013b). In addition, electricity and internet access in these regions is far lower than national aggregate (Statistics-Indonesia, 2012b). Those are the evidence of lack infrastructure support system for increasing social welfare in the eastern part. Economic of scale might become a limiting factor for infrastructure investment because of geographical condition and lower population density. Especially in Papua having population density lower than 10 populations per km2 (Statistic-Indonesia, 2012b) is hard to make beneficial investment if economic of scale is low.

Meanwhile, the environmental conditions between regions tend to be equal which are mainly categorized as medium performance. The number of the legend is also a sign of more equal situation. Moreover, in 2011 better performance has occurred in many provinces. This is because of the increasing number of clean water accessibility which mainly related to the increasing service of pipe drinking water having filtration treatment and making the drinking water more safely to be consumed. Besides, the use of firewood as cooking fuel significantly decreasing also contributes to the better performance.

Unfortunately, the increasing CO2 emission and the increasing urbanization represented by the number of urban population have little contribution to the environmental index value since those indicators still in the range of ideal situation (see the Appendix 2 for maximum and minimum targets). Hence, those indicators did not decrease the overall performance. In addition, the capital stock of non renewable natural resources which is not calculable is not captured in this research, because this research utilises outcome and output indicators which are related to human effort or human intervention not the input ones which are naturally given. Therefore, if some input indicators such as the availability of ground water, minerals and renewable energy are considered in this research, the result might be different.

However, apart from limitation of the use of indicators, generally environmental aspect still performs better or arguably sufficient, but obviously management of environment still needs continuously improved. According to Munasinghe (1993), decision makers in most developing countries now accept that poor management of the environment has become a significant barrier to development. In that case, since sustainable development includes other long-standing, high priority objectives such as economic growth and poverty eradication, scarce resources (both natural and man-made) must be used as efficiently as possible.



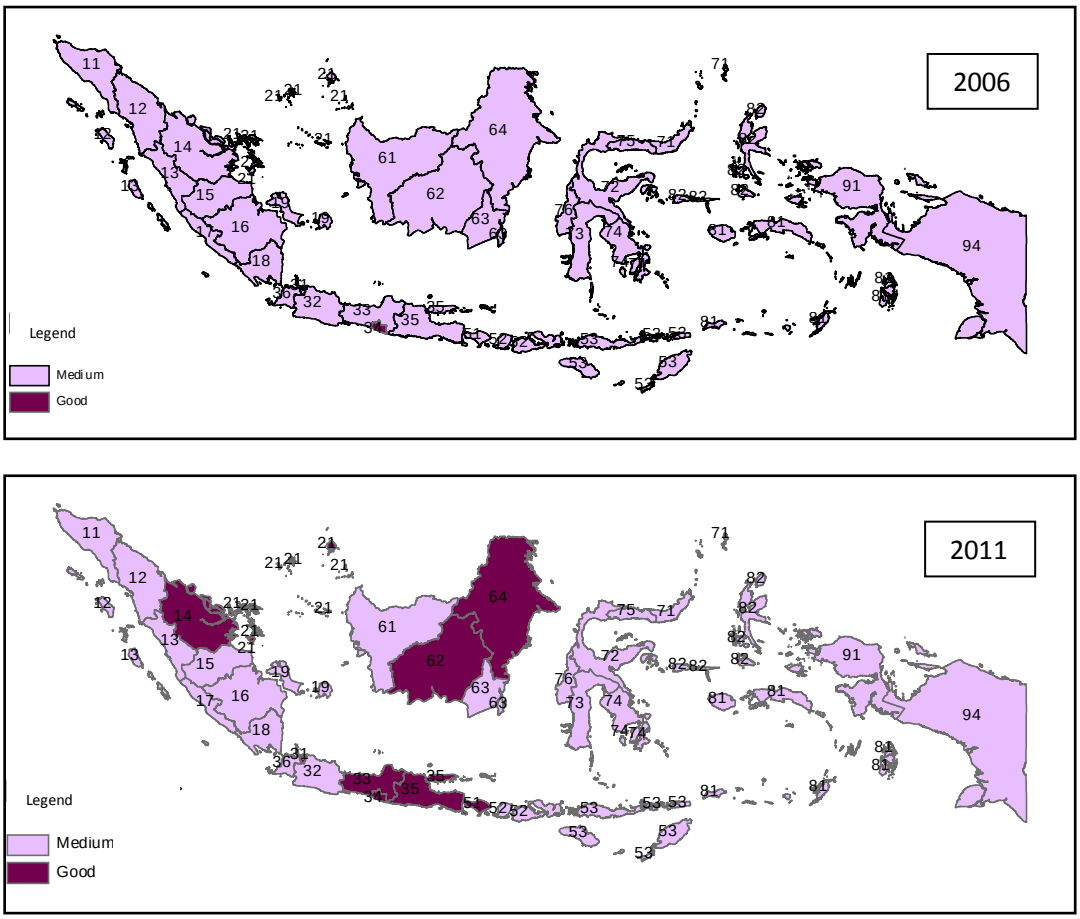
Note: The number shows the code of province (the explanation is in the appendix 4)

Figure 5.3. Environment Performance between Provinces, 2006 and 2011

However, it is also interesting to capture general performance comprising economy, social and environment simultaneously. In this case, the composite index called as Sustainable Development Index (SDI) is generated by assuming each development dimension has the same level of importance (equal weight). Thus, the SDI is the aggregate of all dimension performances (see also explanation in Sub-chapter 3.2).

From this quantitative measure (see Appendix 4 for more detailed vales and Figure 5.4 for the category of regions), two interesting notes are pointed out. Firstly, all provinces experience significant increase of SDI performance which mainly due to the economic increase giving higher contribution than the other two dimensions. Kepulauan Riau is the example province reaching the best achievement during the period of analysis which experienced significant escalation from 2006-2011 due to the rise of investment value. This situation leads to the better position of this province from the 8th position to the best performer. Secondly, from the Figure 5.4 below, during 5 year period Kepulauan Riau together with some other provinces, such as Riau, DKI Jakarta, Jawa Tengah, Jawa Timur,

Bali, Kalimantan Tengah and Kalimantan Timur increase the level performance becoming good performers which in 2006 it was only belongs to D.I Yogyakarta. Thirdly, the most important thing, the high achievement of SDI does not guarantee the fair distribution of the three development dimensions. Very clear example is seen in DKI Jakarta which always positioned in the best three performers during the period. But, there is unbalanced development between sectors (this part will be explained further in the next sub chapter). This unbalanced development is also visible in Kepulauan Riau, Jawa Tengah, Riau which are also the other good performers.



Note: The number shows the code of province (the explanation is in the appendix 4)

Figure 5.4. Sustainable Development Index (SDI) by Province, 2006 and 2011

Above all, actually the categorization of the province based on its performance shown in the figures just visualizes the positions of the region in the single fix range, meaning that there are several provinces which are positioned in the limit of range or precisely in the centre of the range. Thus, the analysis might be better to see the detailed values of each region as presented in the Appendix 4. The appendix also captures the rank of province performance compare to the others. This rank is beneficial to evaluate and motivate regional policy

makers to be more competitive to each other. In this case, punishment and reward can be initiated to motivate performing better.

Another conclusion, regional convergence analysis is meaningful if multi-dimensional issue is simultaneously analysed. Hence, the balanced dimensional developments and the relation between them are obviously important to see regional performance especially connected to sustainable development policy. Then, the next sub-chapter will identify the existence of unbalanced development between sectors and correlation between them.

5.2. Synergistic Performance of Three Development Pillars

Achieving a balance of all three development pillars is the ideal world of planning but practically serving the broader public interests by holistically harmonizing growth, preservation, and equality remains is narrowed by financial matters, authorities and bureaucracies (Campbell , 1996) or in short the situations of the regions under planning. This might be evident in Indonesia or even in the whole countries in the world. Therefore, this research uses empirical data and expert opinion to identify whether the synergy is absent or present in Indonesian context.

However, as scoped in the first chapter, synergistic relationship is captured based on the balance performance of three dimensions through statistical measure by comparing actual performances and the future targets in each development dimension. Thus, the speed and the comparative position of each aggregated performance can be identified as a signal of the degree of synergy. However, as a comparison, qualitative measure is also important to cross-check and to complement the empirical data by interviewing eight actors as mentioned in the chapter 3. Those qualitative and quantitative measures will be described in the sub-chapters below.

5.2.1. Synergistic Development Based on the Arguments

Sustainable Development (SD) becomes a new buzzword in development planning (Krueger & Gibbs, 2007), some countries then try to ratify Agenda 21 showing their concern on SD goals in which the environmental degradation started to be considered. In Indonesia itself, there is no precise time when Agenda 21 is started to be discussed. According to the interviewed actors, the environmental issues considered in development planning are identified in Medium Term National Development Planning 2014-2019. In addition, National Strategy on Reduction of Emission from Deforestation and Degradation (Stranas REDD+) is also evidence that environmental quality is considered on development planning. The publication of Sustainable Development Indicators (SDIs) itself was firstly published in 2004 as an indication of the need of SD assessment. However, another expert in National

Planning Agency stated that since UNFCC 2007 (United Nations Framework Convention on Climate Change) held in Bali concerning climate change, environment becomes an important issue by targeting 26% of emission reduction. From the arguments above, it can be said that the notion of SD has over the past 10 years been actualized in Indonesia by adding environmental goal in the development besides keeping economic growth and social welfare.

Practically, the sign of the additional goal is reflected on 4 development strategies: *pro growth, pro poor, pro job and pro environment* launched by Secretariat Cabinet of President Susilo Bambang Yudhoyono in 2007 while previously the strategy did not contain *pro environment* in 2005. It shows the growing effort of balancing development of those three pillars. But, according to the actors interviewed, the strategies are only a slogan. All actors stated that economic development is still a development mainstream. As stated by an expert on Urban and Regional Planning: "The existing development agenda is still *pro growth and pro job,* while *pro poor and pro environment* still don't experience significant change". The reason is, as various experts also indicate, that, in Indonesian context, maintaining the health of environment and ecological sustainability is not a priority, since there are many other problems have to be faced, keeping the people get enough food, clothes and shelter is the most logical goal at the moment. An expert on National Development Planning Agency commented that human welfare is still dominant focus which is related to income, growth and primary needs –food, clothes, shelters- because it directly affects to the human sustainability, while environmental protection does not necessarily directly increase human welfare. In addition, the argument of environment as a capital to use is certainly constructed in the parliaments and policy makers at the local levels as an actor in Statistics Indonesia stated "Environmental aspects is often seen as a capital not as a future investment".

The idea that nature is seen as a capital to be used is also evident from other sources the experts pointed at. For example, evidence of capitalist view is represented in the advertisement of Investment Coordinating Board (BKPM), one of national government agency, to attract investors. According to that advertisement of BKPM, Indonesia has abundant natural resources making it as a lucrative market for resource extraction, even more attractive than South Africa, Australia and Canada in terms of mineral prospect coopers. Besides, the country is a leading commodities exporter in a number of resources, including crude oil, natural gas, thermal coal, geothermal, palm oil, cocoa, tin, and rubber (Indonesia Investment Coordinating Board, 2013). In international level, Indonesia is the second largest home for biodiversity having 48 percent of forest area (Statistics-Indonesia, 2013b). Besides, the country is the largest exporter of palm oil and the largest rubber producer, the world's second largest exporter of thermal coal, the second largest producer of

tin and cocoa, and other abundant resources (Indonesia Investment Coordinating Board, 2013). The abundant resources is also shown in a proverb believed by Indonesian people "God creates seas as milk and grounds as food; everything can be grown there even a rock or a stick" showing the unlimited resources God gives to Indonesian land. This overwhelming-resource view might be true, in fact, Indonesia as an archipelago area having 1 910 931.32 Km2 area, 17 504 Islands with high production of fisheries and agriculture products (Statistics-Indonesia, 2013b) is a highly rich country for natural resources.

Indeed, such view might contribute to the lesser environment profile compare to economic issue which increases economic development goal as the priority. Hence, the greater focus on economic growth is seen as the culprit of environmental degradation. For example, increasing city attractiveness pointed to enlarge infrastructure has threatened ecosystem balance, as an actor in Ministry of Environment stated:

> "Degradation and deterioration have been severe during the last decade. It is shown by land use changes from agriculture and forest area to the city enlargement. Consequently, some indicators of environmental quality show the threats of ecosystem health and its balance".

Next to a relative underrepresentation of environmental aspects, also the focus on social aspects tends to be problematic compared with the economic. Higher disparities as a consequence of occupancy of economic activities by only certain people might happen because the source of growth mainly comes from high investment activities occupied by those few people. As evidence of this, although economic growth continuously increases almost 7 percent yearly during recent period (Statistics-Indonesia, 2013b) disparities are also higher than the previous ones. In this case, Head of Natural Resource Utilization Sub-Division, Ministry of Environment explained:

> "Poverty alleviation is always a resonant topic on development agenda. Government announced the number of decreased poverty from 34.01 million in 1997 to 28.59 in 2012. But, the fact shows that the inequality assessed by Gini Index has increased. According to Statistics Gini Index in 1997 was 0.35, while in 2012 becomes 0.41. It means that economic activities have been dominated by only few people. On the other hand, unemployment rate in 1997 is 4.18 million people (4.68%), while in 2012 the number is 7.17 million people (5.92%), showing an increase. It is a consequence of low awareness of government to the issues of job opportunity enforcement especially for the poor."

The arguments above, focussing on the relation between economy, social and environmental aspects, represent the existence of disparities -unbalanced development- between three pillars. The first is disparity between economy and environment and the second between economy and social. This unbalanced development, as the interviews reveal, is considered to be partly caused due to the result of decentralization happened since 2001 and after Suharto regimes fallen in 1998. An actor in Ministry of Environment stated that after Suharto era

(1998) agriculture which previously as a leading sector has not been prioritized anymore, the government gives more focus on industrialization which is more market intention. Consequently, she continuously stated, the economic development affects too much exploitation on natural resources and ceases the agricultural sector which is mainly as livelihood of majority population.

In the shift of centralized to decentralized, most of the administration affairs, including the spatial planning, have been transferred from the central government to the provincial and the local level (kabupaten/kota) (Hudalah & Woltjer, 2007). Hence, locals have authority to manage their resources including financial and natural capital. Consequently, uncontrollable exploitation of natural resource emerges as an expert in Ministry of Environment stated that thousands development permits such as mining exploration and certain plantation activities increasingly emerge after decentralization as a mean to competitively reach high revenue. On the other hand, the impact of decentralization strengthened by political system contributes to the high degree of environmental degradation as an expert on forest management stated:

> "The impact of decentralization and political system (direct elections) causes competition of governor candidates to pursue financial support from privates by offering mining activity permits or Industrial Forest Plantation (HTI) activities which obviously threaten ecological sustainability"

But, then he explained not all regions seem having the same behaviour. For example, local governments in Malinau, Kapuas Hulu and several municipalities already consider environmental impact for the future. In this case, he suggested sticks and carrots mechanism by for example the central government. Giving an incentive to those municipalities maintaining the environmental health and reducing severe exploitation is obviously important.

On the other hand, there is also a risk of efforts to protect the environment, because it might lead to slower economic growth exacerbating the inequalities between rich and poor regions (Campbell, 1996). This is a reason why Campbell (1996) also argues that economic growth, environment protection and social justice cannot exist alone, the nature of the three axial pillars is mutual dependence based not only on opposition, but also on collaboration or complement. This argument is also supported by an expert on forest management who stated:

> "In the first phase, economic development might degrade environment but along with the increasing of social welfare and quality of human life, the importance of environment protection will be more considered to create better environment as described on Kuznets Curve."

It provides an argument in support of the current focus in the Indonesian context on economic sustainability -maintaining high production of goods and services, developing infrastructures, increasing purchasing power, accumulating assets and investments-. Increasing and accumulating investments is a capital to enhance quality of human welfare and protect the environment. Thus, according to the actor statement above, the curve of environment degradation increases in the first phase but then decreases along with the economic and human quality growth. This idea is also regarded as potential complementarily of interests of development triangle (Campbell, 1996).

To sum up, according to expert opinions above the synergistic development between three development pillars is still utopia because existing goal of development still prioritizes economy. It is logical because the problems faced by Indonesia as developing country is complicated, not only in terms of environment but also more importantly human quality. Therefore, economy is often used as the source to increase human welfare, while environment is still believed as abundantly and naturally given as described above. In term of human welfare, according to Human Development Report 2013, Human Development Index (HDI) of Indonesia is ranked in the position of 121 out of 186, lagging behind from neighbour countries such as Singapore (rank 18), Brunei Darussalam (rank 30), Malaysia (rank 64), Thailand (rank 103), and Philippines (rank 114) (UNDP, 2013). It shows human quality issues have to be prioritized, in which economy can be used as the capital to enhance the quality.

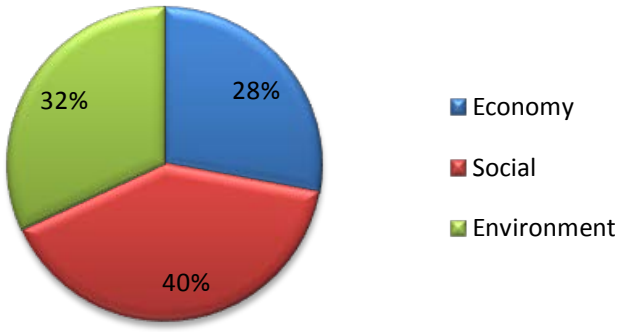
5.2.2. Synergistic Development Based on the Facts

Although the concept of SD requires equal triangle, the "mother concept" of SD is environment, as Lafferty and Hovden (2003) stated that based on a close textual analysis of the Brundtland Report the SD concept is attributed 'principled priority' to environmental objectives in the process of 'balancing' economic, social and environmental concerns. But, as mentioned previously, in Indonesian context environment aspect is still seen as an abundant capital. Meanwhile, as the actors stated, currently, economic sustainability still becomes a development mainstream. Therefore, the prioritized development direction should be more focused on social. It can be seen in the result of interview, in which the aggregated weight of social aspect attached to each of the three pillars by the experts together is 40%, while the weight of environment and economy are 32% and 28% respectively (Figure 5.5).

But, the opinion is quite subjective because the interviewed actors mainly come from national agencies living in the capital city in which the economic performance is not questionable. Also, when reviewing the answers as discussed in section 5.2.1, they might just assume the economic growth remains and other aspects need to be connected to it. Perhaps,

other actors or policy makers in the local level having bad performance in economy might give different perspectives. Hence, it is important to analyse the development balance in regional level to identify which dimension has to be prioritized because the situation and the problem faced between regions might be different, as an actor in Ministry of Environment stated: "Sustainable Development Goals can be reached if the condition and problems faced by the micro levels are considered." In addition, SD is a multiplicity concept because each community and region develops a system based upon their own circumstances and needs (Innes & Booher, 2000). Therefore, different region might have different prioritized goal. The identification of the prioritized issues and development balance in regional contexts can be identified by utilising empirical data to acknowledge which development goal has been achieved or well perform and which dimension needs to be stimulated.

Figure 5.5. Prioritized development direction according to expert opinion



According to the quantitative results by utilising data of indicators in the chapter 4, in Indonesian regional context, the balance performance happens for only some regions and the level of balance is quite diverse. The identification of balanced performance is represented by the area wide of triangles and the value of each dimensional performance. The more equal triangle the more balanced development and the wider triangle edge the closer of performance to the aggregated target or goal.

As a general result, during five year period of analysis as seen in Figure 5.6, in 2011 the overall performance (Indonesia performance) tends to be more equal; the performance of economy significantly increases while social and environment experience little improvement; Meaning that overall growth seems to be more focussed on the economy and in a lesser degree on the environment, while socially hardly any growth was visible. It can also be seen from calculation on Appendix 4 in which on the average, economic index was lower than social and environment, 4.70 compared to 5.57 and 5.53 in 2006. Then, in 2011 economic performance increase significantly becomes 5.72, while the two others increased slowly. It

means that balanced development has been achieved in 2011 in general but with this ongoing trends the unbalanced development will be exist in the future since the speed of growth of the development performance between the three is unequal. Thus, a tendency to become unbalanced might happen again in the future if economic growth continuously becomes a development mainstream.

Figure 5.6. Performance of three development pillars in total

The similar patterns in the regional context can be seen in this compared figures in which the balance development performs in Bali and Sulawesi Barat, as the examples. Bali in 2006 had balance performance between environment and social, and then five years later the equal performance has been achieved for the three development pillars after economic development increasing. Almost similarly, Sulawesi Barat experienced the same pattern, but the level of performance is lesser than Bali seen on the wide of triangles.

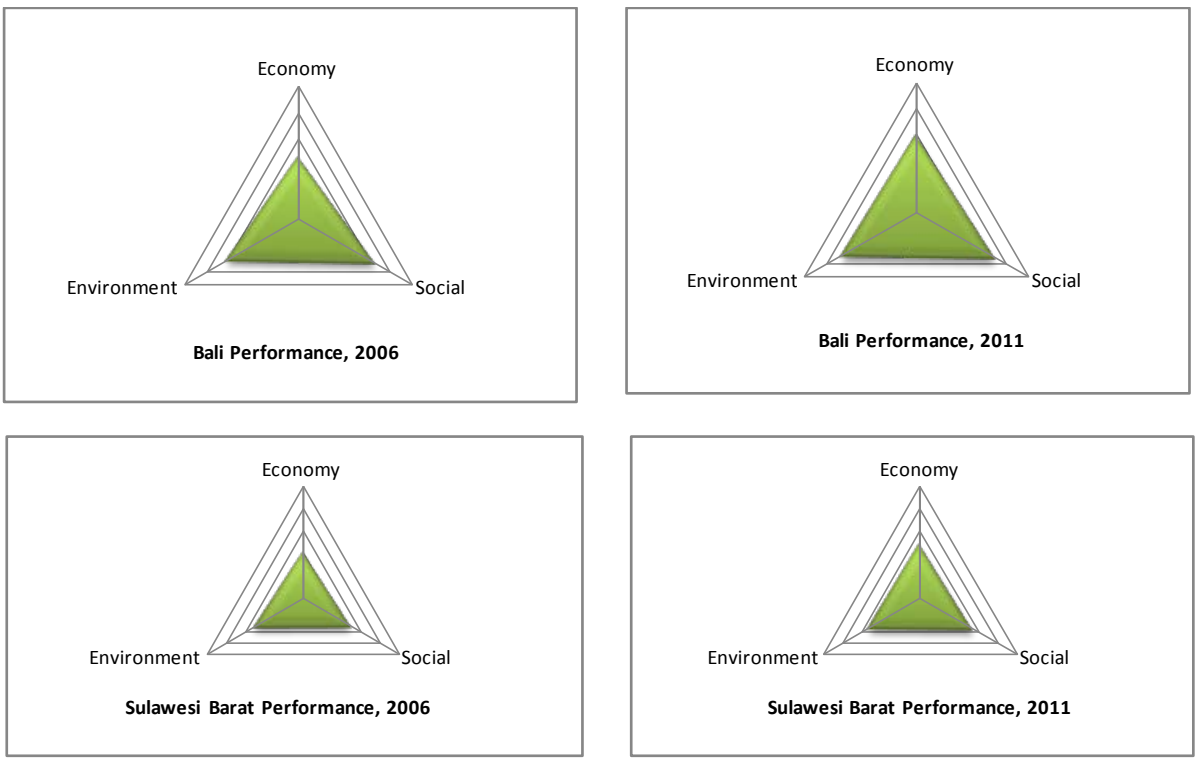


Figure 5.7 Compared development performance between Bali and Sulawesi Barat

However, the unbalanced development occurs in other regions and extremely happens in some outliers, for example DKI Jakarta, Nusa Tenggara Barat (NTB) and Papua. DKI Jakarta experiences highly unbalanced development. Its economic and social aspect is seemed performing in the same level but far higher than environmental conditions. This is because DKI Jakarta faces many environmental problems as the impact of high urbanisation influencing pollution. Its population density also contributes to the limited green space and wet land areas. Those circumstances are very far from the high increase of economic and social development, even in 2011 the economic and social achievements almost reach 8 (the second line of the target) while the environment aspect is still lagging behind in the point 4.

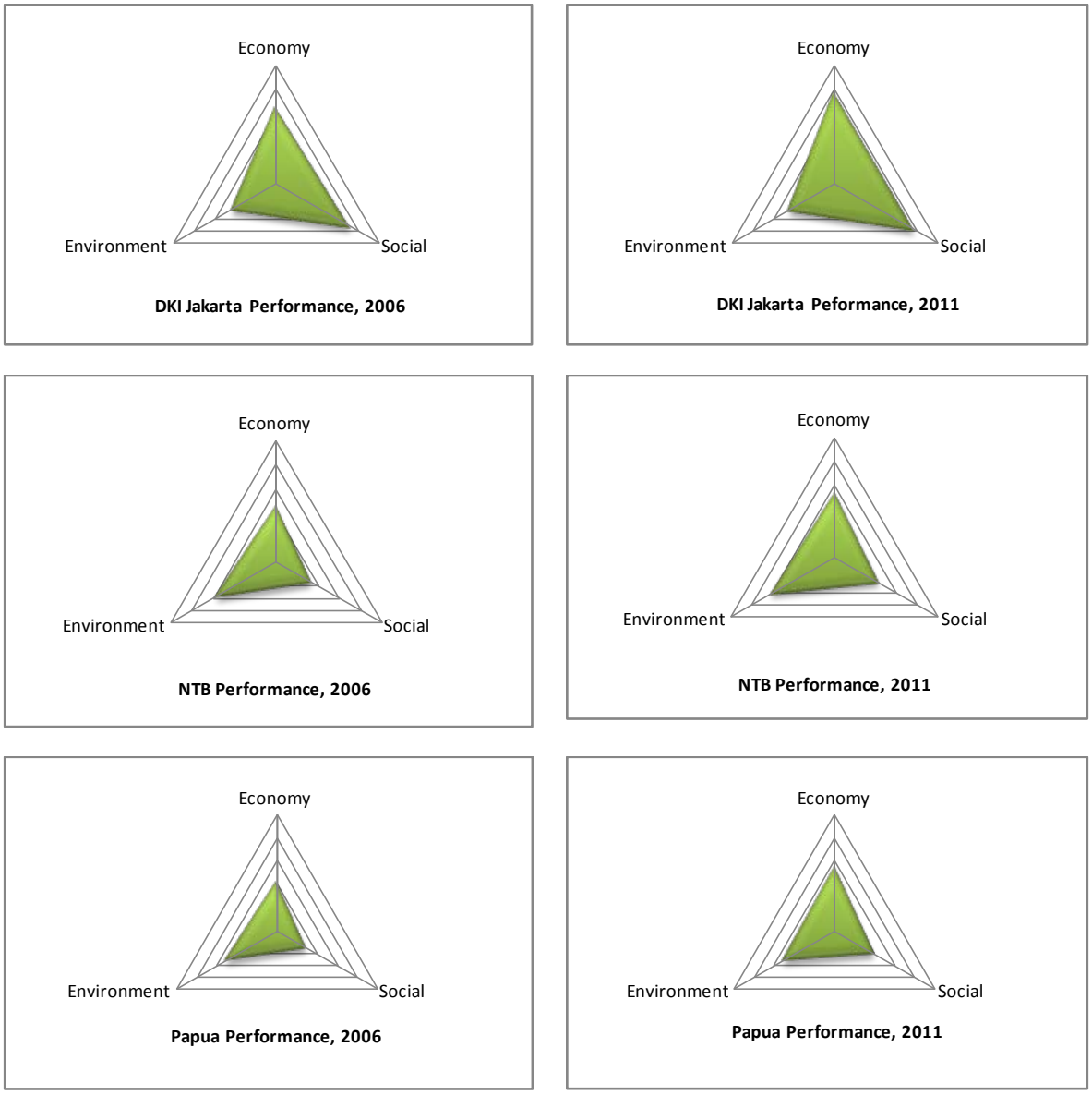


Figure 5.8. Performance of three development pillars in the example regions

In contrast, the performance of Papua and Nusa Tenggara Barat (NTB) tended to be better on environment condition, but the social aspect still needs efforts to push education attainment, and reduce inequality of income and gender issues. Meanwhile, in NTB health status still becomes a big problem beside the others –poverty, crime, education and inequality-. This is in accordance with the achievement of HDI. According to Statistics Indonesia (2013a) since the last two decades, NTB and Papua always become the worst performers; in contrast, DKI Jakarta is always in the first place. However, the figure of other provinces can be seen on the Appendix 3.

In short, there are three categories of province by looking at directly Appendix 3 and Appendix 4 and comparing situation in 2006 and 2011: (1) more balance with little degree of achievement; (2). more balance with high degree of achievement; (3) almost in similar situation or unbalanced with various degree of unbalanced. Nusa Tenggara Timur, Sulawesi Barat are in the category 1 because it tends to slowly balancing its development although level of achievement is still lower than the others. Kalimantan Timur and Bali are the example of the regions with category 2 which visibly reach equal triangle with the high performances. Meanwhile, the others are mainly categorized in group 3. The outliers in the Figure 5.8 (DKI Jakarta, NTB and Papua) are the example of provinces categorized in this group because of still experiencing unbalanced development although the overall index increasing.

Important to note, the more balanced situation in the analysed regions is mainly due to the significant increase of economic performance while social and environment only experience gradual change. It strongly proves the expert arguments that government policies mainly focus on economy. It also reflects that the 'balanced' situation purposed in this research which is pointed to the development targets is influenced by the acceleration of economic development programs attached to the existing government policies. It also means that if these economic policies are continuously strengthened such as MP3EI (master plan of acceleration and expansion of economic development) launched in Presidential Regulation no. 32/2011, the unbalanced situation will obviously re-occur or even get worse than the situation before 2006. This is what of an interviewed actor of NGO worried about. He stated that the master plan will significantly affect environmental degradation in many places. It additionally supports the hypothesis that the future figures will be again unbalanced.

5.2.3. Correlation of the Triangle Edges

The increasing trend in over all dimensions among regions shown by SDI represents better situation although it might not be a sign of more balanced development since the speed of growth is different in which economic dimension is achieving the golden age during the

period. Then, it is interesting to analyse whether the increase of economic achievement significantly correlate with the increase of environment and social performance. In this case, a statistical method, Pearson Correlation Test is helping to point out the situation. The explanation of this method is represented in the Chapter 3.

Based on the results (Appendix 5) the economic performance is correlated with social achievement with the positive tendency, meaning that the increase of economic situation leads to the better social achievement. But unfortunately, it does not contribute to the better environmental situation since environment experienced little increase. And so does the correlation between social and environment which is not significant.

From the situation above, the natural complementarily relation between three development pillars (Campbell, 1996) is only attached between economic and social aspect. It partly supports the actor argument above that the mainstreaming economic development is the source for enhancing other developments. The Kuznet curve as also pointed above has not been achieved so far. Moreover, by looking at the ongoing trend -unbalanced in 2006 and more balanced in 2011- future trend might become unbalanced again by seeing the more significant increase of economy making other development lagging behind.

In short, making development aspect complementarily is not an easy attempt if the growth speed of one aspect compared to the others is far higher. Instead of support each others, the different acceleration of economic growth might lead to the more unbalanced development, especially to the worsening situation of the environment. Although it is evident that growing economic aspect leads to the better social situations, the Kuznet Curve cannot be guaranteed to be realized in Indonesian context. Environmental aspect might become continuously a weak profile. It is proven by the correlation value between economy and environment which continuously experience increasing negative value (Appendix 5), meaning that the increase of economic index during 2006-2011 leads to the decreasing environmental index despite in the low level of significance.

5.3. Policy Orientation

Empirical data shows that development achievement of three development pillars might represent 'balance' development in only some cases. And, better economic performance does not lead to the better social and environmental condition. The qualitative result also shows the indication of non synergistic development between three pillars. Besides, regional performance analysis also indicates some inequalities of development achievement between regions. Thus, integrating policy between sector and region is important to reduce non-synergistic development.

This is not an easy task to perform although there is an effort of government to integrate policy. Integration is hard to be realized since there are many prioritized problems to be solved, because integration literally can occur with no priority (in effect, equal priority) of different parts or with differentiated priority (Persson, 2004). But, the problems and priorities are various across regions as mentioned previously. Sometimes, the priorities are paradoxal. For example, MP3EI (Master Plan for the Acceleration and Expansion of Indonesian Economic Development) tries to enhance governance by involving private sectors and strengthening coordination among related ministries and regional government. In that case, regional disparities are the pointed problem to be solved in which the coordination between sectors, between regions and between government-private sectors is stimulated. But, according to expert on environmental NGO as the government watchdog, this master plan might enhance governance by involving cross-level, cross-sector, and private-public coordination, but environmental aspect will be still a weak profile because economy is still the priority. Indeed, Underdal integration criteria -comprehensiveness, inclusiveness, consistency and aggregation- in Persson (2004) are normative concepts to be implemented in Indonesian context, because the dilemma between reducing regional economic-social disparities as a priority and environmental protection as the mother concept of SD is unavoidable.

In addition, there is also a problem to integrate policy. According to an expert in Ministry of Environment, in Indonesia integrating three development pillar policy is already discussed on National Medium Term Development Planning (RPJM) but the translation on the strategy is the authority of each development agencies that have own strategy and planning. Thus, there is a lacking practice. Indeed, it needs monitoring and evaluation on the implementation in which rewards and punishments can be a tool to keep implementation on the track.

Another problem, policy integration is still utopia because there is a major culprit – decentralization- as expert on urban and regional planning stated:

> "The implementation of decentralization has to be evaluated. In this case, the implementation of decentralization suppose to be until regional (provincial) level not until municipal level in order to integrate policy and plan toward sustainable development"

Beside, ego centralistic of sector and region and strong influence of political party, obviously makes integration hard to be realized according to the argument of a policy maker in BAPPENAS, he stated "Planning formulated in the national level becomes blurred in the local implementation due to the politic". In Indonesian context as the impact of direct election of governor and parliaments, the policy is not pointed to increase human welfare

and public inspiration anymore but more focused on party interest as an expert of population studies argued. Thus, integration requires the 'penetration' of large parts of the political machinery throughout the entire policy cycle with a fundamental and yet unspecific norm (Jordan & Lenschow, 2010).

Fundamental change which related to dependency is also required to integrate policy in Indonesian context. An actor of NGO stated that dependency of the south to the north countries has to be minimized. He gave an example of ecological modernization as a new discourse to integrate economic and environmental policy. In his opinion, ecological modernization is hard to be realized if the political matters and foreign interventions (economic dependency) still exist, for example the idea of renewable energy development proposed by the US might represent as a way of maintaining environment by still keeping economic on growth. But, he argued that it is political since The US brings the environmental issue as a background but there is an economic target behind -increasing dependency of Indonesia to that country, and maintaining the economic growth of the country-. Another intervention that the expert concerned is the production of environmentally-friendly car which is exaggerated as a solution for environmental problems, but it still exploits tin in Kepulauan Bangka. The foreign car producer will get economic benefit, but tin exploitation in Indonesia might become severe, he continuously stated. This vested interest will always be the limitation of ecological modernisation.

Besides less dependency Indonesia to the north countries, the second requirement to integrate policy in Indonesia according to NGO actor is consistency which is also a part of Underdal integration criteria in Persson (2004). He stated:

> "Even governments tended to consider environment, there is always inconsistency of their policy....growing 1 billion trees but giving forest exploitation permits higher than the number, reducing CO2 emission but allowing a big number of imported car expansion, increasing green residential developments but dragging slum area of poor people as happened in Pantai Indah Kapuk."

From the statement above, the consistency criterion involves two dimensions. Vertical consistency means that a policy should be consistent at all its levels -the consistency between policy formulated in the national and regional, even local and consistency between policy goals and detailed guidelines-. This vertical consistency is not represented in the case of reforestation (tree plantation) and CO2 emission alleviation as the actor argued above. Meanwhile, horizontal consistency means that the same policy is pursued by all actors at a given policy level and in relation to a given issue as represented in the case of green residential developments above.

Besides, the integration also requires the existence of independent department, as an actor in BAPPENAS suggested that "there should be a department or ministry who accountably responsible for integrating policy because so far the policy is sector by sector and sometimes antagonistic each others". And, greater policy integration does often require political leadership from above as Jordan & Lenschow (2010) stated.

However, policy integration is a panacea for non-synergistic development, but it is not everything. More integration is not always better than less integration. It is context dependent depending on prioritized development in the micro levels and the capacity of local governments especially in the decentralization era. It needs requirements as stated above.

In conclusion, creating synergistic development and reducing regional divergence are not easy if priority is diverse. Integrating policy then, becomes a hard task to do. Priority or weighting is a key element which is absent from the literal definition of policy integration (Persson, 2004) making it is hard to be realized in Indonesia. Then, the most doable attempt is each region has to focus on the weaker achievement as this research analysed. For example, DKI Jakarta has greater focus on economy and social while environment is lagging behind, thus future policy has to be more focus on environment which is continuously severe. Meanwhile, NTB has to be more concerned on social improvement, especially increasing health and education services. In this case, central government can give more social financial aid to this region since decentralization might not be sufficient to cover it.

Then, above all it would be better if the implementation of decentralization and political system such as direct election is evaluated since those aspects are arguably as the culprits of unbalanced development in Indonesia. Decentralization, however, would be more beneficial if it is only applied until regional (provincial level) than local or municipal level. Local authorities might be constrained in their willingness and ability to perform decentralized tasks (Zuidema, 2013). The capacity of local is hindered by the limitation of knowledge and human resources as an actor of urban and regional planning stated. Increasing capacity of local government is obviously important. In addition, institutional and financial assistances from the government are also needed in order to promote equality and to reduce disparity in the society in the practice of decentralization (Hudalah & Woltjer, 2007).

Political system relying on political party in the name of democratization via direct election has also to be evaluated. Since political party has greater influence on planning system, money politics and corruptions increase significantly making the planning implementation bends to the party interest (Mutiarin, et al, 2011). In that case, non-synergistic development and regional disparities might continuously concrete if direct election is still held out. Surely, radical change on the political system and decentralization practice is needed.

CHAPTER 6. CONCLUSION

Realizing Sustainable Development (SD) goals in Indonesia is more complicated because of some reasons: political system, big population number, wide archipelago area, social-welfare, etc. Besides, the variety of problems faced by each region is also hindrance to make three development pillars –economy, social and environment- working synergistically. In the evaluation side, it is also important to assess the position of a region towards SD; hence SD Indicators (SDIs) have to be formulated as an approach to measure the state of sustainability.

Then, as the first chapter explained, this research aims to (1) identify appropriate indicators of sustainability in Indonesia on a regional level, (2) analyse regional performance toward sustainable development in three development pillars, (3) analyse the degree of synergy of each sustainable development dimension, and (4) formulate policy recommendation if development of three pillars is not working synergistically. This concluding chapter is then divided into three parts; the first is the concluding findings based on the research objectives, except the last objective; the second is concluding statements; while the last part is recommendation. The last objective of the research is a part of recommendation.

6.1. Conclusion and Reflection to the Conceptual Framework

The first objective of this research is identifying appropriate Sustainable Development Indicators (SDIs). It is not an easy task to select appropriate SDIs because many requirements have to be fulfilled (Hatry *et al*, 1977 in Hemphill et al, 2004; Peterson (1997) in Hezri & Dovers, 2006; Briassoulis, 2001; Mitchell, 1996; Pinter, et al, 2012; Scerri & James, 2009; Dahl, 2012; Lancker and Nijkamp (2000) in Singh, et al, 2012; Bossel, 1999), see Sub-chapter 2.3. Hence, the selected indicators in this research should reflect the notion of sustainability in three dimensions by comparing to the notion of sustainability according to many literatures. And, they should also fulfil the requirements including the usefulness or the linkage to the policy. Thus, the work is a combination between scientific and pragmatic choices, since the availability of the data; the concept and the method also have to be considered to match to the conceptual framework. As a result, the appropriate indicators for SD have been selected which are related to: economic structure, unemployment and investment, poverty, health, education, gender equality and security, issue in water, air (green house gases), land, and urbanisation. Most of the selected indicators are resonant because they are also a part of government development agenda.

Reflecting to the conceptual framework of SD indicators (SDIs) in Chapter 2, the selected indicators fulfil some of its requirements. The formulation of the targets as the heart of how to achieve the SD goals (Pinter, et al, 2012; Briassoulis, 2001; Lancker and Nijkamp (2000) in Singh, et al, 2012) is generated by elaborating long-term, medium-term development planning and other country experiences. The governance behind its construction (Hezri & Dovers, 2006; Reed, et al, 2006) is approached through considering expert opinion from different expertises by asking the relative importance of the SDIs. The compactness of the indicator (Bossel, 1999) has been done through careful selection of resonant indicators. The consideration of gathering multi-dimensional issues (Briassoulis, 2001) have been done reflected by group the indicators. And, the transitions and dynamic situations (Briassoulis, 2001; Dahl, 2012; Mitchell, 1996) attached to the sustainability indication is observed through the use of two indicator time frames, 2006 and 2011. Unfortunately, another requirement -the usefulness of the indicators to the policy- is still questionable. It needs strong effort to make them more resonant for the policy determination.

The second objective is analysing regional performance toward SD. This research reveals some notes. **Firstly**, social-economic performance tends to be unequal during 2006-2011. Importantly, the divergence development in social dimension is seen clearly between western and eastern part of Indonesia. Geographical location and the distance to the capital city and the most developed region (Java Island) are regarded as the causes of unbalanced social development. Meanwhile, the environmental conditions between regions tend to be equal which are mainly categorized as medium performance.

Secondly, the aggregate performance of three development pillars shown by the composite indicator -Sustainable Development Index (SDI)- represents better performance indicated by the increasing trend of SDI. But, some of the best performances do not represent fair distribution of dimensional achievement. It is a sign of unbalanced development although general performance shows an improvement.

Thirdly, also related to *the third objective - identifying non synergistic development between three pillars*-, development achievement of the three pillars represents relatively more 'balance' development in some regions during 2011 compared to 2006. However, in some outlier cases, unbalanced development is clearly seen. DKI Jakarta performance shows the evident example.

Fourthly, trend analysis shows that during 2006-2011, more balanced development is visible but future trend can be predicted unbalanced again due to the higher speed of growth of economy compared to the social and environment achievement. Reflecting to Koglin (2009) argument, instead of regulating and planning for a sustainable society, the development in recent years has been towards more market and more growth, which clearly

stands in contradiction to the social and ecological aspects of sustainability. It is in accordance with Nugroho (2012) and Khudori (2012) argument that Indonesian Government can only force the economic growth without increasing equality or welfare.

The interview result also shows the indication of non synergistic development between three pillars due to economic growth as existing development mainstream. The logic is that, problems faced by Indonesia as developing country is complicated, not only in terms of environment but also more importantly human quality. Therefore, economy is often used as the source to increase human welfare, while environment is still believed as abundantly and naturally given. In this case, economy can be used as the capital to enhance the quality, by assuming that Campbell (1996) argument is true that the nature of the three axial pillars is mutual dependence.

Lastly, highlighting the correlation between the three pillars, it seems that economic development positively correlate with social but not correlate with environment. Reflected to the conceptual framework, Campbell (1996) stated that the SD triangle edges cannot exist alone, the nature of the three axial pillars is mutual dependence based not only on opposition, but also on collaboration or complement. In this case, the research emphasizes that the general picture of Indonesian context, the complementarily relation between sustainable development triangle edges only happens between economy and social while economy and environment seems conflicting. And, the relation between social and environment is not visible.

6.2. Concluding Statements

As described in the empirical analysis, some concepts emerging in the academic literatures have been revealed in this research. Some of them are convincingly accepted while others are doubted in Indonesian context. **Firstly**, the multiplicity concepts of reaching SD goals (Innes & Booher, 2000) are clearly seen since different region has different performance showing the existence of weak goal and strong goal. It is also reflected by the prioritized goals that actors conceptualized. Although the mother concept of SD is ecological sustainability (Lafferty and Hovden, 2003), but some Indonesian regions still have a lot of homework to increase human welfare. On the other hand, different regions need different prioritized goals.

Secondly, related to the prioritized goals, policy integration or the like such as Environmental Policy Integration (EPI) is hard to be applied in Indonesian context because, the term of integration seems only requiring equal interests or 'no more important priority'. This is why this research argues that policy integration is a panacea for non-synergistic development, but it is not everything. More integration is not always better than less

integration. It is context dependent depending on prioritized development in the micro levels and so does the capacity of the locals and political system. Besides, power struggles in government and between departments are the hindrances (Jordan & Lenschow, 2010) as the actors pointed in Chapter 5.

Thirdly, the natural relation between triangle edges of SD (Campbell, 1996) has been proven complementarily between economy and social, and there is a tendency of conflicting between economy and environment although it is slightly visible. It means that Campbell (1996) argument about the existence of those relations is proven in some cases. But, it needs further research which can capture the more detailed figure.

6.3. Recommendation

6.3.1. Policy Recommendation

The existence of unbalance development, non synergistic development between development dimensions and regions needs policy integration. Although it is hard to be applied due to different development priority among regions, the integration supports the SD goals which comprise the balance development between sectors.

Reflecting to the conceptual framework, Environmental Policy Integration (EPI) or any kind of other policy integrations is beneficial to harmonize the interaction between three dimensions (Tanguay, *et al*, 2010). In this case, Underdal (1980) in Lafferty & Hovden (2003) points out three criteria needed to be satisfied: comprehensiveness, aggregation, and consistency. But, policy integration has to acknowledge the priority of the region which seems absent from those criteria.

In Indonesian context, referring to the existing circumstances there are many requirements to support policy integration. Creating consistent policy, limiting dependency, evaluating decentralisation practices and political system, increasing local government capacity are the obvious requirement to get higher degree of integration.

Above all, reaching balanced development in Indonesia is hardy achieved because of complexity. The problems faced itself are complex shown by interrelated case between economy, social and environment, not only conflicting but also complementarily. The policy making is also complex due to different actors and perspectives need to be dealt with, especially in the practice of decentralization discussed previously. Therefore, the orientation of actions needs the practice of governance collaborating multi-level, multi-sector and multi-actors. In this case, transition management is needed to radically change current practices hindered the synergistic development policies.

6.3.2. Research Recommendation

This research has a “better” assessment to operationalise SD compare to the existing similar assessments in Indonesia such as Regional Development Index (Statistics-Indonesia, 2009 and Statistics-Indonesia, 2010) which has limitations in term of conceptual framework. The research also has improvement in the methodology which procedurally follows the rule of statistics compare to the same assessment such as Dashboard of Sustainability (DoS) lunched by United Nation (IISD, 2007) which is lack in methodology. Unfortunately, this research also has some limitations and need further improvements.

Firstly, selecting appropriate indicators is the hardest part to acknowledge the state of SD since this research has an impediment which is mainly related to the availability of the indicators. Therefore, it needs further research to find more reliable indicators. For example in economic dimension, indicators needed are related to money flow and solvency debt value, in social dimension the important indicators are inclusiveness and participatory and empowerment, while in environmental dimension essential indicators are the use of natural capitals.

Secondly, the limitation is also related to the targets of the indicators which are partly informed. This research, then, utilises benchmark from other countries experiences. Actually, indicator target is essential for comparison because the assessment is also a policy tool to indicate progress toward set goals of ‘sustainability’ (Pinter, et al, 2012). Without a reference value, a given indicator does not say anything about sustainability (Singh, et al (2012). Future studies need to elaborate the precise development targets for each indicator.

Thirdly, this research utilises national actor perspectives which might be bias for the local context. Thus, it needs future study which can accommodate local knowledge. Bottom-up approach coming from micro scale not only provides a good source of indicators, but also offers the opportunity to enhance community capacity for learning and understanding (Reed, et al, 2006).

Lastly, connected to the point above, comparing performance in the micro level is important because gathering appropriate policies and actions in the complex system needs figure starting from smaller regions which is possibly diverse. This research, however, is a starting view to capture province performance which needs to zoom-in into the micro levels.

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APPENDIX

Appendix 1. List of selected indicator and its definition by dimension

Indicator	Definition	Relevance for Sustainable Development	Link to Sustainability Concept (chapter 2)
Economic Dimension			
Per capita Gross Regional Domestic Product (GRDP) at current market price	Gross Regional Domestic Product (GRDP) shows a level and extent of total economic output produced by a region (United Nations, 2007; Statistics Indonesia, 2013b).	Although it does not directly measure SD, it is a very important measure for the economic and developmental aspects of SD, including people's consumption patterns (UNCSD, 2001).	Welfare (or utility) – as a proximate for goods and services consumed (Munasinghe, 2002,
Unemployment rate	This indicator is ratio of unemployed persons to the active population (Statistics Indonesia, 2013b).	It is a measure of the unutilized labour supply or undesirable portion in a country (Statistics Indonesia, 2011). Unemployment is useful and relevant to measuring SD, because it is the culprit of lacking of purchasing power parity.	Having job in the present and future (Munier, 2005; Ekins, 2008), Vulnerability reduction such as unemployment (Ekins, 2008).
Vulnerable workers	This indicator shows the proportion of own account workers or employers assisted by household member or unpaid worker (Statistics Indonesia, 2012a).	It measures who has informal management and insecure working condition for sustainable economic future.	Having job and economic progress in the present and future (Munier, 2005; Ekins, 2008), Vulnerability reduction such as unemployment (Ekins, 2008).
Ratio of investment on GDRP	This indicator is calculated by dividing Gross Fixed Capital Formation to GDRP. This capital consists of resident producer acquisitions, less disposals, of fixed assets during a given period plus certain addition to the value of non-produced assets done by the productive activity of producer or institutional units (Statistics Indonesia, 2013b).	This indicator is a mean of enhancing the real productive capacity of economy, especially in developing countries with low productive capital (United Nations, 2007). In addition, it is an important element of to increase partnership in the global economy (United Nations, 2008). The capital here includes buildings, machinery and transport equipments which are necessary to renew and expand stock for future prospect (European Communities, 2001).	Capital maintenance (Bartelmus, 2004 in Pinter et al, 2005; Hicks, 1946 in Munasinghe, 2004)
Purchasing power parity	It is counted based on the price of a lot of basic commodities to be purchased (Statistics Indonesia, 2013a).	This indicator represents the ability of individual society to purchase adequate basic needs (services and goods) in the minimum level.	Welfare (or utility) – measured as willingness or ability to pay for goods and services (Munasinghe, 2002).

Social Dimension			
Percentage of poor people	Poor people are defined as people having expenditure per month below the poverty line (Statistics Indonesia, 2012a)	Poverty is both cause and consequence of unsustainable society. In Indonesia, poverty is calculated through the concept of basic needs approach. Therefore, poverty is viewed as economic inability to fulfil food and non-food basic needs which are measured by consumption/expenditure (Statistics Indonesia, 2012).	Vulnerability reduction (example poverty) (Ekins, 2008) and human ill (Holdren et al, 1995)
Gini index	The indicator shows the extent of inequality in income distribution or resource within a society (Statistics Indonesia, 2012a)	Inequality in outcomes such as income or consumption and inequality in opportunities hinder human development and are detrimental to long-term economic growth.	Maintenance and improvement of well-being of current and future generations (Chan & Lee, 2008). Well-being represented by work & balance (OECD, 2011). Reduction of human wellbeing ill: poverty, (Holdren et al, 1995)
Morbidity rate	It is counted by the number of population experienced diseases or the symptoms causing the disturbances in daily activities (Statistics Indonesia, 2012b).	Health and sustainable development are closely connected. Development cannot be achieved or sustained when a high proportion of the population is affected by poor health. On the other hand, the morbity itself represents the poor quality of environment and or economic sustainability.	Maintenance and improvement of well-being of current and future generations (Chan & Lee, 2008). Well-being represented by health status (OECD, 2011).
Infant mortality rate	It is expressed as deaths per 1,000 live births.	The reduction of childhood mortality is one of the most strongly and universally supported development goals. It is related to many factors: poverty; education, particularly of mothers; the availability, accessibility and quality of health services; health risks in the environment, such as access to safe water and sanitation; and nutrition (United Nations, 2001)	Maintenance and improvement of well-being of current and future generations (Chan & Lee, 2008). Well-being represented by health status (OECD, 2011).

Adult literacy rate	The proportion of the adult population aged 15 years and over that is literate (Statistics Indonesia, 2012b)	It is the basic education indicator which is still important in education field especially in developing countries like Indonesia. Related to sustainable/unsustainable development, this indicator is critical for promoting SD and improving the capacity of people to address environment and development issues. It facilitates the achievement of environmental and ethical awareness, values, and skills consistent with SD and effective public participation in decision-making (United Nations, 2007).	Establishment of trust and behavioural norms, and human capital, through education (Munasinghe, 2002), maintenance and improvement of well-being (Chan & Lee, 2008) represented by education (OECD, 2011).
Percentage of population aged 15 years and over graduated from primary education	The proportion of population 15 years and above which graduated from 6 years in primary school and 3 years in secondary school (Statistics Indonesia, 2012a)	Education is widely accepted as a fundamental prerequisite for the achievement of SD. Education is also recognized as a means of changing consumption and production patterns to a more sustainable path. It is vital to changing people's attitudes to achieve ethical awareness, values, attitudes, skills, and behaviour consistent with the goal of building a more sustainable society (United Nations, 2001)	Maintenance and improvement of well-being of current and future generations (Chan & Lee, 2008). Well-being represented by health status, work & life balance, education, social connections, civic engagement, personal security, etc (OECD, 2011).
Share of paid women employee in the non-agricultural sector	It is defined as ratio of paid women workers to the total workers in non-agricultural sectors including industry and services.	It shows gender equality in the employment. It also indicates the degree to which labour markets are open to women. Women empowerment is the sign of eliminating all forms of gender-based discrimination which is essential for defeating poverty and fostering SD (United Nations, 2007).	Inclusiveness and participatory (Jackson, 2007), empowerment of people (Blewitt, 2008 in Koglin 2009), social inclusion (Ekins, 2008).
General crime rate	Crime rate indicates the probability of population exposed to risk of crime, expressed in every 100,000 people. It is counted from total reported crime incidence which includes all criminal cases received by police office, and all crimes caught by police (Statistics Indonesia, 2012a).	Crime is commonly treated as security and a wider quality of life issue which relates to the social sustainability of a society as it affects several components of a countries' structure not only at economic and social levels but also politic (European Communities, 2001). Thus, if development is to be sustainable, it should be able to provide living conditions that would enable people to live peaceful and secure.	Well-being represented by personal security (OECD, 2011), human ills (Holdren et al, 1995), and 'evolvability' (Servaes et al, 2012), maintenance of the health of social & cultural systems (Chambers, 2006).

Environmental Dimension			
Percentage of household using clean water	The indicator monitors progress in the accessibility of the households to improved clean water sources with adequate volume and reasonable distance (Statistics Indonesia, 2012a)	The relevance of this indicator towards SD is to protect human health and the environment. The indicator monitors progress in the accessibility of the population to improved water sources. Accessibility to improved water sources is fundamental to decrease the faecal risk and frequency of diseases (United Nations, 2007).	Ecological health in which natural resource degradation are variables of the health (Munasinghe, 2002).
Irigated wetland area	This indicator is a ratio between irrigated paddy land and the total area	It represents the accessibility of water for agriculture especially paddy land as the basic food source in Indonesia.	Protection of the sources of raw materials (Goodland, 1995 in Moldan, et al, 2012)
CO2 Emissions from Motorized Vehicles and Housing fuels	This indicator measures the emissions of CO2 from the usage of solar, gasoline, kerosene, gas, and firewood.	An increase of greenhouse gas concentration in the atmosphere contributes to global warming, which is a major global challenge to SD.	Protection from climate changes threaten the stability of physical, ecological and social systems and subsystems (IPCC, 2001; Moldan, et al, 2012)
TBC lung prevalence	This indicator shows the number of TBC case per 100,000 population number (Statistics Indonesia, 2012a)	The incident of TBC lung might represent the environmental quality. Although the case is caused by other factors such as nutrients and infection, but it also indicate the unclean living condition.	Ecological health in which pollution is variable of the health (Munasinghe, 2002).
Percentage of forest area	Forest area is a specific territory of forest ecosystem determined and or decided by the government as a permanent forest (Statistics Indonesia, 2012a).	Forests provide many significant resources and functions including wood products and non-wood products, recreational opportunities, habitat for wildlife, conservation of biological diversity, water catchment area and soil conservation, and play a crucial role in the global carbon cycle (United Nations, 2007 and UNCSD, 2001). A continuing and fast decreasing forest area in a country might be an alarm signal of unsustainable practices in the forestry and agricultural sector (UNCSD, 2001).	Ecological health in which natural resource degradation, and loss of biodiversity are variables of the health (Munasinghe, 2002), protection of terrestrial systems (covering natural and managed ecosystems, forestry, biodiversity, food system and ecosystem services) (Moldan, et al, 2012)

Percentage of household using firewood	The portion of household utilizing firewood for cooking	The highly demand for biomass fuels to meet energy needs of households contributes to deforestation and land degradation.	Ecological health in which natural resource degradation, and loss of biodiversity are variables of the health (Munasinghe, 2002),
Percentage urban population	The portion of population living in the 'urban area'.	Big population number has great pressures on local environments because of the increasing pollution and waste from households, industry power stations and transportation mode such as motor vehicles (UNCSD, 2001), increasing consumption of natural resource and consequently the state of the environment (OECD, 2000), such as safe and potable water supply (United Nations, 2007). Because urban is the place for such activities (industry, transport, etc) with the massive use of natural resources, surely it threaten environmental quality.	SD issue covers human settlements and habitats (cities and urbanization) (Moldan, et al, 2012)

Appendix 2. Indicators explanation

No	Indicator Structure	Data Source	Unit	Minimum	Maximum	Explanation	Period	
Economy								
1	GDP Per capita	Statistics Indonesia	000 IDR	3,000	120,000	Indonesian target according to Long Term Planning is equal to Middle Income Countries (Law No 17 2007, Long Term National Developemnt Planning). Middle income countries have GNI per capita maximum $12,475 (World Bank). And the minimum is based on existing situation	2006	2011
2	Unemployment	Statistics Indonesia	Percent	5	20	Law no 17 2007 , Long Term National Development Planning 2005-2025. The target of unemployment in 2025 is below 5%. The maximum point is based on existing condition	2006	2011
3	Vulnerable employment	Statistics Indonesia	Percent	5	90	Law no 17 2007 , Long Term National Development Planning 2005-2025. The target of unemployment in 2025 is below 5% (it can be used as assumption because vulnerable employment is almost unemployed). The maximum point is based on existing condition	2006	2011

4	Investment share on GDP	Statistics Indonesia	Percent	3	40	Value to reach 7% of economic growth based on experts alanysis is 40% (Statiatics Indonesia, 2010). While the minimum is based on existing situation.	2006	2011
5	Purchasing power	Statistics Indonesia	000 IDR	360	733	Human Development Index	2006	2011
Social								
6	Gini Index	Statistics Indonesia	...	0.00	0.40	The minimum value is the ideal condition showing perfect equality. The maximum limit is based on existing condition	2006	2011
7	Poverty rate	Statistics Indonesia	Percent	5	45	Law no 17 2007 , Long Term National Development Planning 2005-2025. The target of poverty in 2025 is below 5%. The maximum point is based on existing condition		
8	Morbidity rate	Statistics Indonesia	Percent	0	35	The minimum is expected number while the maximum is based on existing situation	2006	2011
9	Infant Mortality Rate	Statistics Indonesia	Percent	24	46	The target is 24 according to RPJM (Medium term development planning 2010-2014). The maximum is the existing condition	2006	2011
10	Literacy rate	Statistics Indonesia	Percent	50	100	Ideal/acceptable situation	2006	2011

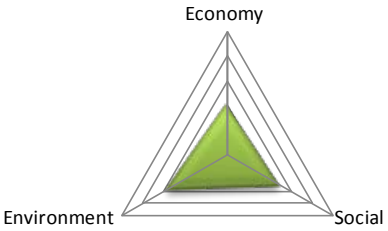
11	Compulsary education attainment population aged 15+	Statistics Indonesia	Percent	30	100	The ideal situation is 100%. The minimum is the existing condition	2006	2011
12	Share paid women in Non Agriculture sector	Statistics Indonesia	Percent	15	50	Balanced situation is reached when the ratio is 1:1 or the percentage of women is 50% of paid employees. The lowest is based on existing situation	2006	2011
13	Crime rate	Indonesian National Police	Per 100,000 population	0	500	The highest crime rates in the existing condition is about 450, thus the estimated highest limitation is 500. While the minimum target is the expected value.	2006	2011
Environment								
14	Clean water access for household	Statistics Indonesia	Percent	20	100	Ideal/acceptable situation is 100% while the minimum is based on existing condition	2006	2011
15	Irigated wetland area	Statistics Indonesia	Per 1000 Km2	0	215	Based on existing condition	2006	2010
16	CO2 Emissions from Household & Vehichles per Capita	Statistics indonesia, and Ministry of Energi and Mineral Resources	Metric ton per capita	0	10	The highest amount in developed country in Asia is 10 (Japan) according to WHO or about 12 in Very high human development according to UNDP (international Human Development Indicator)	2007	2010

17	TBC Lung	Ministry of Health	Per 100 000 population	25	330	WHO data 2007-2011, the lowest happens in American Regions (about 26), and the Highest happens in Africa (about 330) (Global Health Observatory Data Repository-WHO)	2006	2010
18	Forest area	Ministry of Forestry	Percent	0	40	Law no 26 2007 regulate minimim target 30% but for some area such as Kalimantan it is 40% while existing condition the minimum is 0	2006	2010
19	Household using firewood	Statistics Indonesia	Percent	0	90	Ideal/acceptable situation is 100% while the minimum is based on existing condition		
20	Urban population	Statistics Indonesia	Percent	15	100	The minimum is the existing situation while the maximum is the possible situation	2006	2011

Note:

this green shading represents the targets. For the positive indicators, the targets or the ideal situations are the maximum points, while the negative indicators, the targets or ideal situations are the minimum points

Appendix 3. Synergistic Development between Three Development Pillars In Different Provinces



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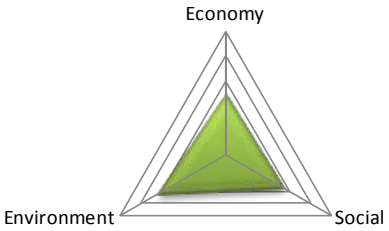
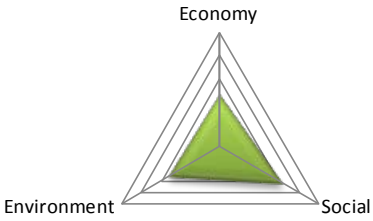
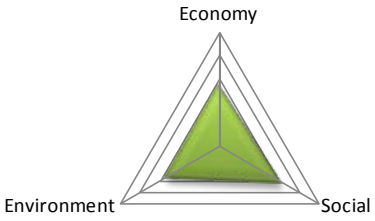


Aceh Performance, 2011



Sumatera Utara Performance, 2006



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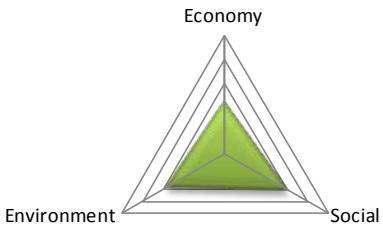
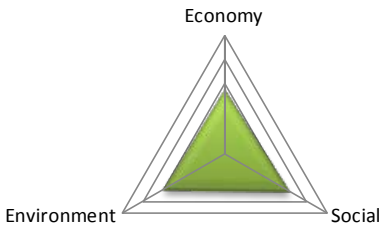
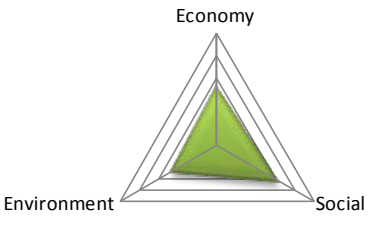


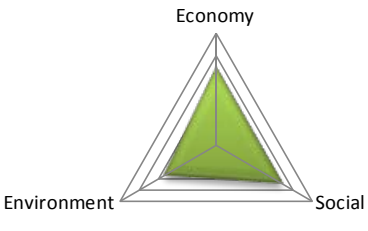
Sumatera Barat Performance, 2006



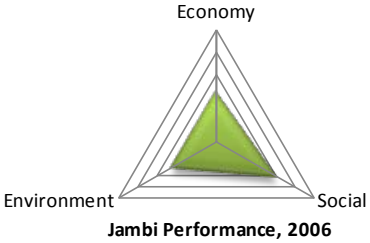
Sumatera Barat Performance, 2011



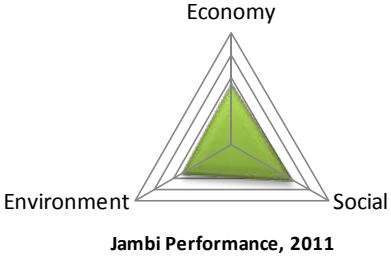
Riau Performance, 2006



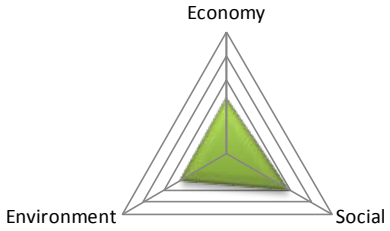
Riau Performance, 2011



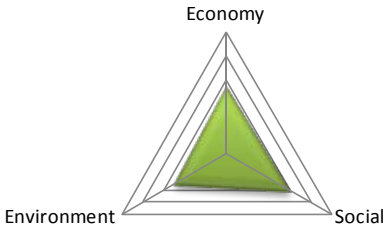
Jambi Performance, 2006



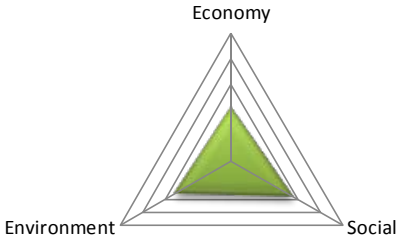
Jambi Performance, 2011



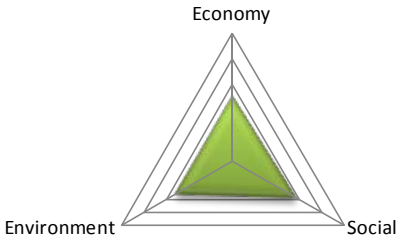
Sumatera Selatan Performance, 2006



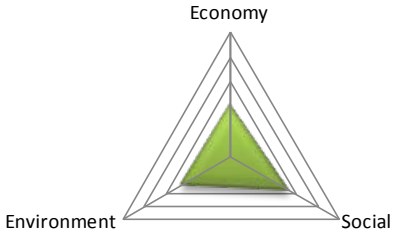
Sumatera Selatan Performance, 2011



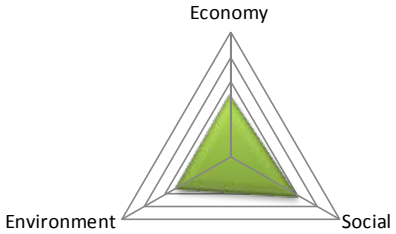
Bengkulu Performance, 2006



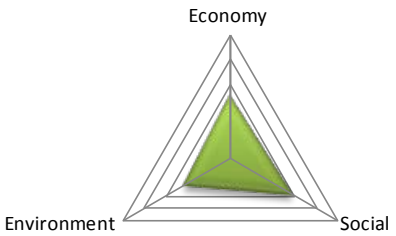
Bengkulu Performance, 2011



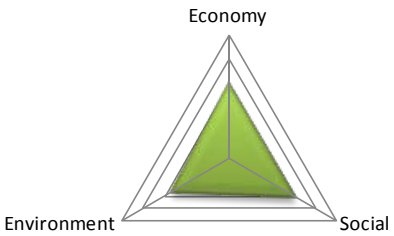
Lampung Performance, 2006



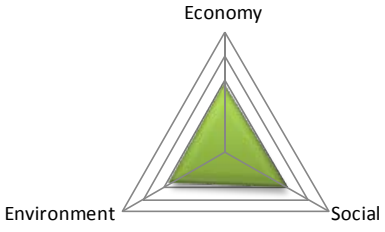
Lampung Performance, 2011



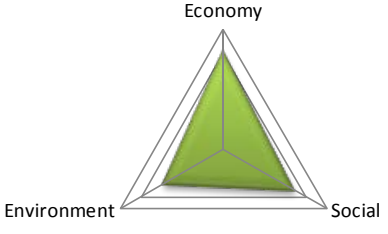
Bangka Belitung Performance, 2006



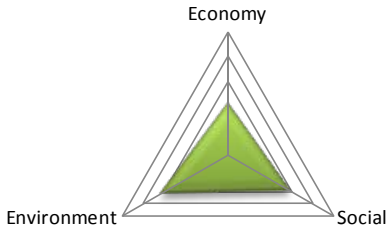
Bangka Belitung Performance, 2011



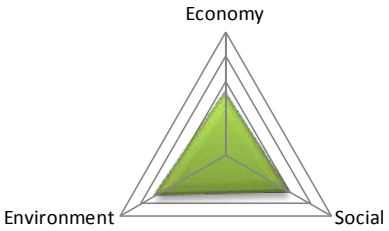
Kepulauan Riau Performnace, 2006



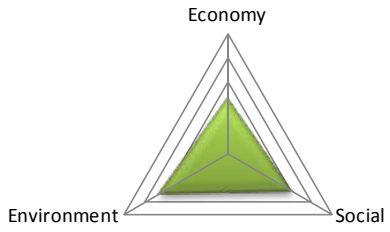
Kepulauan Riau Performance, 2011



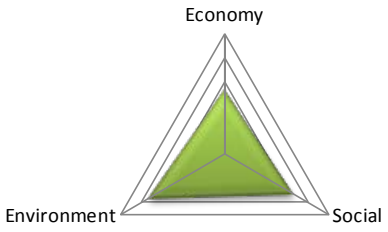
Jawa Barat Performance, 2006



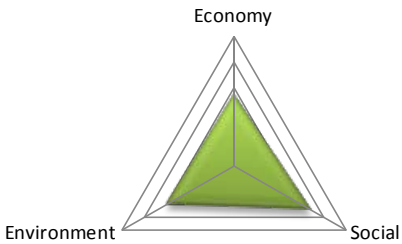
Jawa Barat Performance, 2011



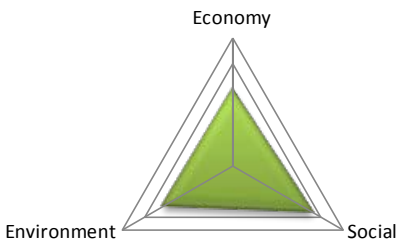
Jawa Tengah Performance, 2006



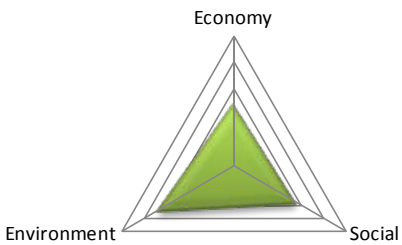
Jawa Tengah Performance, 2011



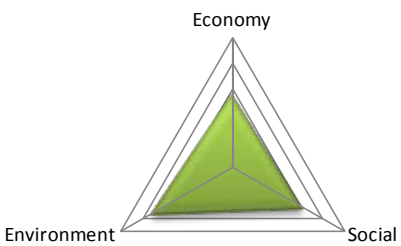
DI Yogyakarta Performance, 2006



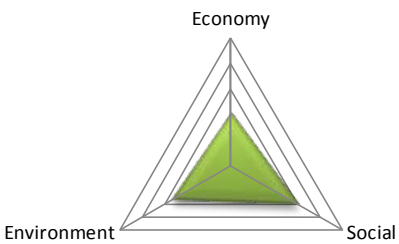
DI Yogyakarta Performance



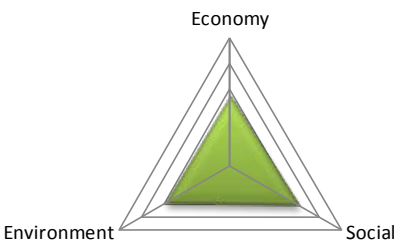
Jawa Timur Performance, 2006



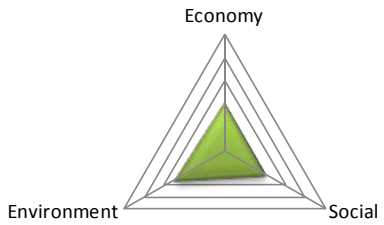
Jawa Timur Performance, 2011



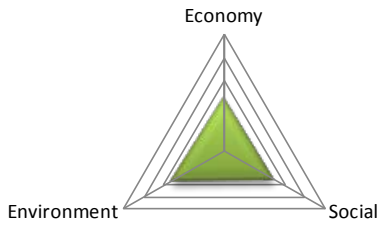
Banten Performance, 2006



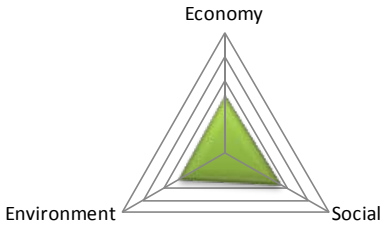
Banten Performance, 2011



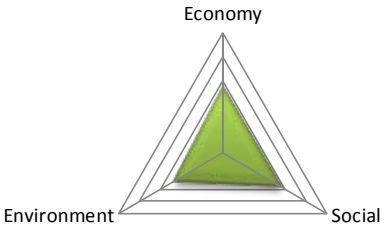
NTT Performance, 2006



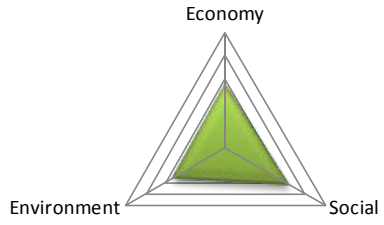
NTT Performance, 2011



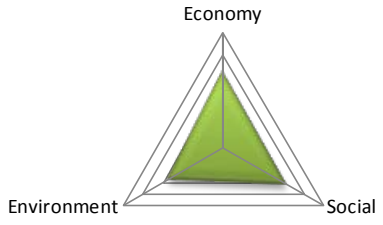
Kalimantan Barat Performance, 2006



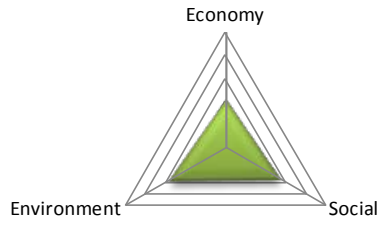
Kalimantan Barat Performance, 2011



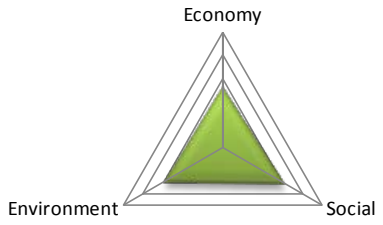
Kalimantan Tengah Performance, 2006



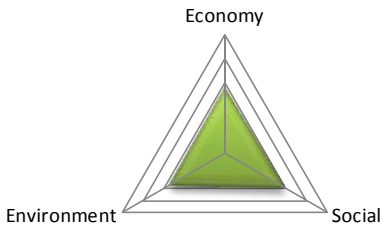
Kalimantan Tengah Performance, 2011



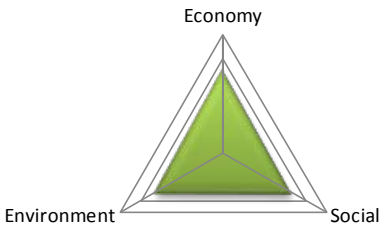
Kalimantan Selatan Performance, 2006



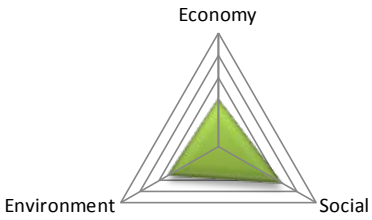
Kalimantan Selatan Performance, 2011



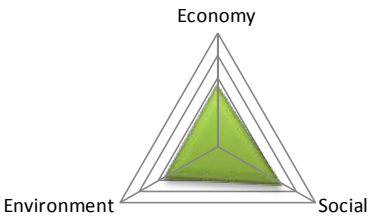
Kalimantan Timur Performance, 2006



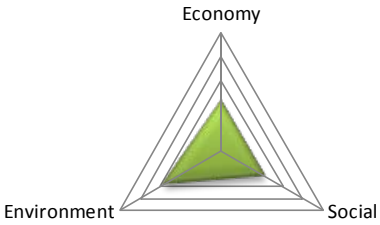
Kalimantan Timur Performance, 2011



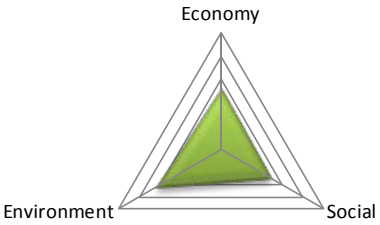
Sulawesi Utara Performance, 2006



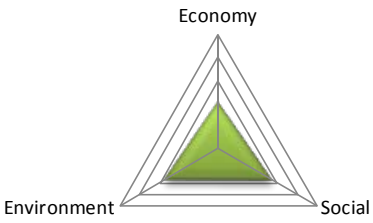
Sulawesi Utara Performance, 2011



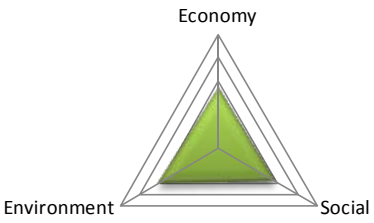
Sulawesi Tengah Performance, 2006



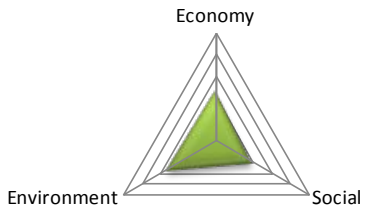
Sulawesi Tengah Performance, 2011



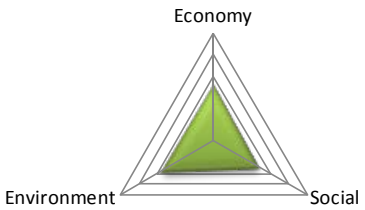
Sulawesi Selatan Performance, 2006



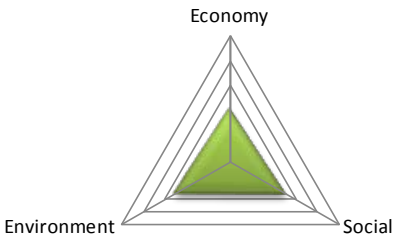
Sulawesi Selatan Performance, 2011



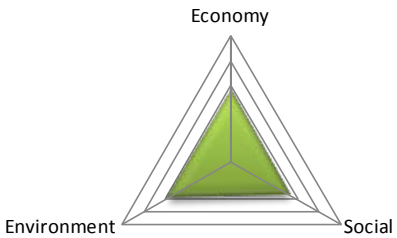
Gorontalo Performance, 2006



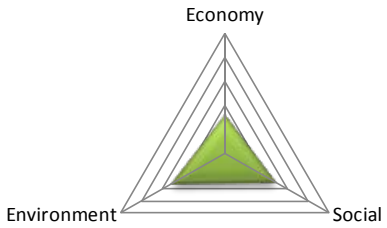
Gorontalo Performance, 2011



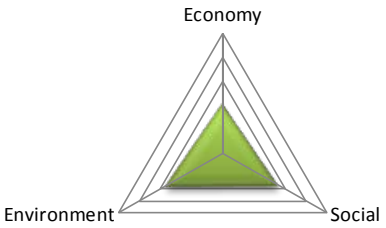
Sulawesi Tenggara Performance, 2006



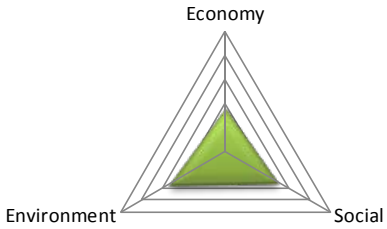
Sulawesi Tenggara Performance, 2011



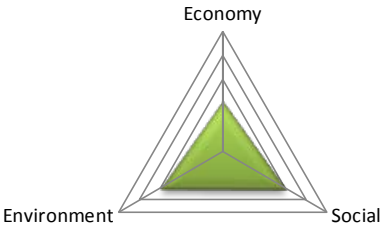
Maluku Performance, 2006



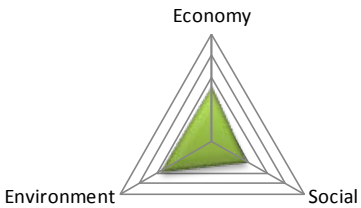
Maluku Performance, 2011



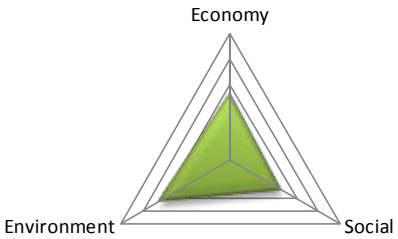
Maluku Utara Performance, 2006



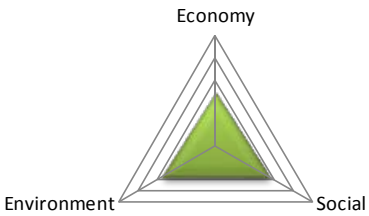
Maluku Utara Performance, 2011



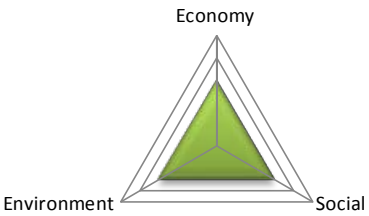
Papua Barat Performance, 2006



Papua Barat Performance, 2011



Indonesia Performance, 2006



Indonesia Performance, 2011

Appendix 4. Sustainable Development Performance by Province, 2006 and 2011

Code	Province	2006				
		Aggregated Index of Dimensions			Total Index	Rank Total Index
		Economy	Social	Environment		
11	Aceh	4.1	5.1	5.7	4.9	18
12	Sumatera Utara	4.4	6.4	5.1	5.3	12
13	Sumatera Barat	4.3	6.2	5.6	5.4	11
14	Riau	5.3	6.4	4.7	5.5	10
15	Jambi	4.5	6.2	4.6	5.1	15
16	Sumatera Selatan	4.5	5.9	4.4	4.9	19
17	Bengkulu	4.1	5.6	5.1	4.9	20
18	Lampung	4.2	5.5	4.6	4.7	25
19	Kep. Bangka Belitung	5.1	5.8	4.3	5.1	16
21	Kepulauan Riau	5.6	6.0	5.2	5.6	8
31	DKI Jakarta	6.5	7.3	4.3	6.0	2
32	Jawa Barat	4.2	5.9	6.4	5.5	9
33	Jawa Tengah	4.6	6.2	6.7	5.8	4
34	DI Yogyakarta	5.4	6.8	6.0	6.1	1
35	Jawa Timur	4.8	5.6	6.8	5.7	6
36	Banten	4.1	6.0	5.3	5.1	14
51	Bali	4.7	6.7	6.3	5.9	3
52	Nusa Tenggara Barat	4.5	3.3	5.7	4.5	30
53	Nusa Tenggara Timur	4.0	4.1	4.9	4.3	32
61	Kalimantan Barat	4.6	5.4	4.5	4.8	22
62	Kalimantan Tengah	5.5	6.3	5.3	5.7	7
63	Kalimantan Selatan	4.2	5.4	5.0	4.9	21
64	Kalimantan Timur	5.4	5.8	6.1	5.8	5
71	Sulawesi Utara	4.1	6.5	5.1	5.2	13
72	Sulawesi Tengah	4.1	4.3	5.7	4.7	27
73	Sulawesi Selatan	4.1	5.5	5.4	5.0	17
74	Sulawesi Tenggara	4.2	5.2	5.1	4.8	23
75	Gorontalo	4.6	3.9	5.3	4.6	29
76	Sulawesi Barat	4.1	5.0	5.1	4.7	26
81	Maluku	3.1	4.9	5.1	4.4	31
82	Maluku Utara	3.6	5.0	5.4	4.7	28
91	Papua Barat	5.0	3.7	5.5	4.8	24
94	Papua	4.2	3.0	5.1	4.1	33
	Indonesia	**4.7**	**5.6**	**5.5**	**5.3**	

Continuation

Code	Province	2011				
		Aggregated Index of Dimensions			Total Index	Rank Total Index
		Economy	Social	Environment		
11	Aceh	4.9	5.5	6.5	5.6	18
12	Sumatera Utara	5.5	6.4	5.5	5.8	15
13	Sumatera Barat	5.3	6.3	6.0	5.9	12
14	Riau	6.9	6.9	5.4	6.4	8
15	Jambi	5.4	6.4	5.1	5.6	17
16	Sumatera Selatan	5.5	6.1	5.0	5.5	21
17	Bengkulu	5.0	5.7	5.2	5.3	26
18	Lampung	4.9	6.3	5.0	5.4	25
19	Kep. Bangka Belitung	6.1	6.2	5.4	5.9	11
21	Kepulauan Riau	8.2	6.9	5.8	7.0	1
31	DKI Jakarta	7.7	7.7	4.4	6.6	3
32	Jawa Barat	5.1	6.1	6.7	6.0	10
33	Jawa Tengah	5.2	6.6	7.4	6.4	7
34	DI Yogyakarta	6.0	7.3	6.3	6.5	5
35	Jawa Timur	5.6	6.4	7.2	6.4	6
36	Banten	5.4	6.2	5.9	5.8	13
51	Bali	6.1	7.0	6.6	6.6	4
52	Nusa Tenggara Barat	5.3	4.2	6.1	5.2	29
53	Nusa Tenggara Timur	4.6	4.9	5.2	4.9	32
61	Kalimantan Barat	5.5	5.5	4.7	5.2	27
62	Kalimantan Tengah	6.5	6.4	5.5	6.1	9
63	Kalimantan Selatan	5.3	6.2	5.1	5.5	20
64	Kalimantan Timur	7.0	6.7	6.6	6.7	2
71	Sulawesi Utara	5.4	6.6	5.4	5.8	14
72	Sulawesi Tengah	5.1	4.9	6.4	5.5	22
73	Sulawesi Selatan	5.3	5.7	6.1	5.7	16
74	Sulawesi Tenggara	5.5	5.3	5.8	5.6	19
75	Gorontalo	5.2	4.9	5.6	5.2	30
76	Sulawesi Barat	4.9	5.5	5.3	5.2	28
81	Maluku	4.0	5.4	5.5	5.0	31
82	Maluku Utara	4.2	6.1	6.0	5.4	24
91	Papua Barat	5.3	4.6	6.4	5.4	23
94	Papua	5.6	3.9	5.1	4.9	33
	Indonesia	**5.7**	**5.9**	**6.0**	**5.9**	

Appendix 5. Correlation between three development pillars, 2006 and 2011

Correlations 2006

	2006	Economy	Social	Environment
Economy	Pearson Correlation	1	0.435**	-0.067
	Significant		0.006	0.355
	N	33	33	33
Social	Pearson Correlation	0.435**	1	-0.016
	Significant	0.006		0.465
	N	33	33	33
Environment	Pearson Correlation	-0.067	-0.016	1
	Significant	0.355	0.465	
	N	33	33	33

**. Correlation is significant at the 0.01 level

Correlations 2011

	2011	Economy	Social	Environment
Economy	Pearson Correlation	1	0.555**	-0.074
	Significant		0.000	0.342
	N	33	33	33
Social	Pearson Correlation	0.555**	1	0.030
	Significant	0.000		0.434
	N	33	33	33
Environment	Pearson Correlation	-0.074	0.030	1
	Significant	0.342	0.434	
	N	33	33	33

**. Correlation is significant at the 0.01 level