

**TOWARDS A SUSTAINABLE STRATEGY FOR  
ECOLOGICAL COMPENSATION OF ROAD  
DEVELOPMENT IN INDONESIA**

Lesson Learned from the United States for Bridging Social – Ecological Conflict

**THESIS**

A thesis submitted in partial fulfillment of the requirements for  
the Master Degree from Institut Teknologi Bandung and  
the Master Degree from University of Groningen

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UNIVERSITY OF GRONINGEN**

**2008**



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## *Abstract*

### **Towards A Sustainable Strategy for Ecological Compensation of Road Development in Indonesia**

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*Potential environmental degradation caused by road development encouraged engineers, ecologist and policy makers to develop planning concept in dealing with nature and landscape to achieve sustainable development. Environmental Impact Assessment (EIA) is one of tools to measure the significance impacts of road projects to environment. Resulted from EIA study, there is a sequence or hierarchy of mitigation measures. “Avoid, minimize and compensation” become alternatives may be taken by permittees to maintain ecological value. Ecological compensation is the last option taken if environmental impacts are unsolvable by other alternatives. Many developed countries have implemented ecological compensation for road development as a part of their policy. Meanwhile, many of developing countries such as Indonesia have not fully concerned yet to this kind of concept. Rising environmental issues to deal with and public demand in environmental performance, Indonesia may to start to concern on ecological compensation concept. However, it should be highlighted that the implementation of ecological compensation may cause social implication as secondary effect. Local communities who live on the land as compensation area may get disadvantages because of resettlement or disturbance on the social structure. In other words, there may be a potential conflict between ecological and social interest. The lesson taken from US experience may be needed to take into account before the implementation of ecological compensation by taking environmental justice principles as basis issues.*

*This study focuses on the possibility on ecological compensation to be implemented in Indonesia by reflecting on potential conflict between environmental (ecocentric) and social (anthropocentric) views. Therefore, the objective of this study is to get clear description the importance of ecological compensation and to have the insight of key factors for the implementation of socio-ecological compensation linking to environmental justice principles. To get these objectives the analysis is based on comparative analysis between US and Indonesia using six elements consisting of (a) ecological targeted-performance; (b) government direction or policies; (c) coordination; (d) public participation; (e) dispute resolution; and (f) independent oversight. There are some positive points from Indonesia that may be used as starting points such as the raising of public participation in decision making process and public awareness on environmental issues. Nevertheless, there are also points that still need to be paid attention to for the implementation of socio-ecological compensation in Indonesia. Unclear environmental goal in practice, unclear and less integrated environmental regulations to other sectors, lack of coordination among different government institution, less coordinated of public involvement in nature area management are some points to be considered. For the implementation, the approaches used in US practice such as land trust and mitigation banking may be a*

*potential instrument to be developed in Indonesia by considering the societal condition.*

*Looking at the existing condition of Indonesia and some lesson learned from US experiences, there are some points to be recommended as requirements for the implementation of socio-ecological compensation in Indonesia. Those are (1) developing government regulation of environmental performance; (2) improvement in institutional setting by improving coordination among actors involved, strengthening environmental agencies, improving institutional setting for realizing ecological compensation in socially sound, and improving in oversight mechanism; and (3) improvement public participation mechanism for poor people or affected groups. This study demonstrates the importance of social implications considerations resulted from environmental policy, especially when the policy is implemented in countries that has complexity in social structure such as Indonesia.*

***Key words:*** *road development, ecological compensation, social implication, sustainable development, environmental justice principles, requirements for the implementation of socio-ecological compensation*

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## Preface

My intention to the topic of this thesis has been started since I had Environmental Planning class discussing ecological compensation as one of lecture contents. Due to the new concept of ecological compensation for developing countries such as Indonesia, I think the issue on ecological compensation is interesting to be discussed further. Moreover, the topic is related to my study background and my current job in planning field. This study has been done as the final requirement to have master degree on Programme of Environmental and Infrastructure Planning (Faculty of Spatial Science, RuG, the Netherlands) and Development Planning and Infrastructure Management (School of Architecture, Planning and Policy Development, ITB, Indonesia).

The main topic of this study concerns to the potential of social implications caused by ecological compensation policy of road development. Hence, for Indonesia context, it has to be considered to implement ecological compensation in more socially sound (socio-ecological compensation). The study takes US experience as lesson learned due to the longer experience in ecological compensation practice based on the six elements (ecological targeted-performance, government direction or policies, co-ordination, public participation, dispute resolution, and independent oversight). At the end of this study, it has been assessed the possibility the implementation of socio-ecological compensation in Indonesia.

I strongly realize that I will not be able to complete the thesis if there is no any support. Therefore, first of all I would like to thank to Allah SWT for His blessings and for giving the strengths and capabilities to think in critically and creatively to finish the study. Then, special thanks I would be dedicated for my supervisors, Prof. E.J.M.M. Arts (RuG) for giving me many worthy suggestions, directions and motivation to finish the thesis, and Pradono, SE, M.Ec.Dev., Dr.Eng (ITB) for giving comments and suggestions to make my thesis better. Many thanks are given to lectures and faculty staff members at ITB and RuG and to lectures in UPT Bahasa ITB. I would also give my appreciation NESO and Bapeda Kabupaten Tangerang that have provided opportunities for me to have study in abroad.

Many thanks are also dedicated to all my friends of Double Degree 2006 and my best friends in Bandung for all of the precious moments, colored life and motivation to keep moving forward. The last but not for the least, I would give many great thanks to my husband, Yudi Saptono, who always be there to support me. Great appreciation is also special given to my parents and my lovely sister for the precious supports which are irreplaceable.

Groningen, August 2008  
Ira Rahayu Yulianty Rahmah

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# CHAPTER I

## INTRODUCTION

### 1. 1 Background

In many cases the development of infrastructure, transportation infrastructure has the most conflicts with the environment. Instead regarded as a part to increase economic productivity within or between regions, the action of the infrastructure on the environment affects structure and function within ecology system. In general, roads developments give the effects to abiotic and biotic component of ecosystem. They create disturbance due to the noise resulted, changes in water quality, pollution, and reduce the quality of the habitat adjacent to the road (Bohemen, et.al. 2004). Partition or destruction of environment, farmland and wildlife habitats, and the congestion can be severe consequences on the roads Development (OECD 1988 in Button, K 1993). They are also responsible for direct deaths of a large number of animals. For example, 10%-15% of the Dutch badger was killed each year on motorways (Bekker and Canters in Bohemen. 2004). Moreover, roads have cumulative effects on landscapes such as loss of habitat through transformation of existing landcovers to roads (Angelsen and Kaimowitz, 1999 in Coffin, 2007). Roads also form barriers and isolation habitat patches that cause the reduction of habitat quality by the fragmentation and loss of connectivity (Bohemen, 2004, and Theobald et al, 1997; Carr et al, 2002 in Coffin, 2007).

These effects have increased awareness of civil engineers, ecologist, and policymakers to develop planning concept to deal with nature and landscape. Serious attention is paid to Environmental Impact Assessment (EIA) as an attempt to prevent damage to nature by giving technical designs and alternative routing plans (Cuperus, et al 1996). Hence, it has been developing ecological engineering in road development as a tool for EIA. This concept combines the field of civil engineering and ecological to reduce the impacts to the environment by using high level technology. Furthermore, Mitsch (1998) and Bohemen (2005) stated that ecological engineering focuses on two aspects:

- Restoration, design and construction of water and terrestrial system that has disturbed by human activities,

- The sustainable harvesting of existing and development of new ecosystems that have human and ecological value.

In line with the concept, Cuperus (1999) argue that the most fundamental approach in environmental intervention on road development is by preventing adverse impacts or by limiting the intensity of magnitude of the development. The second approach, mitigation, can be undertaken if avoidance action is not feasible. The third approach adopts compensation principles to counterbalance the adverse impacts of developments on nature for impacts that may still persist after mitigation. Moreover, Bohemen (1998) argued that the most logical steps to reduce the impact of road and traffic is by preventing fragmentation, removing fragmentation, taking mitigation measures on the road, and taking compensation measures when the negative impacts to the nature is unavoidable <sup>1</sup>.

The approaches to avoid and reduce negative environmental impact caused by road and traffic are related to the ‘precautionary principle’ for environmental protection. According to Mitchell (2002), the precautionary principle reflects the understanding that it is better to avoid and reduce harmful environmental impacts than to deal with the negative environmental consequences afterwards. Related to that, ecological compensation principle has the basic concept of precautionary principle in terms of it has the same goal to anticipate potential harmful environmental impacts (Mitchell, 2002). It also has goal to ensure that the ecological quality and value will be the same between before and after human interventions (no-net-loss) (Cuperus et. al. 1996).

Taken to another understanding, ecological compensation in another term that is defined as environmental compensation is a tool for achieving sustainable goals (Rundcrantz, K 2006 p. 351). Moreover she argues that environmental compensation is “an approach to maintain ecological functions despite exploitations. It is aimed at improving damaged ecological functions or to create new well functioning values” (Rundcrantz, K 2007 p. 40).

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<sup>1</sup> In another country such as the Netherlands, mitigation and compensation are used in more specific terminology. The term “mitigate” only means to minimise harm or to make it less severe (ten Kate et. al 2004). Meanwhile compensation is used for defining offsets of negative impacts left. However, in US, the term of compensation and mitigation are often indistinctive. **Mitigation** is not only used to represent a process to reduce loss of natural lands, focusing on avoiding loss and impact, minimizing impact, but also in representing compensation efforts for unavoidable natural land loss (Alberta Environment of Canada. 2007; NEPA)

[www.environment.alberta.ca/documents/Provincial\\_Wetland\\_Restoration\\_Compensation\\_Guide\\_Feb\\_2007.pdf](http://www.environment.alberta.ca/documents/Provincial_Wetland_Restoration_Compensation_Guide_Feb_2007.pdf)

### **1. 1. 1 Ecological compensation and its social-related issue**

In principle, there are three human values to nature that relate to each other: utilitarian (anthropocentrism), intrinsic (ecocentric approach), and spiritual and ethical value (Prato and Fagre, 2005). Anthropocentrism sees human as the dominant species on nature (Watson 1983 in Prato and Fagre, 2005) and believes that nature only have instrumental or use value as opposed to intrinsic value (Capra 1995 in Prato and Fagre 2005). In contrast, as a reflection of the deep ecology perspective, it shall inform intrinsic value on nature. The approach implies that all biotic elements in nature have equal moral status to exist (Prato and Fagre 2005).

All these values are involved in ecological compensation in practice. In social environment, ecological compensation as a consequences resulted from human intervention or *economic* action (e.g road development) is not only concerned in *ecology* or ecosystem level (eco-centric view) as primary impact but also in connection with *social* adverse consequences for the community affected by the compensation (anthropocentric view) as secondary impact such as related to employments or settlements issues. In practice and knowledge development, environmental management in physical intervention such as road development is about causal relationship between social setting and biophysical. As Sloomweg, et al (2001) argues that other than social changes resulted from physical interventions cause changes on the biophysical environment (create biophysical impacts), biophysical impacts resulted from those reaction may also result in social impacts.

In contrast, since the concept of sustainable development concept has been proposed, most studies develop their knowledge in purpose for the sustainability of the environment. They are more concern to environmental impacts caused by human activities, but less concern to social consequences that can be caused by environmental performance. Today empirical science shows that people tend to relate more on biocentric or ecocentric studies, but less related to research focusing on anthropocentric consequences caused by ecocentric action (Stenmark, 2000 in Rundcrantz, K 2007). The phenomena imply that the concern of people has not been fully complied with the principles of sustainable development as ultimate goal.

However, it is generally known that the central point of sustainable development is the inter linkage between economic, social and environmental elements. Although the efforts for economic growth are important to be created, it is also important to consider the ecological and social consequences. Taken to more practical matter, when road plan (economic intervention) is permitted, it should relate to mitigate negative impacts of road development through environmental performance or ecological compensation. However, it should also concern the social impacts that might emerge from the compensation policy. As Turner (1999) stated that if the utilisation of nature resources must be narrowed by a precautionary approach to the management and conservation of the environment (e. g. ecological compensation principle), it is inadequate basis for the achievement of intended sustainability goals. It means that the sustainability goals may not be achieved if there is a restriction of human activities on the use of nature resources. If precautionary approach is too rigid restraining people for achieving their social safety and needs in the use of natural resources e. g in jobs (intragenerational equity), it will affect community's life (social issues). However, if the approach is too footloose without any legally binding, it ignores the environmental directives for protection future generation's environmental needs (intergenerational equity). Hence, sustainable environmental management strategy must be able to address both intragenerational equity and intergeneration equity issues (Mitchell. 2002 pp. 78)<sup>2</sup>.

Furthermore, it should be noted that in the practice of ecological compensation, there are two orders of impacts involved that influence social settings, especially in the affected area. First, the physical intervention caused by development of new roads or improving of existing roads may give negative impacts to the quality of the environment. It may change biophysical setting that has function in 'production functions'<sup>3</sup> of nature (first-order change) (Slootweg et. al. 2001). In this case, the disadvantage groups are local community or ethnic tribes that have spiritual connection with the nature such as native Indian tribes in US (Zaferatos. 2006) that minority in numbers. To reduce or compensate the impacts, ecological compensation may take a role. Ecological compensation which seeks to ensure quality of the environment is

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<sup>2</sup> The focus of this thesis is by taking perspective anthropocentric for intragenerational equity issues, and ecocentric for intergeneration equity issues.

<sup>3</sup> refer to the ability of the natural environment to generate useful products for humanity (Slootweg et. al. 2001)

associated with an attempt to preserve ‘regulation functions’<sup>4</sup> of biophysical setting (Slootweg et. al. 2001). However, the policy of ecological compensation on road development may ‘force’ the developer or government to provide some squares of land as compensation area that they might be taken from agriculture land, industrial area or other productive lands. Here, it may lead to disadvantages for local community who use the land as economic sources for their life e.g farmer or labour. When the farmland is pointed as compensation area that has function for the preservation of nature and species, it means that there may be a conversion of landuse from agriculture to preservation area. The same experience will be subjected to population nearby industrial area. Consequently, it will influence the economic base structure of community and then, the social settings will also be changed. In other words, environmental performance focusing on the safeguarding of ecological system also affects the social values of local community (second-order change) (Figure 1. 1).

The social issue in ecological compensation also related to geographical dimension between the developed countries such as European countries, US, etc and the developing countries such as Indonesia. The increasing issues on global warming encourage world organizations to promote environmental directives in relation to biodiversity preservation, emission reduction actions, etc. Many of these nature preservation policies direct to the ‘restriction’ in the use of resources in developing countries. The ‘restriction’ on consumption may cause people in those countries burden to expand their social-economic life activities. Most developing countries, especially those that have high economic growth orientation in the development (i.e Indonesia), are more concern on large economic losses if emissions reduction targets are very high (Kemfert, C. 2007). Meanwhile, developed countries that have more stable economic condition consume 88 percent of world’s resources each year and generate most of pollution and waste (Miller. 1994 in Gardner and Stern. 2002). That is why Gardner and Stern (2002) argue that environmental problems and issue be linked to equity issues.

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<sup>4</sup> relates to the maintenance of ecosystem support systems. Examples of regulation functions include: maintenance of groundwater levels, maintenance of biological diversity, protection against natural forces (coastal protection by mangroves) and protection against harmful cosmic radiation (ozone shield) (Slootweg et. al. 2001)

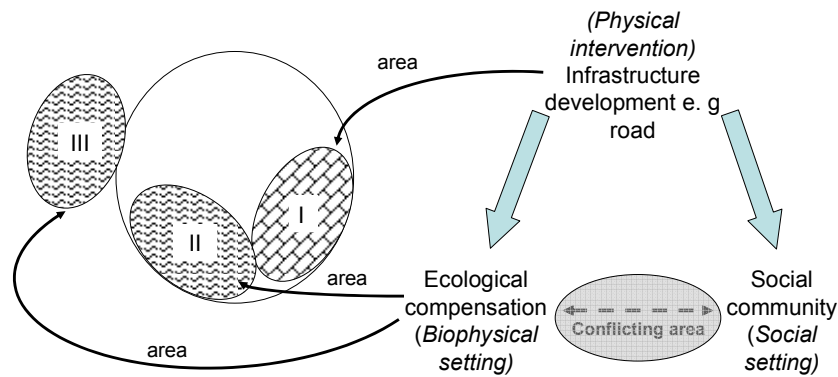
### **1. 1. 2 Environmental justice principles in ecological compensation**

The conflicting issues between social and ecological interests raise the concept of environmental justice to be concerned in environmental performance. Environmental justice is one of considerations that affect ecological compensation in practice. It was derived from unequal distribution of environmental access for low income and minorities people. So, mainly environmental justice movement was initiated by community-based activism (Monsma. 2006). But, it is also can be done by other parties.

In US, environmental justice has become one of main considerations in environmental management of the country. The concept has been developing since early of 1980s. The principle established in the environmental regulation based on the executive order 12898. The President of US stated to release procedures for indentifying and addressing environmental justice in the National Environmental Policy Act (NEPA) in respect to the plurality of social condition e.g. Indian tribes or other minority groups (CEQ 1997). According to CEQ – Council on Environmental Quality (1997), “environmental justice concerns arise from unequal impacts of minority, low-income populations, and Indian tribes on their natural or physical environment, and on their social or economics (e.g human health or ecological impacts) on”. In short, environmental justice becomes prominent issue in US for bridging the conflict or inequity of environmental effects that may rise as consequences from human interventions.

Environmental justice may influence the approaches proposed in ecological compensation. In this thesis it will be elaborated some approaches such as land trust and other approaches to tackle the ecological compensation with socially responsible aimed at reconciling the conflict of interest between social and environmental views. The approaches may have connection with environmental justice principles in bridging the dispute. The few explicit explanations about the practice of the compensation and the relationship with social issues make environmental justice principle is important to take into account. The development of environmental justice principle in US gives some insights of how the concept is being relevant to the environmental performance, especially the ecological compensation.

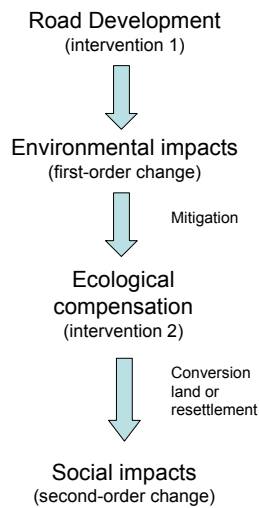




**Area I** : area affected by infrastructure (forest or natural area)  
Affected people : local communities, origin tribes that have spiritual connection to nature

**Area II** : in site compensation area (housing, industries or agriculture area)  
Affected people : farmers, local communities → impact : the change in economic base structure

**Area III** : off site compensation (housing, industries or agriculture area)  
Affected people : farmers, local communities → impact : the change in economic base structure



**Figure 1. 1. Description of the potential conflict between social and ecology**

### 1. 1. 3 Environmental management issue in Indonesia and the challenge

Economic growth is still become primary agenda of the Government of Indonesia by stating in the National Medium Term Plan ([www.bappenas.go.id](http://www.bappenas.go.id)). Given this prominent goal, the government develops network layer by constructing new roads and improving existing road to mobilise economic activities between different regions. It

has been proven through many studies that road development has positive correlation with economic growth. Boarnet (1996) in Berechman et. al (2006) examined that highway investment redistribute economic benefit to the area along the highway (direct impact) and to remote location from the highway (indirect impact). Moreover, Haughwout (2000) in Berechman et. al (2006) argued that infrastructure has positive correlation with the increasing of productivity and consumption benefits in firms and households. As the consequences, road is become important element for economic growth of places. However, the growth goal often leads to the exploitation of natural resources. The conversion of area from original land e. g conservation area, farmer land or local settlements to road pavement is inevitable. It has potential negative impacts to nature and social community e. g. local communities that vary in ethnics, occupations and levels of income.

These consequences have become worrying issue for many people who have concern on environmental quality especially if there is a road plan that want to be constructed upon conservation or preserved area such as the road plan crossing National Park in Sebangau in Central Kalimantan ([www.wwf.or.id](http://www.wwf.or.id)) or road plan crossing public forest park (*Taman Hutan Raya*) in Bandung ([www.bplhdjabar.or.id](http://www.bplhdjabar.or.id)). Hence, in Indonesia, it has been developed methods for assessing the impact on the environmental for each project that has significant impact. Through the Government Regulation No. 27/1999 about Environmental Impact Assessment or *Analisis mengenai Dampak Lingkungan (AMDAL)* the projects proposed will get permit if those are assessed as 'save' project to environment. However, there is still some lack of concern to environmental impacts in practice. The procedure of AMDAL has been taken to meet the permit requirements of some projects, but less to be verified in the implementation, so the report of *AMDAL* is only paper work without any further action taken. As Purnama (2003) stated that Government of Indonesia still gives lower priority to environmental aspect not only in policy levels but also in its implementation.

However, the environmental actions that have been tried to be implemented still has issues remained to be faced. Recently issues in Indonesia indicate that there are some social constraints faced by the government in purpose to create new green spaces in urban area. As an example case, for the year of 2008, the Government of Jakarta Province has project plans to condemn some poor settlements with a view to modifying the land for public green space (Irawaty, 2008). Even though the actions are directed for

making better environmental functions especially in urban area, such actions cause social implication. Many poor people who used to live there may lose their homes, occupations, and opportunities for easier access to urban amenities. The financial compensation given to them is not necessarily enough for them to start new life in another place. Here are social issues related to environmental performance.

From these cases, it may indicate that the existing environmental performance has only concerned to environmental concern (ecocentric). Meanwhile, the awareness of potential of the adverse social impact (human centric) caused by alternatives environmental performance proposed in EIA (*AMDAL*) report, like unemployment as a result of resettlement, has still not involved in the regulation and in practice.

Consequently, the implementation of ecological compensation in road development must be a challenge for the Government of Indonesia. The government should take both ecology and social consideration into account in the process of the transferring ecological compensation concept for road development plan.

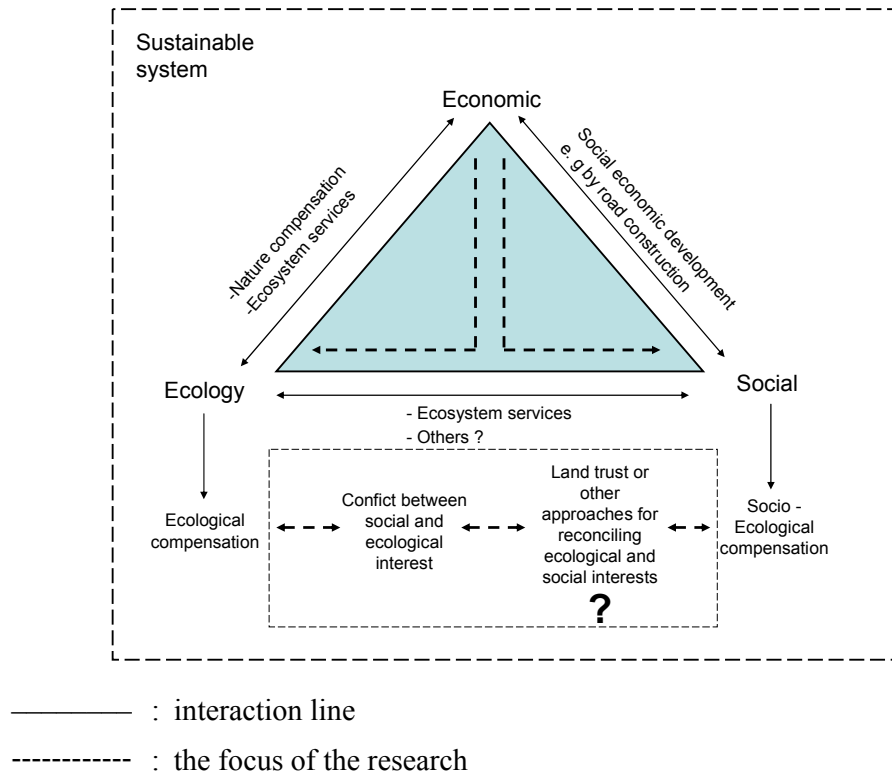
Through this research it is expected to get insight in the key factors in the implementation of ecological compensation in road development in more socially sound. Furthermore, perspectives on environmental justice relationship in ecological compensation strategy to reconcile ecology and social conflicting interests also become important outcome of this thesis. Then, the result can be as recommendation for implementation in Indonesia.

## **1. 2 Research objectives**

Mostly in developing countries road development has only been seen as economic mobilisation with less consideration to ecology impact caused by intervention of road development to environment. Ecological compensation for infrastructure development impacts particularly in road development becomes important as a touch stone to reach sustainable development. However, the ecological compensation also has potential social implications that must be challenging for Indonesia. Hence, this research aims *to get clear insights into the importance of ecological compensation towards sustainable development and to have the insight of key factors for the implementation of ecological compensation in more socially sound (socio-ecological compensation) linking to environmental justice principles based on comparative analysis between US and*

*Indonesia*. Socio-ecological compensation has been termed as the focus of this study representing a condition in which environmental and social values as considerable elements in the implementation of ecological compensation.

In short, the conceptual framework that wants to be discussed in this thesis can be displayed on Figure 1. 2 below :



**Figure 1. 2. Conceptual framework**

### 1. 3 Research Question

This research wants to achieve the objectives by answering this question: How could the implementation of ecological compensation on road development be appropriate to cope with the conflict between ecology and social interest according to the environmental justice principles?

To answer this question, it will be divided into some sub questions as follows :

1. How is ecological compensation carried out in road development planning and what are social issues related to it?

Ecological compensation policy has been implemented to offset the negative impacts on the environment resulted from road development. Through this question, it will be discussed about the purpose of the ecological compensation, in what state this mitigation instrument has been applied, and the problems that may be found in the implementation, including the possibility of a conflict between social and ecology interest

2. How is ecological compensation implemented in US and what are strategies taken there for the implementation with its relevance to potential conflict between ecological and social issues?

It has been developed alternative approaches for the implementation of ecological compensation. These approaches may become alternatives to address potential conflict between social and ecological view when ecological compensation is implemented. It will be explained of what the purpose of these approaches, the principles, and what factors supporting the concept to work (e. g. legislation, participation, actors involved, etc). It also will be elaborated the strengths and the weaknesses or limitations faced in the practice. Hence, it can be achieve some insights on how these problems can be resolved. The explanation will be linked to environmental justice and sustainable development principles.

3. What lessons can be learned from the United States experiences based on the strengths and constraints of ecological compensation implementation for the implementation in Indonesia, especially for the implementation of ecological compensation in more socially sound?

By reviewing and analyzing the strengths and limitations arisen from the implementation of ecological compensation in US, some lessons can be taken as inputs for the implementation in Indonesia in the context of sustainability and environmental justice principles. The context of circumstances between US and Indonesia in the environmental and socio-economic status, will be take into account to examine the possibilities for the execution in Indonesia. In short, by

answering the question, it will be identified key factors for better the implementation of ecological compensation in Indonesia based on US experiences. The potential difficulties in transferring the concept to Indonesia and possibilities way to overcome these also will be recommended as considerations.

#### **1.4 Research Methodology**

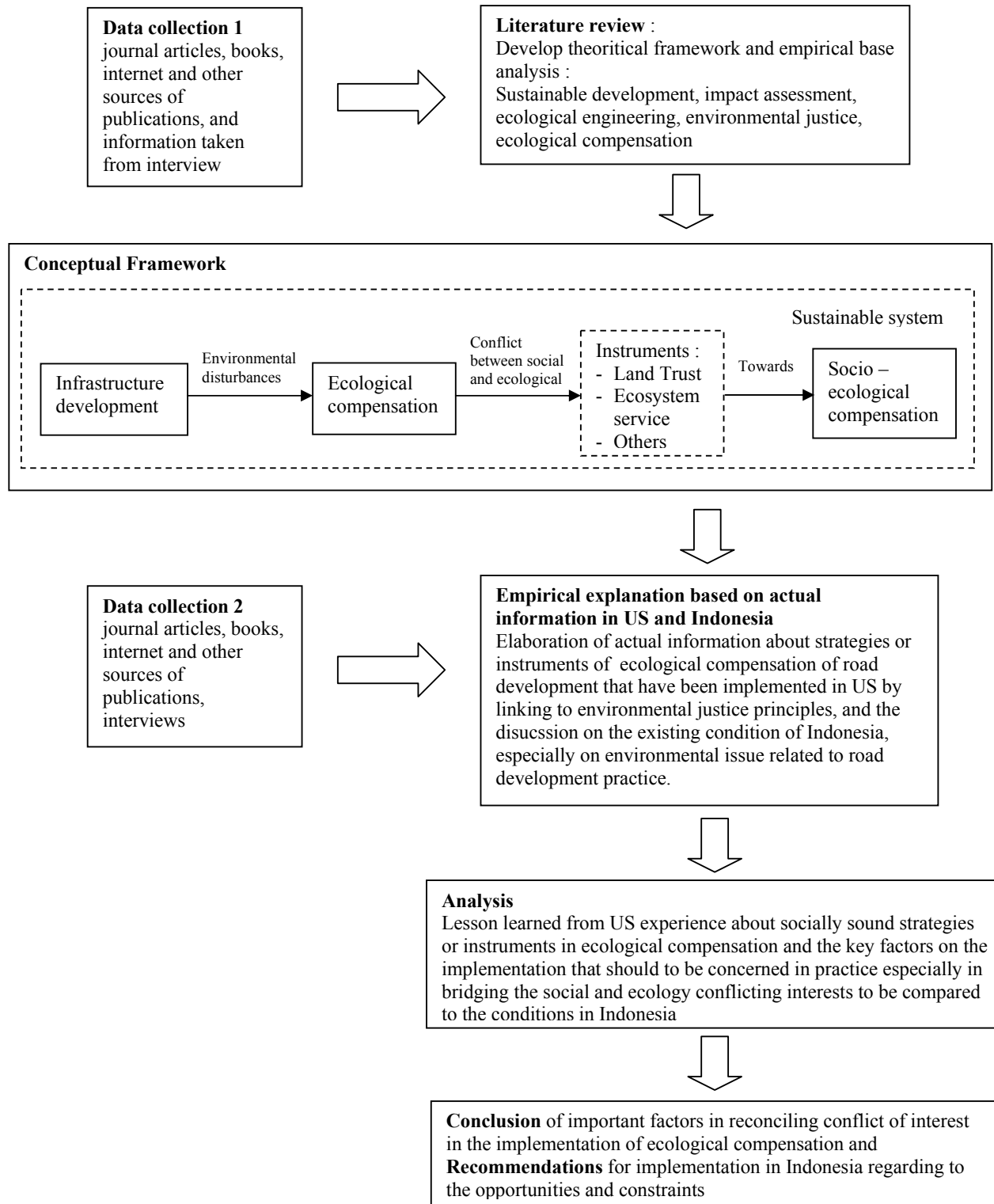
This research has been developed through a series methodological approaches (see figure 1.3). *Literature review* has been considered as the first step for the development of further analysis of this research. The purpose of this step is to get theoretical basis in ecological engineering, environmental justice, ecological compensation and international experiences that mainly to answer the first research question. The output of this step is used as inputs for the more detailed elaboration of this study. Because this research is developed as theoretical explanation, I use *secondary data* taken from journal articles, books, internet and other sources of publications to get some important and sufficient information. Moreover, the references also have been obtained from *interviews* with two experts in the field of environmental performance (see appendixes). The questions had been focused on social and environmental issues in environmental performance, specifically issues in ecological compensation. The result of literature review and interviews is used to support and clarify the discussion on ecological compensation concept and social issues related as the focus of this study.

The second step is *empirical explanation based on actual information* taken from the United States experiences. The explanation has connection with the implementation of ecological compensation for the road development, particularly on the strategies of ecological compensation used for bridging social and ecology conflicting interest linked to environmental justice principles. The explanation also has been supported by interviews result. Hence, by this step, I answer the second and third of research question. In this step, the existing condition of Indonesia also be drawn up in connection with its environmental policy in road development and the challenges for the implementation of ecological compensation. In short, this step will be divided in to sub steps as follows:

- The experience of ecological compensation in US may be relevant to the topic of this thesis. The 30 years experience may give insights to the establishment ecological compensation concept in practice. Moreover, environmental justice in US also plays a prominent discussion for any practice. Hence, it is important to elaborate and analyze ecological compensation in US, and it has been discussed in this step. The discussion has been associated with the strengths and limitations in the implementation especially in reconciling ecology and social conflicting interests.
- The second step is elaboration and analysis of existing condition in Indonesia considering to the socio-economic conditions and the environmental policy related to road development, and potential difficulties in transferring policy process. From this step, it can be measured of the possibility and challenge of ecological compensation in Indonesia.

The last step is ***analysis and conclusion*** using a qualitative approach aimed to get some new understandings. From the previous steps, it can be achieved clear identification of key factors on ecological compensation strategy as lesson learned in practice especially in bridging the social and ecology conflicting interests. Those have been compared to current situation in Indonesia. It may also conclude the possibilities approaches for socio-ecological compensation in Indonesia, potential difficulties in transferring concept to Indonesia and potential solutions to overcome them. Hence, from this analysis, it can be interpreted recommendations for the implementation in Indonesia.

*Research Methodology*



**Figure 1. 3 Research Methodology**



## **1. 5 Report Structure**

The result of this research consists some theoretical and empirical contents based on the frame of thought (see figure 1. 4) as follows :

### **Chapter 1 : General introduction**

This chapter discusses about the background and the significance of this research. In addition, it also gives explanation about the research questions and objectives. These are a guidance of doing and writing this research. In this chapter, there is also description of methodology taken to accomplish this research. Briefly, the contents of this chapter can be described as follows:

- Background
  - Negative impacts to environment caused by infrastructure
  - The importance to decrease the adverse impacts caused by infrastructure development by ecological compensation as an alternative
  - Sustainability in ecological compensation concept
  - Potential conflict resulted from ecological compensation
  - Indonesia environmental management practice issues
- Research Question
- Research Objectives
- Research Methodology
- Report Structure

### **Chapter 2 : Theoretical Framework**

This chapter will elaborate about the concept and method of ecological compensation and its correlation with sustainable development and environmental justice. In this chapter, it is also discussed some approaches developed in ecological compensation. Finally, based on the theoretical framework, conceptual framework analysis is shaped. In detail, this chapter consist of the contents as follows :

- Sustainable development, EIA, ecological engineering
- Ecological compensation as an alternative in environmental management

- Environmental justice in ecological compensation concept
- Practical issues and approaches in the implementation of ecological compensation particularly focusing on reconciling social and ecological conflicting interests
- Conceptual framework based on theoretical analysis

### **Chapter 3 : Ecological compensation in the US practice**

In this chapter, it is explained ecological compensation of road development in practice based on the implementation in the United States. In general, the contents of this chapter as follows :

- The sustainability target in US policy
- The ecological compensation in road development practice
- The strategies or approaches in the implementation of ecological compensation including the strengths and weaknesses in reconciling social and ecology conflict

### **Chapter 4 : Current Condition in Indonesia**

In this chapter, the current condition related to environmental policy in Indonesia is elaborated. By discussing the existing positive points related to ecological compensation concept, it may be figured out what the challenges might be found in the implementation of the concept. The general contents of this chapter will discuss:

- Environmental planning in Indonesia related to environmental performance especially ecological compensation : policy and practice
- The challenges that have to be coped with when ecological compensation is implemented in Indonesia

### **Chapter 5 : Towards ecological compensation in Indonesia**

This chapter describes the comparison analysis of road planning and environmental practice between US and Indonesia regarding to its policy, actors involved, and procedures. Based on this analysis result, it will be measured to what extent the policy of ecological compensation can be transferred to Indonesia. The contents of this chapter consist of:

- Lesson learned of ecological compensation strategy from US for Indonesia focusing on reconcile social and ecology conflict goal (interest)
- Contextual analysis to measure the possibility of ecological compensation concept to be implemented in Indonesia
- Major issues to be highlighted in the implementation of ecological compensation in Indonesia
- Potential approaches used as instruments in the implementation of ecological compensation

## **Chapter 6 : Conclusion and Recommendation**

This chapter provide conclusions and recommendations with some adjustment from lesson learned to Indonesia condition by discussing general issues such as:

- The possible strategies of ecological compensation that should be implemented in Indonesia
- Further actions regarding to opportunities and limitations for the implementation of ecological compensation in Indonesia

## Frame of thought and Report Structure

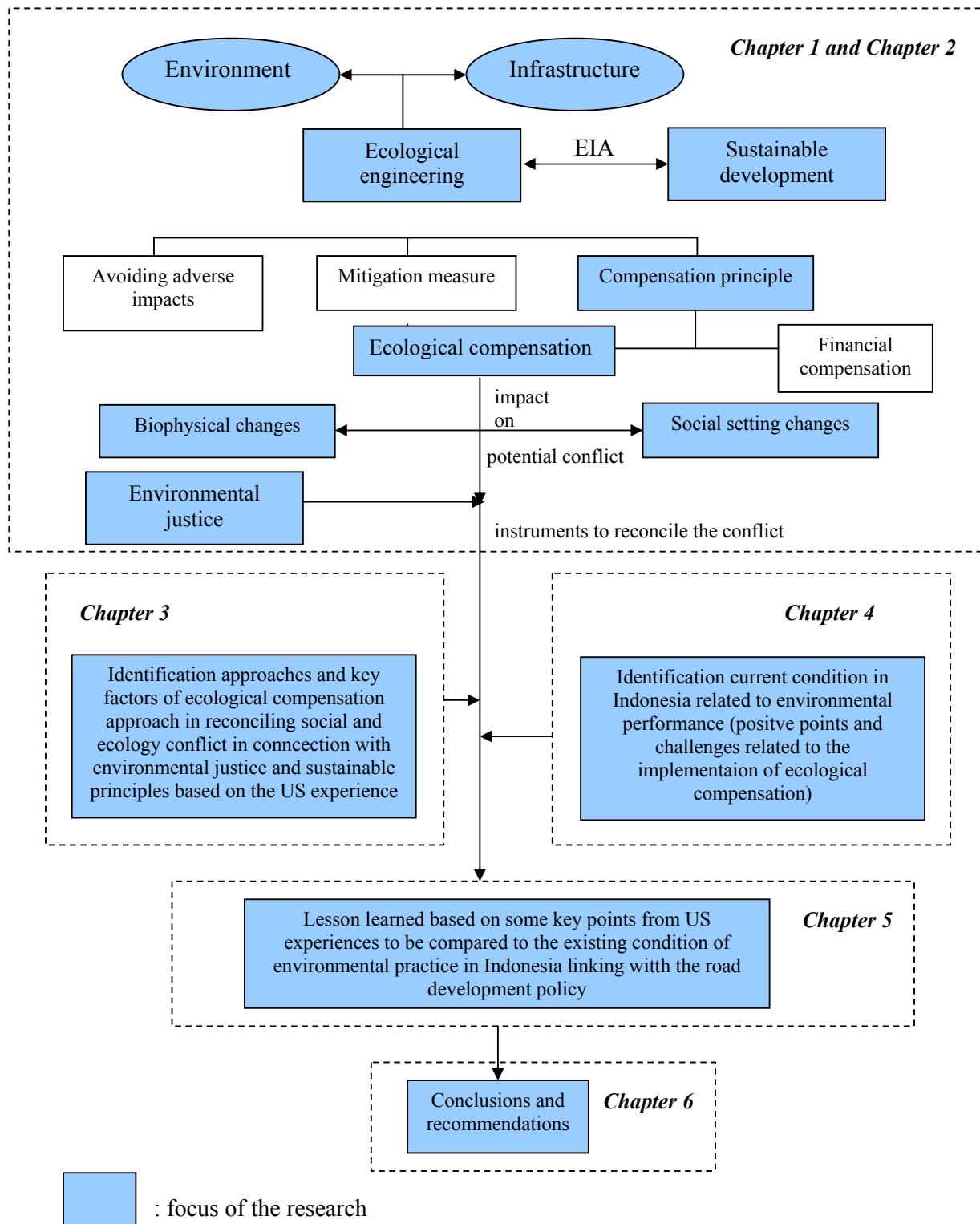


Figure 1. 4. Frame of thought and Report Structure

## **CHAPTER 2**

### **THEORETICAL FRAMEWORK**

#### **2.1 Sustainable Development, EIA, Ecological Engineering**

Since Rio Summit in 1992, the principles of sustainable development have become prominent agenda in environmental policy and related projects. Even though there are many understandings derived from it, the Brundtland Report explicitly stated that the main substantive of environmental sustainability in development is the attempts to meet the needs of present generations without compromising the ability of future generations to meet their own needs (WCED 1987 in Haughton 1999). It means that the sustainability of the environment is not only intergenerational matters between future and present generations but also for intragenerational equity dealing with localities and social issue in present generations (WCED 1987 in Ring et. al 1999). Currently, there is an increasing of awareness to bring the sustainability concept to be more effective, comprehensive, and integrated. It is particularly reflected in the decision making on important policies or projects by considering economics, social and ecological factors (Gibson. 2006).

However, the sustainable development as such is not an easy task to be achieved. In many cases, the development activities of an area are more likely to have conflict with the environment. According to Mitchell (2002) one of paradox within sustainability efforts is between technology and culture. Technology can be considered as a solution on one hand, but on the other hand it can contribute to environmental degradation e. g in road development case. As a result of this effect, environmentalist has a tendency to be 'projects killers' of many infrastructure projects, even though the projects are proposed for positive objectives such as the increasing of economic growth. However, the higher economic growth, the higher activity and demand of road utilisation that led to negative impacts such as congestion, high pollution and a higher conversion larger space for the expansion of roads.

The negative impacts caused by road development deal with short term and long term impacts. It is not only lead to water pollution, noise and air pollution because of the emission from vehicles, a higher mortality of native species. Roads development also leads to more remote consequences such as a decline in biodiversity of species

affecting its ecosystem structure. The impact to ecosystem heavily is because the effect of roads development on fragmentation in landscape that inhibits the movement and interaction of species, and destructs their habitat. In short, economic and environmental interest is still debatable in a road plan, and it is a challenge for achieving sustainability in road planning. According to Campbell (1996) in Randolph (2004 pp. 12), planning in the field of sustainability will involve resolving conflicts efforts between economic, environmental and social objectives and interests : between economy and environmental is the ‘resource conflict’, between economy and social equity is the ‘property conflict’, and between social equity and environment is the ‘development conflict’.

Therefore, many studies are conducted to accommodate the interests between environmental, social and economic interests. An environmental design and planning such as environmental assessment and environmental audit method is one of studies developed to decrease the impact to environment. Environmental Impact Assessment (EIA) is one of the prominent requirements for many infrastructure projects. In the United States, it was established through National Environmental Protection Act (NEPA) in 1970 (Arts 2004). Meanwhile the EIA in Indonesia was recognized in 1982 by means of Act No. 4/1982 that refers to Basic Provisions for Environmental Management (Purnama, 2003). According Rundcrantz (2007), “Environmental Impact Assessment (EIA) is an instrument to safeguard the treatments of environmental impacts within development planning”. Moreover Arts (2004) defines EIA as “an instrument planning and decision-making, oriented to the provision and evaluation of information about environmental effects of development proposals...”.

Given the vague and ambiguous concept of sustainability and potential conflict in development, EIA becomes a practical instrument for the government to provide environmentally-sound decision making for achieving sustainable development goals (Ortolano and Sheperd. 1995). The EIA procedure plays a role in influencing the relationship between development and the environment to be a more sustainable management for sustainable goals (Glasson *et al.*, 2004 in Rundcrantz, 2007), and it may be an important instrument for the implementation of environmental consideration in projects planning and society (Fischer, 2003; Larsson, 1999 in Rundcrantz, 2007).

Since 1990s, the literatures of EIA have taken the term of ‘environment’ in broader understanding for EIA analysis (Ortolano and Shepherd. 1995). Meaning, the ‘environment’ assessment is not only for natural environment, but also for social

impacts. As potential sustainable instrument, the assessment should be undertaken in an integrative manner within an ecological framework (Gardner 1989 in Lawrence 1997). Large-scale (e.g. national and global) and long-term (e.g. future generations) effects on social, natural, and economic systems should be addressed (Lawrence 1997). These are the reasons to include the social consideration into planning and policy evaluation, termed as Social Impact Assessment (SIA) as integral part of EIA. However, in practice, EIA is often only concern to impacts on biophysical environment and frequently left out the significance of social impacts caused by plans or projects proposed (Ortolano and Shepherd. 1995). This social impacts will be mainly discussed further in next sections as the main issue of this thesis.

One of main outputs from the procedure of EIA study is the alternatives of locations, mechanisms or technologies used in implementing projects to be more environmental friendly. For infrastructure projects, one of alternatives proposed is to mitigate of negative environmental impacts using technologies such as by constructing bridges, viaducts, tunnels. These alternatives may incorporate the road with other purposes into more integrated landscape to be functional (Arts, 2004). Those alternatives can be better solutions to reconcile the conflict between economics actions and environmental considerations.

Those alternatives are reflected in ecological engineering concept by means developing efforts and technologies for making better design to reduce environmental impact caused by road development. Ecological engineering as precautionary approach develops a mitigation design aiming in avoiding and reducing adverse impacts of environmental disturbance, habitat fragmentation, pollution, drought on plant-animal populations and ecosystems structure vibration due to the creation and use of roads through technical works. This design can be a better solution for bridging economic and environmental interest in road development.

### **2. 1. 1 Principles and methods of ecological engineering in road development**

There are several understandings of ecological engineering. Odum (2003) defines ecological engineering as “the practice of joining the economy of society to the environment symbiotically by fitting technological design with ecological *self design*”. Mitsch and Jørgensen (1989) in Mitsch (1998) define ecological engineering as the design of sustainable ecosystem integrating human society and the natural environment

and it will give benefit for those two elements. Furthermore, Mitsch (1998) frames ecological engineering in combination of basic and applied science for the restoration, design, and construction of terrestrial ecosystems aiming in the restoration of ecosystems that have impacted by human activities such as environmental pollution or land disturbance; and the development of new sustainable ecological systems linking human and ecological value.

Furthermore, Bohemen (2004) argues that ecological engineering is proposed to make clearer the (in) direct relations between human actions and nature and then (re)connect human with natural process in order to minimize negative environmental impacts and to protect biodiversity. Moreover he explains that one of important element in such relation is the possibility to reduce adverse effects of human actions on nature by adopting mitigation measure.

The different point of views and cases of environmental problems results in different names and emphases of ecological engineering such as ecosystem restoration, ecotechnology, nature restoration, etc. However, there is mainstream distinction of the fundamental concepts of ecological engineering and other engineering fields are as follows: (1) self-design (self organization) is a cornerstone; (2) the field involves biological systems; and (3) sustainable ecosystems are the goal (Mitsch 1998).

In reducing the effects of road and traffic on the environment, ecological engineering concept plays a role in road planning, design and construction by mitigating measures to eliminate or reduce effects on environmental values (Bohemen et al. 2005 pp. 233). Moreover, Bohemen et al (2005) explain that in planning phase, the impact of road can be reduced through better route-planning and the more effective use of the existing infrastructure. It can also be reduced trough long-term follow up studies and environmental impact reports so the effects and measures taken can be appropriate. In design phase, an integrated design approach can be applied. In construction phase, the scope of ecological engineering work includes the development of fauna-passages and the construction and maintenance of roadside verges as efforts for the conservation, restoration and development ecological values. However, if there are some negative effects that cannot be avoided afterwards, compensation will be another design option to offsets ecological values loss (Bohemen et al. 2005 pp. 233&238)



## **2. 2 Ecological Compensation Concept**

### **2. 2. 1 Ecological compensation as an alternative in environmental management**

It has been realized that the negative impacts of road projects to environment are never be fully be avoided (Cuperus et. al. 1996). Therefore, EIA study often state compensation as the last alternative that can be taken for offsets environmental impacts in which the impacts cannot be managed with other mitigation measures. To determine what the best alternative should take, EIA study involves some mitigation measures to deal with adverse impacts of road projects. Any proposed alternative is explored as the efforts to decrease or to curtail the negative impact on the basis of the priority principles: *prevention is better than mitigation, which is better than compensation*. Ortolano and Shepherd (1995) stated that the most common outcomes of EIA are recommendations to use 'prevention and minimizing' measurement to reduce the environmental impacts of some proposed plans. Meanwhile the compensation alternative to offset environmental destruction caused by a project is generally regarded as the least desirable option of mitigation measure. However, compensation is a substantial part of alternatives offered by EIA study to achieve no net loss goal.

According to Cuperus et. al. (1996) no net loss means that the losses of any part of Earth' land because of any human intervention, has to be balanced in another place whether nearby to the projects' location (in-site compensation) or off-site compensation. Based on the statement in The 'Structure Plan for the Rural Areas in The Netherlands' "...when nature, forestry and/or recreational functions are to suffer demonstrable damage as a result of another important societal function, the effects should be mitigated and (if such is not sufficiently possible) compensated.." (LNV and VROM, 1993 in Cuperus et. al. 1996). The statement encourages no net loss principle in environmental management due to many roads projects (Cuperus et. al. 1996). The application of no net loss principles due to loss of habitat caused by road projects associated with the creation of habitat patches area (see table 2. 1).

**Table 2.1 Compensation measures on road impact**

<b>Impact of road construction and use</b>	<b>Compensating measures toward 'no net loss'</b>
Loss of habitat	Create new habitat patches
Fauna road kills	Improve existing habitat patches
Barrier effect	Increase habitat patches
Disturbance by noise	Increase quality of affected habitats
Disturbance by light	Increase quality of affected habitats

Source : Bohemen et al. (2005) pp. 244

However, in road plan, the implementation of ecological compensation has positive impact and negative impact as well. Positively, road plan still can be proceed with lower effect to the environment by using mitigation measures. However, negative (secondary) effects from ecological compensation may be occurred, particularly on society. It may be inevitable that ecological compensation cause impact on society. Ecological compensation in practice might involve the change of present land use e. g. from agriculture or industrial area to nature protected areas. The land that previously has been used as agriculture or industries is change to conservation area to compensate the loss of nature area that already had been used for road. The conversion of land use cause impacts on present social settings and their employment. The farmers will loose their land and their occupation for living because their land becomes compensated area that is restricted from human activities.

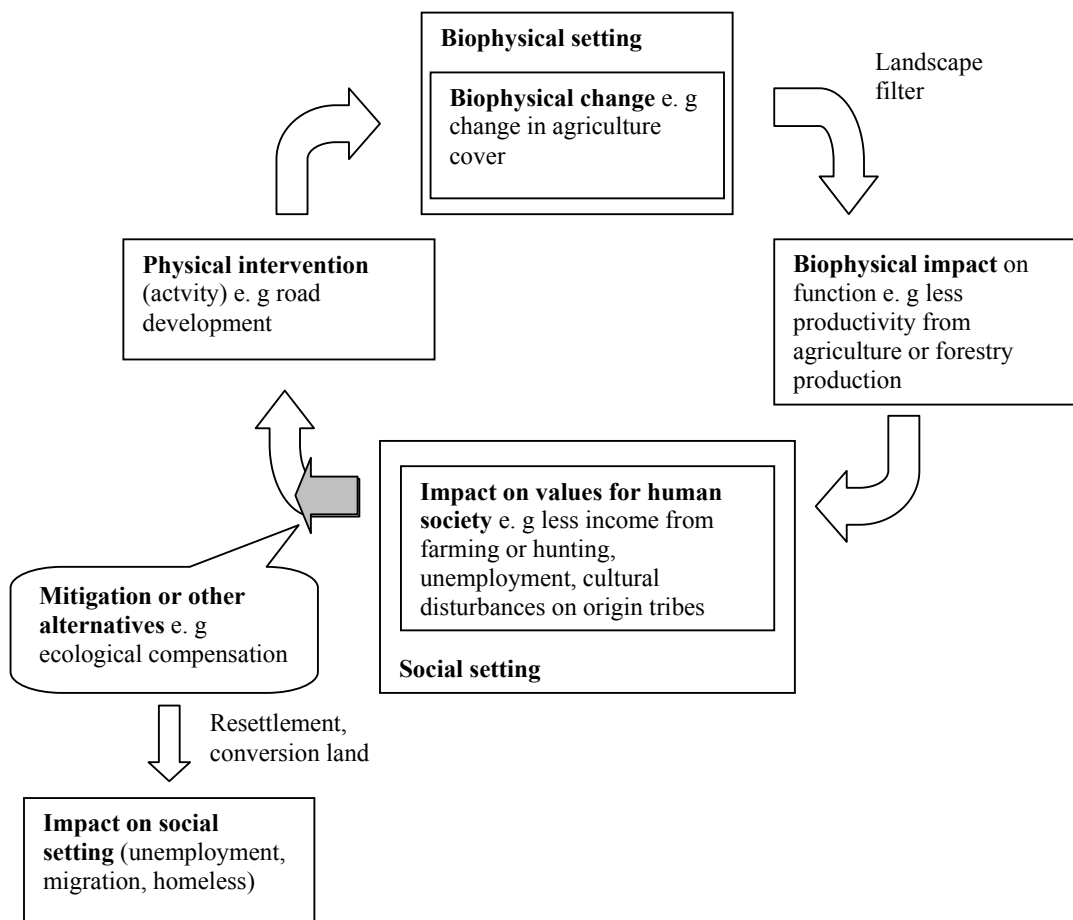
### **2. 2. 2 Social issues in ecological compensation application**

Ecology system is integrated system between human (society) and environment. Yet, in planning practice these elements are treated separately. As Hinchliffe and Kath (2004) argue that it is frequently thought to make separation between nature and society and “we tend to treat nature and society as opposites”. In addition to the argument, Wheeler (2004) argues that many of visionary planning ancestors have been done efforts to reconcile goals of environment, economy and equity, but unfortunately, in practice these objectives have become separated. In nature area management, they describe that if something is treated as natural system that has to be preserved, then, we tend to think the area become restricted and undeveloped. It may not related to society

and there is no reason to consider about it. In line with this argument, Slootweg (2001) argues that the assessment of impacts on environmental, social and economic cost-benefit analysis are conducted in different space. In fact, feedback from society as response of their environmental condition can reduce the uncertainties on ecological system. By understanding and integrating the social value, culture, and norms, the efforts in environmental planning and decision making will be managed effectively (Randolph. 2004 pp. 7)

According to Slootweg (2001), there are two sides affected by physical intervention. Biophysical (nature) settings and social settings are influenced each other. Human interventions to environment cause impacts on biophysical settings such as environmental degradation, and thus change the value of environment function for human society. Meanwhile, the environmental act such as ecological compensation to reduce environmental vulnerability from degradation, also has impact on society. By resettlement of conversion landuse from productive land to restricted land may change social structure (see figure 2. 1). This interlinks has consequence to make integrated impacts review on any planning interventions.

Moreover, Wheeler (2004) gives an example that has correlation with the impact on ecological compensation in practice : “Local environmentalist have often bought into ‘slow growth’ movements without realizing that without accompanying efforts to promote affordability housing these would exclude lower income residents and generate inequities”. Many interpretations believe that scientific method e. g. natural or biodiversity preservation measurement that heavily ecocentric is sufficient to reduce conflict, complexity and uncertainties in natural system. However anthropocentric also take important role because social and ecology matters are linked each other. If one element is missing in an environmental management effort, true sustainability will remain intangible (Randolph 2004 pp. 12) and it has potential to raise conflict between environmental and social interest. In fact, the final goal of sustainability is not only ecological sustainability but also socially and economically.



**Figure 2. 1 Steps in determining impacts resulting from physical interventions**  
(source: Slootweg. 2001 and modified by author)

The social issues involved in the implementation of ecological compensation are related to social equity and justice among present generations' issues, especially on affected local communities. Social equity or social justice is an important element to achieve sustainable because unfair distributions of income and social benefits will become lasting issue to be discussed in the future. According to Munasinghe (2001) "equity is ethical and usually people-oriented concept with primarily social, and some economic dimension". This term also can be assessed on distributive justice of Rawls (Munasinghe. 2001) that defines justice as the ability of present and future generations to meet their own needs (Hooft, 1999).

Looking at these facts, it may be indicated that there is potential to have conflict between ecocentric and anthropocentric views or between intergeneration and intrageneration equity issues in the implementation of ecological compensation.

Ecocentric views that incorporate in many sustainable development strategies such as ecological compensation have often been interpreted as the means to meet future generation needs (intergenerational equity). However, if natural resources are restricted to be used based on reason for preserving future demands, it may restrain present generations to meet their needs (intragenerational equity issue) that related to anthropocentric perspective. This potential equity conflict issue should be brought into agenda in creating sustainable development strategy (Mitchell. 2002 pp. 81). However, relatively new topics such as justice or equity in environmental issue have yet to be thoroughly integrated into environmental planning (Wheeler, 2004).

To deal with conflict that might be emerged from ecological compensation policy, sustainable efforts are needed to be taken to more socially. It will involve new ways to encourage the provision of sustainable goods and services that should meet people needs while ‘the conservation of natural resources’ has also been introduced at the same time (Turner, 1999), for example by securing the wealth of local communities when their agriculture land are converted to conservation area. Furthermore, Randolph (2004 pp. 12) argues that by resolving these objectives and interests, communities become “green, profitable, and fair”.

### **2.3 Environmental justice concept**

Mostly natural resources and environmental management is increasingly concerned in allocation and governance matters. This is related to the issues in many environmental management researches that poorer and minority communities have larger disadvantages from environmental degradation than its benefit. They also lack of access to get legitimacy of environmental rights from state government. As the consequence of economic and environmental problems in those poor neighbourhoods, the people who lived there are more vulnerable to health threat. Inequity or unfairness in distributional and procedural of economic and environmental service cause poor and minority groups are marginalized from better condition to live. Hence, the ideas of justice in environmental issue are now a very prominent feature of discussions on environmental sustainability, but however the concept of environmental justice is not clear-cut defined (Solitare and Greenberg. 2002).

Many studies related to environmental justice are identified from the cases in US. Regarding to diverse communities in US with many ethnic and cultural groups, there are potential of conflicts because of unfairness in the distribution of environmental impacts. Environmental justice concept that emphasize on public health, social inequality, and environmental degradation becomes a framework for public policy debates arguing the impact of the discrimination of environmental health.

The term environmental justice relates to some understandings of ethical system that implies value judgement of desirable environment and quality of life associating with the impact on the welfare of future generation (posterity) (Hooft. 1999). This understanding is inspired by a theory of justice by Rawls (1971 ed. 1999) that justice is about fairness conceptions of justice in general and distributive justice in particular that extends to intergenerational justice. Even though he does not explain explicitly about theory of intergenerational justice and intergenerational beneficence measurement, he uses the term of ‘just savings’ which was designed to distribute benefit or resources justly among generations, people alive today’s interest and future generations. However, in these understandings, ecocentric view may take more position to be concerned in connection with safeguarding welfare of future generations (intergenerations equity).

Furthermore, other authors differentiate environmental justice on more socially sound understanding. In addition to the perspectives before, Corburn (2002) argues that environmental justice is about both distributive and procedural fairness. It means that justice in environmental issue is not only deal with equitable distribution of environmental damages or its benefits, but also it is related to the incorporation of low income and minorities in decision making process (Kuehn in Monsma, 2006). This statement is supported by his opinion that, environment justice links between human rights and the environment, and it can be addressed only when a company or government committed to ensure that all of affected communities have an equal degree of consideration and protection from negative environment and social impact (Monsma, 2006). In line with that, The U.S. Environmental Protection Agency (EPA) defines environmental justice as the “fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies.” (Zaferatos 2006).

Particularly, Haughton (1999) distinguishes five interconnected equity principles that move to center place in any discussion of sustainable development, representing the

essential environmental justice dimension of the concept. This initial analysis provides the beginnings of a normative framework for environmental justice.

- Intergenerational equity. It is taken from the Brundtland definition of sustainable development as being “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987 in Haughton 1999).
- Intra-generational equity or contemporary social equity or social justice in more general.
- Geographical equity that concerns to issue in different level of scale, from local to global and from pollution problem to forests degradation.
- Procedural equity that holds regulatory and participatory systems as framework for ensuring that all people are treated openly and fairly.
- Inter-species equity placing the survival of other species and human in the same level.

It can be generalized from these equity principles in sustainable development that sustainability has range from anthropocentric views on the first principle to ecocentric views in the fifth principle.

### **2. 3.1 Environmental justice in ecological compensation**

These theories contribute to development of environmental management concept in practice such as ecological compensation for road development projects. Ecological compensation, as explained before, is not only as an efforts of nature preservation, but it is also deal with people’s life affected that live nearby the project and in the targeted compensation area. This issue is relevant with duty and rights between human and nature. Haughton (1999) argues that in environmental management practice, nature has the rights to be preserved and humans have obligations on it to be sustained. Moreover Turner (1999) argues that environmental policy instruments and institutions should be supported by an ethical appraisal addressing the role and rights of present generations to maintain environment system, hence it can meet the needs of future human generations and non human species.

However, it should be noticed that no matter how well the environmental instrument and institution is, it is nothing without the persistence efforts for social life. Even though ecological compensation can be a successful mitigation tool to reduce

environmental impact, it may rather questionable as sustainable policy if it gives disadvantage for sustainability of social life especially for poor people and minority groups. In short, any planning of human intervention has to be regarded as two sides of equity issues, social and ecological to achieve environmental sustainability.

Solitare and Greenberg (2002) argue that in general people define environmental justice from three prospects which are *economic*, *environmental*, and *social process* (e.g., legal, political). Economic prospects are measured by the number and type of jobs, tax, or improvement in infrastructure (Bryant. 1995 in Solitare and Greenberg. 2002). The environmental approach sees environmental justice as balancing benefits and restriction, better environmental health, and overall improvement in the quality of life (Bryant, 1995; Lavelle and Coyle 1992 in Solitare and Greenberg. 2002). Meanwhile, process perspective sees environmental justice as empowerment in which there is a legitimization of community perceptions, or an increase of minority participation in decision making (Bullard. 1992 in Solitare and Greenberg. 2002). The prospect of process is related to social issues that needed to be concerned in defining justice in environmental issues. In defining the justice, it associates with some questions such as who does get being affected, who is get benefit from ecological compensation, what is condition that being indicated unfair, etc that related to different social preferences. To answer these questions or to achieve 'fairness' distribution of environmental benefits and impacts, it may be achieved trough participation and legitimization social preferences as consensus agreed together. Hence, the 'process' is the means to make social values and preferences to be recognized.

These environmental justice elements give more supporting ideas to strengthening the concept of ecological compensation to be more socially sound with respecting on both perspectives, ecocentric and anthropocentric. Inspired from many perspectives on sustainability and environmental justice concept, it raises the idea on *socio-ecological compensation concept* as the main issues discussed in this thesis. The socio-ecological compensation termed here means that *the concept of ecological compensation with respecting on social issues, particularly on affected groups, to take into account to the management.*



## **2. 4 Strategies in the implementation of ecological compensation**

Over the last few years, it has been increasing interest of groups, private and public, to compensate the land taken for projects in dealing with the remaining effects after mitigation. For example in Canada, Canadian government to protect the wet land through wetland mitigation measure in protecting wetland fish and wildlife habitat (Rubec & Hanson 2008), or in US through environmental impact mitigation plan on highway project in Lexington, Kentucky (Bourassa 2006), and environmental compensation in Swedish road development (Rundcrantz, K 2007). Compensation principle also has been applied in Dutch highway planning toward 'no net loss' goal (Cuperus et. al, 1996) through in kind compensation due to the loss of habitat and the partition of precious natural habitat that become main issue in road projects in the Netherlands (Arts, 2004).

Ecological compensation has applied though different schemes in different places. There is no general standard compensation has to be performed. As Cuperus (1999) stated that there are no general standards and guidelines for choosing between different approaches, it depends on the availability of suitable compensation sites so that it is treated case by case. Even though there are also other countries experiences in ecological compensation, the US experiences in ecological compensation will be highlighted in the more detail discussion as the focus of this thesis.

In general, the approaches in ecological compensation have the same objectives in reducing impacts to environmental and preserving nature area. However, those are performed by different institutions and in different circumstances. Potentially, the differences may result in the different strengths and constraints faced in the implementation of ecological compensation.

There are two main approaches that have been developed in US as ecological compensation tools: in lieu arrangement (i. e land trust) and mitigation banking. In general, both approaches in ecological compensation have the same objectives to offsets nature loss and preserve nature area. However, those are performed by different institutions and in different condition where mitigation banking is managed by sponsors that often from private entities while land trust is mostly managed by non profit organizations or government institutions. Potentially, the differences may affect to approach in the implementation of ecological compensation in practice in certain ways.

The 'what' and 'how' questions will be discussed further in this thesis connecting to the differences of those approaches in managing ecological compensation and conflict issue-related. As the introduction, the issues involve in different approaches will be discussed in this section. Nevertheless, the more detail explanation about the approaches will be discussed in chapter 3.

#### **2. 4. 1 Land trust in US**

A land trust is a non-profit organization created to preserve land for some public purposes. In these such organizations, most of the directors board members of the land trust are members of the community in which the land trust operates (Silberstein, W. M and M, Beck. 2002).

There are two strategies are developed through land trust approach: for nature conservation purposes or conservation trusts and for preservation of affordable housing by maintaining the price excluded from market mechanism or community land trusts (CLT) (Campbell and Salus, 2003; Encyclopedia of the City, 2005). Both type of land trusts use the same land-saving tools which are mostly by purchasing the land, but for different purpose. Conservation trusts rely mainly on purchasing land or land rights in purpose to preserve open space or protect ecological resources. Meanwhile, community land trusts acquire land to be managed to ensure long-term access on affordable housing or community resources.

Even though CLT concept is especially related to housing provision, it is still interesting to be discussed in this thesis because of some reasons:

- Sometimes, the implementation of ecological compensation has to deal with the resettlement of local communities to other places. Here CLT may take a role to accommodate the housing needs of resettled of communities.
- The approach of CLT has positive way to be considered. It involves more participation of communities especially affected ones in land management and control of land use.
- CLT also offers long term management that safeguard local communities to get easier access on their basic needs on land and social life in which it is not only for present generations but also for future ones.

Hence, the approach implied in this concept may be important towards more socially sound of ecological compensation in practice.

For conservation purposes, land trust can make some land purchasing to be protected areas for nature preservation especially land or areas of rare or endangered species (<http://www.worldlandtrust-us.org/about/index.html>) using financial resources from donation, government grants or from their own self sources (self-financed). Conservation easement<sup>5</sup> approach is another means for achieving the environmental protection purposes. By this approach a land trust organization make an agreement with landowner. The agreement regulates the ownership that retains to landowner while the landowner gives an easement to land trust by preventing specific development on the land or maintaining the current use of the land (encyclopedia of the city. 2005). By this approach, land trusts has authority to hold conservation easements with corporations and investment groups to compile large areas of land, and with individuals to keep their property being private goods However, they also have to avoid providing several other benefits by making some land use changes.

However, an established Community Land Trust mainly aims in providing house for low income people and maintaining affordability particularly for affected community by road development or other physical development. The housing provision is managed by combining public and private interests, the land and housing are owned by the private while there are developed techniques to maintain affordability (Davis, 1994 in Bourassa, 2006). To achieve the goals, the trust may purchase the land or existing housing or develop new housing for low income (Bourassa 2006). Afterwards, the houses built can be owned or rented to low income occupants by leasing it in the long-term, while the CLT usually owns the land. Moreover, CLTs usually retain rights to buy buildings from residents who move out of from the community to avoid speculation. Hence, by these efforts, the prices of land and housing are protected from market, and these allow people in compensated area to obtain equity. The de-commodification of housing and the limited of additional property capital from re-sale and rent costs are other approaches used to maintain the housing prices at lower level (Bourassa 2006). The trust may offer an alternative to keep social life sustainability in compensation area.

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<sup>5</sup> In law view, easement is defined as the privilege of using something that is not your own (as using another's land as a right of way to your own land)

## **2. 4. 2 Mitigation banking in US**

Another approach developed as ecological compensation tool in US is mitigation banking. Mitigation banking is another voluntary conservation activity that is designed to compensate impacts or unavoidable damages to biodiversity caused by development activities (Burgin 2008). This approach has developed in US as a response to wetland loss caused by development aiming in protecting of wetlands on public and private lands that has impact to water quality.

The mitigation banking mechanism is initiated by generating ‘biodiversity credits’ as incentives to landowner who commit to enhance and protect biodiversity values on their land. Then, these credits can be sold to compensate likely impacts on biodiversity values due to development. In other words, conservation land owners or bank owners may ‘sell’ credits to the Corps of Engineers as manager in mitigation banking policy, while developers or others who need to compensate for the environmental impacts of their projects can ‘buy’ the credits for compensation (United States Fish and Wildlife Service. 2004 and Randolph 2004 pp. 547).

In addition, the concept offers benefit not only for species and natural habitat, but also for developers and public or community (United States Fish and Wildlife Service. 2004). Conservation banks provide a simple, economical alternative for developers and other project proponents. A one-time purchase of credits saves developers time and money and provides regulatory certainty at the same time. Community also get benefit from the credits of their efforts to protect open space and natural habitat.

## **2. 4. 3 Other countries related experiences**

A kind of mitigation banking has also developed in Australia, recently the legislation passed by the New South Wales government. The Threatened Species Conservation Amendment (Biodiversity Banking) Bill 2006, provides an additional mechanism in the ‘tool kit’ to address biodiversity loss allowing for negotiation for ‘biodiversity banking and offsets’ called BioBanking (DEC 2006a in Burgin 2008). Developing biodiversity offsets has been seen as a method for governments to meet their commitments under the Millennium Development Goals and the Convention on Biological Diversity (Burgin 2008).

In Sweden, compensation focuses mainly as a tool for the preservation of biological diversity. As recommended by the Ministry of the Environment in 1997, compensation measures may be acquired in compensating a severe loss of environmental values in certain protected areas, for example nature reserves (Rundcrantz, 2006). Different with US and Australia, even though some mitigation and compensation efforts has become one of environmental protection agenda, it is apparently no third party involvement like land trust or mitigation bank sponsor.

These experiences imply that ecological compensation concept also has been developed in other countries with some adjustments due to different condition in practice. However, the thesis makes the United States experiences as the main core of the discussion.

## **2. 5 Developing socio-ecological compensation by linking to environmental justice principles**

There are some issues related to ecological compensation, two of them as the focus in this thesis are sustainable development as the target in road development, and environmental justice as integrated considerations in the practice. As Rundcrantz (2007) stated that ecological compensation is a potential tool that useful for achieving a sustainable road planning. Meanwhile, sustainability itself relate to three different but interdependent forms and ethical perspectives. A sustainable society and environment should be ecologically sound, economically viable, and socially just (Milbraith 1989 in Lawrence 1997)

In most cases the justice issues are often marginalized in particular development related to physical interventions. Developers or governments just move-out community in project area without considering the continuity of their life. As Syme and Nancarrow (2002) argue that “justice issues seem to have only been included as a response to community action rather than the formal input of social justice theory or data gathering. There is relatively little record of these ideas being successfully applied to specific environmental policy problems”.

Corburn (2002) argues that environmental justice is about both distributive and procedural fairness. Moreover, Robert Kuehn, defines distributive justice as the *"equitable distribution of the benefits and burdens of environmental hazards or the*

*benefits of environmental protection*” and equity concerns with “*procedural fairness means that environmental justice extends to exclusionary and restrictive practices that limit participation by people of color in decision making boards, commissions, and regulatory bodies.*” (Monsma, 2006). So that, in environmental justice conceptions, those deal with equal environmental sustainability distribution and participation encouragement. These issues have connection to the issue in the implementation of ecological compensation.

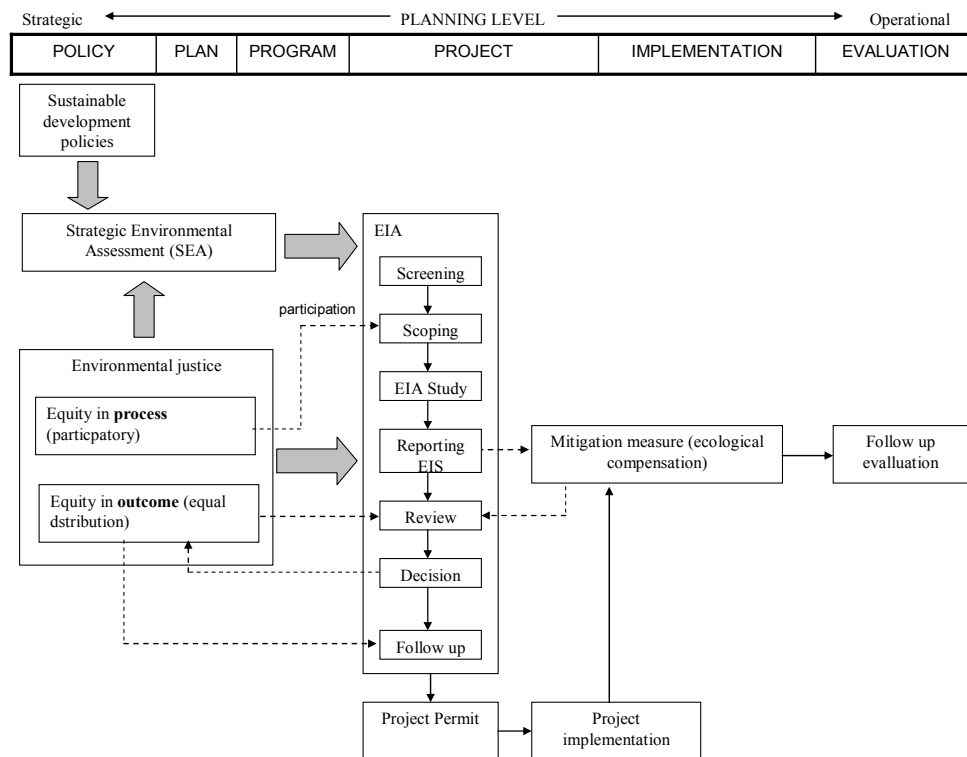
Taking social and ethical issue in the implementation of ecological compensation strategy, it has been realized that the discussion of sustainable elements of life (environment, social and economics) can not be isolated each other. The ecological compensation concept should take into more broad perspective in which it is not only about environmental protection but also social life improvement. As Gosselin (2008) stated the knowledge development in ecological performance has been directed to broader purpose, it is not only for preserving ecological quality but also improving quality of life (socially sustainable). This perception becomes stronger to be considered. It is supported by the phenomenon of sustainable development that has been developed towards more environmentally sound and socially equitable of life to anticipate the changes in relation ecological, economic and social systems (Ring et. al.1999).

Sustainability of road project in environmental and social life is supported by practical tools to help the integration between environmental and social-economic considerations in the earlier level of decision making process, for example through environmental assessment (EIA) procedure and ecological engineering. By thoroughly monitoring mechanism after the implementation of project as an integrated part of EIA, the mitigation measure can be ensured to be accomplished. According to Wahaab (2003), there are some purposes of environmental assessment process:

- Supporting the goals of environmental protection and sustainable development,
- Integrating environmental protection and economic decisions at the earliest stages of planning and policy making,
- Predicting environmental, social, economic, cultural consequences of a proposed activity, and assessing plans to **mitigate**, including compensation, the adverse impacts of it

- Providing an area for public involvement, government institutions in the review of proposed activities. *Instead of attempting to reduce impacts to environmental, it should be also not harm to social and culture life.*

In addition, because environmental management deals with environmental and social values within, EIA as one of tools to promote sustainable development should be developed to be more integrated with environmental justice and equity issue regarding to environmental, social and economic consequences resulted from human interventions. Hence, the technical measures of EIA procedure and equity elements have to involve in determining alternatives to reduce negative environmental impacts (e.g ecological compensation) and in releasing permit of road projects process. The relation among them can be seen in figure 2. 2 in a frame of planning process.



**Figure 2. 2 Sustainable development, EIA, and ecological compensation in planning process frame**

Moreover, ecological compensation in more sustainable way is not anymore as sectoral strategy, but it becomes integrated approach with holistic perspectives. It means that in ecological compensation concept, it involves a consideration of ecosystem and the people surroundings by assessing both positive and negative implications of human activity. In other words, it is not only focus on environmental implications but also in

social, cultural, and economic aspects and their inter-relationships (Gibson 1993 in Mitchell 2002). The assessment is driven by a goal of improving and maintaining human and ecosystem well-being together (Hardi and Zdan. 1997).

In achieving environmental justice and sustainable development, basically, planning has two important dimensions: content and process. Hardi and Zdan (1997) explain that the holistic nature is reflected in terms of both **content** (dealing with health and human well-being, environmental conditions, the state of the economy, community resiliency, the value household, voluntary and subsistence activities, and government accountability), and **process** (a collaborative, consensus seeking appropriate approach and in the continuing work it considers a broad public discussion).

In conclusion, in developing ecological compensation in road development to be more in sustainable way discussed in this thesis, it is proposed some key points as content and process dimension reflection relating to environmental justice and sustainable development principles. Those may to be considered in application of ecological compensation as an attempt to reconcile the conflict between ecology and social interests by considering **the six key components necessary for achieving sustainability in social and environmental** (Hodge. 1997; Lawrence 1997; Morello-Fosch, 2002; Gibson 2006):

- a. Ecological targeted-performance (environmental goals, site selection process);  
Scientists agree that successful mitigation is determined by the ability of a created or restored wetland to provide the biological, hydrological, and biogeochemical functions of the original wetland or a natural reference wetland (Erwin 1990a, Erwin 1990b, Kusler and Kentula 1990, Mitsch and Gosselink 1993, IWR 1994 in NCSU). This indicator may be represented some insights of environmental considerations in the practice of ecological compensation.
- b. Government direction or policies (clear vision, goals and strategic direction);  
The clear regulatory related to legislation, guidelines and institutional arrangements involved in planning and decision making which regulate who will do what and who are responsible for what, allocation and finance mechanism, stakeholders involved, etc
- c. Co-ordination (among government agencies, among different interest groups in society, and private parties);



- d. Public participation (in government planning and decision-making processes);  
Realizing sustainability will, to some degree, involve balancing and integrating the overlapping and interdependent values (Sadler 1990 in Lawrence 1997) or systems (Barbier 1987 in Lawrence 1997). Moreover, Morello-Fosch et al (2002) argues that community participation is a key for long-term regulatory enforcement and development initiatives that are politically and economically sustainable. Hence, the involvement of public participation since the early of planning stage is important.
- e. Dispute resolution (mechanisms for preventing and resolving disputes);  
The approach must be must also be viewed within the broader context to incorporate environmental and social concerns into planning and decision making and to link and reconcile environmental, social, and economic perspectives. This is important to make integration between environmental impact assessment (e.g ecological compensation) in practice and sustainability goals (Lawrence. 1997).
- f. Independent oversight (the capacity to independently assess progress achieved with implementation).  
Sustainability assessment process must apply the process of monitoring aiming to learn from the result and making suitable adjustments through implementation of improvement (Gibson. 2006)

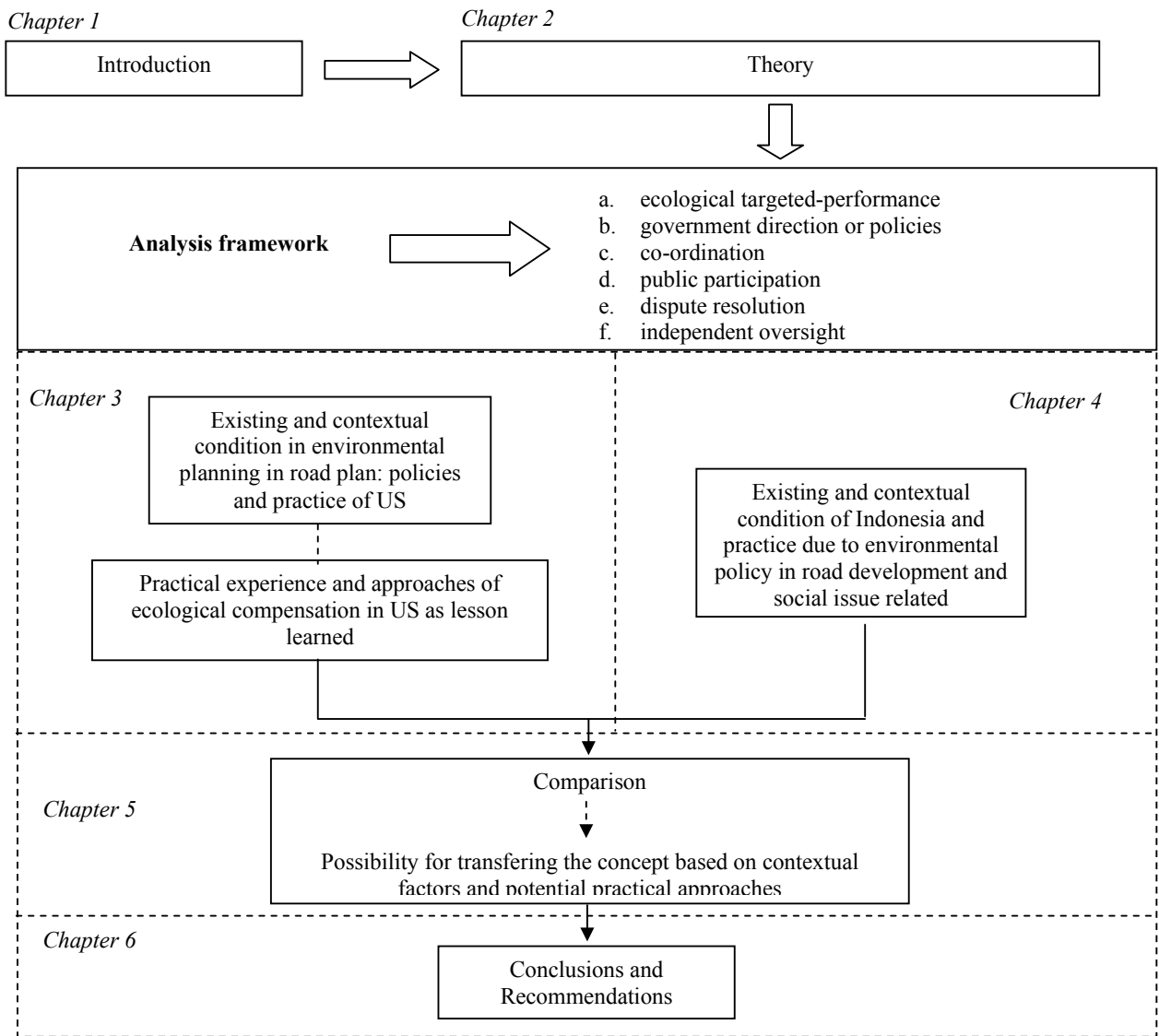
## **2. 6 Conclusion : Framework of Analysis**

Based on theories and general practical issues in ecological compensation explained in this chapter, the next chapter will be discussed about more detail the practical issue of ecological compensation in US. Moreover, the fourth chapter will discuss the existing condition in Indonesia due to environmental policy in road, and at the end of this chapter also will elaborate the limitation of the approaches to be implemented in Indonesia related to contextual policies and practices. The fifth chapter will analyse the possibility of ecological compensation implementation in Indonesia that will be assessed by comparing with existing condition of Indonesia and taking lesson learned from the experience of US.

The discussion of those chapters will be assessed based on **the six key components necessary for achieving sustainability** which are (a) ecological targeted-performance (environmental goals, site selection); (b) government direction or policies

(clear vision, goals and strategic direction); (c) co-ordination (among government agencies and among different interest groups in society); (d) public participation (in government planning and decision-making processes); (e) dispute resolution (mechanisms for preventing and resolving disputes); and (f) independent oversight (the capacity to independently assess progress achieved with implementation).

This thesis will be completed by conclusions and recommendations including the insight of the most appropriate ecological compensation strategy that should be implemented in Indonesia, and further actions regarding to opportunities and limitations in implementing of ecological compensation. The framework of analysis can be seen in figure 2. 3 as follow



**Figure 2. 3 Analysis framework**

## **CHAPTER 3**

### **ECOLOGICAL COMPENSATION IN THE US PRACTICE**

As stated in previous chapter, impact assessment is one of tools for achieving sustainability goals resulting for some alternative measures to reduce adverse impacts of human interventions such as road development. Ecological compensation is the last alternative chosen when impacts to environmental can not be avoided by prevention of mitigation efforts. However, ecological compensation in practice also deals with social value that has to be considered. There is important secondary impact from ecological compensation policy due to social structure that might be changed especially in affected area and affected groups such as low income people, minority population and ethnic tribe. This issue related to environmental justice in which there is uneven environmental management distribution received by particular community groups. The case ecological compensation in US is interesting to be discussed further. It is not only because of the long term experiences in the compensation, there also are some approaches applied in facilitating the implementation of ecological compensation that may become an alternative for accommodating social issues into account. This chapter will explain the experience ecological compensation in the US and policies related, and also will give a description about what important lesson can be taken from the experiences.

#### **3. 1 Sustainability target in US policy**

As stated in National Environmental Policy Act (1969), it has been recognized by the US government that there should be some efforts to maintain environmental quality for social welfare due to the environmental impacts resulted from human activities intervening natural environment such as population growth, high density urbanization, industrial expansion, resource exploitation, etc (NEPA 1969). Hence, the government make this regulation to direct all agencies to “use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfil the social, economic, and other requirements of present and future generations of Americans” (NEPA 1969). The statement related to sustainability goals spirit that ensures the using of resources for

present development will not reduce the ability of future generations to fulfil their needs.

Responding to sustainable development goals to be achieved in the future, the US government has established ten national goals towards sustainable development through The President's Council on Sustainable Development (PCSD) publication in 1996. PCSD was established by President Clinton in June 1993 to advise him on sustainable development and develop clear new approaches to achieve the economic, environmental, and equity goals. Formally established by Executive Order 12852, the PCSD was administered as a federal advisory committee under the Federal Advisory Committee Act (PCSD 1999).

There are some goals express the aspirations of the President's Council on Sustainable Development to seek economic prosperity, environmental protection, and social equity together (PCSD 1999). According to the President's Council (PCSD 1999), equity, conservation of nature, and civic engagement that has been stated as target elements in the development in US may become relevant goals with the highlighted issues in this thesis. *Equity* is related to give opportunity to all Americans in justice, and economic, environmental and social well-being achievement. *Conservation of nature goal* is relevant to efforts in ensuring natural resources benefits for long-term social, economic, and environmental for present generations and future generations. Meanwhile, *civic engagement* is another goal of US development to create full opportunity for citizens, businesses, and communities to participate in and influence the natural resource, environmental, and economic decisions that affect them. These goals become a basis for environmental management in US including how the state treats the citizen in environmental planning process. The sustainability goals are not only about environmental goals by stating conservation as nature goal, but also environmental justice goals by linking equity and civic engagement goal.

To support these goals, the government of US develops environmental policy related to maintain environmental quality for present generations and future generations. Through the Environmental Protection Agency (EPA), the US becomes a pioneer the use of a procedural analysis of environmental impact assessment because of human activities. Specifically, under NEPA, the government sets policy forward a national EIA process that applicable to all federal proposals having a significant impact on the environment quality (NEPA 1969). Trough several procedures, the EIA study is ended

by stating some alternatives means whether a particular plan need to be avoided or minimized including compensatory mitigation to reduce environmental impacts.

### **3.2 Ecological compensation-related policy in US**

In the beginning of ecological compensation practice discussion in US, this section explains about ecological compensation as an effort for wetland preservation other than directly to discuss the practice issues of compensation in road development. The objective is for give insights of how much ecological compensation policy in US is influenced by the existence of wetland condition. In the United States, the idea to raise compensation issue for nature land conversion was forced especially by the condition of wetlands due to intensification of destroying and degradation on wetland functions and values.

However, the information of ecological compensation practice on wetlands in US is still relevant to the focus of this thesis. It is because many wetland destructions and fragmentations are caused by concrete infrastructure such as road development, and many policies on wetland preservation also enforce other sectors policies such as transportation. The practice issues of ecological compensation in US's road development will be explained further in section 3. 4.

Through many research reports, it is indicated that there has been so much loosing of nature area especially for wetlands in US during the last decade caused by human interventions. By 1992, 45-50 % of wetlands in the 48 states had been converted to other uses, and loses approaching 90% in Illinois, Indiana, Iowa, Missouri and Ohio while urban development rose every year significantly.

Over time, there has been an increasing level of public awareness in US on the importance of nature area especially on wetland. In the past, it was lack of concern about the importance of wetlands and it was severe caused by several factors (OECD 1999):

- Unregulated authority between government institutions or policy makers, society, and privates in determining who hold the rights to convert wetlands and who are entitled to make compensation of loosing wetland to other purposes
- Less information and knowledge the relation among ecosystem elements and functions

- The economic value of nature area functions and services (e. g wetlands) was not well understood

Raising the public awareness of wetlands function as main resources providing clean water, it encouraged a movement to manage wetland for future generations. The government of US has seen the preservation of nature area especially wetland areas in most of US regions as important element due to ecological sustainability achievement (e.g. endangered and threatened species preservation and water quality enhancement) (Allen A. O. And J. J, Feddema. 1996). The fact that the US is still losing wetlands every year has initiated a movement toward ‘no net loss’ of nature area especially in wetland acreage as stated in Federal policy for the last eight years (OECD 1999).

### **- Shifting in environmental policies and regulations**

There have some shift in regulations and institution settings involved in enhancing and preserving nature area. It was only after the establishment of the Federal Water Pollution Control Act (FWPCA) in 1948 as one of the first congressional acts, the existence of wetlands as water resources was managed by specific government authority (Allen A. O. and J. J, Feddema. 1996). Afterwards, more government institutions in federal level are involved in environmental protection objectives such as the Army Corps of Engineers, Environmental Protection Agency (EPA), and the Natural Resources Conservation Services (OECD 1999).

Moreover, through several major policies and acts, the United States intends to recover, restore the functions of nature area through mitigation and compensation. The approach to United States of America’s wetland mitigation in the 1970s, is seen as the establishment of the concept of biodiversity and nature compensation (Burgin 2008). One of significant regulations enforcing government legislation in controlling of wetland conversion was the Clean Water Act in 1972. A principal objective of the Clean Water Act is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” (NRC, 2001).

Besides the Executive Order 11990 signed by President Carter in 1977 and US Fish and Wildlife Service mitigation policy that support the legislation for nature area restoration, according to OECD (1999), and Brown, P. H and C. L. Lant (1999), the Swampbuster program also has become another major policy that provides indirect incentive policy for nature area restoration and preservation especially in wetland

conversion to other purposes. The program encourages farmers to keep the land as original as possible. Thus, the farmers do not get most farm incentives such as price support loans, agricultural disaster payments, certain federally insured or guaranteed loans etc, if the farmers are willing to convert wetlands (OECD 1999).

From the explanations, it can be generalized that through some changes in regulations, there are wide acceptance by public of information and knowledge knowing ecosystem values and functions. Moreover, by establishing the definite form of institution such as The Army Corps of Engineers and supporting regulations such as Clean Water Act, there is an assurance on targeted goals and institutional settings in environmental management of US. There is a specific authority sharing between government institutions or policy makers, society, and privates in determining who hold the rights to convert wetlands and who are entitled to make compensation of losing wetland to other purposes.

#### **- Targeted objectives and the means in environmental management**

The 'no net loss' objective is a main targeted objective stated in Section 404 permit of Clean Water Act. To achieve that, the objective is supported by several alternative approaches (NRC, 2001). The proposed projects or programs that may cause impact on nature area especially wetland are first expected to **avoid** respectively harmful discharge of materials into wetlands and then to **minimize** harmful materials that cannot be avoided. When damages are unavoidable, the Corps of Engineers require the proposal of projects to provide "**compensatory mitigation**" to compensate remaining impact on wetland as a condition required in issuing a permit. Compensatory mitigation specifically refers to restoration, creation, enhancement, and in exceptional cases, preservation of other wetlands as compensation for impacts to natural wetlands to ensure that the 'no net loss policy' is achieved.

#### **- Institutional settings in US environmental management**

Besides definite targeted goals in environmental management, there are also institutional settings that have also directed responsibilities for each institution and level of government for preserving present and future generations' life. The definite institutions regulating environmental management especially on wetland was started through the section 404 of the 1972 Federal Water Pollution Control Act. The

amendment directs the Army Corps of Engineers and EPA to regulate whether what can be in or has to be excluded from water in US. The Section 404 permit files also regulate the wetland area lost per project, the type of wetland, the location of the affected wetland area, and the amount of required mitigation (Brown, P. H and C. L. Lant 1999). The Army Corps of Engineers became the federal agency responsible for the new permit program in which the Corps decides which activities would result in substantial and significant impacts to the nation's waters, including national wetland resources. Meanwhile EPA has the power to veto any Corps permit decision (USACE 1986 in Allen A. O. And J. J, Feddema. 1996).

Moreover, the Executive Order 11990 signed by President Carter in 1977 directed government agencies at federal level to minimize destruction, loss of degradation and to preserve and enhance the natural value of nature area especially for wetlands area. The direction is valid for all actions involving federal lands and activities effecting land use. In short, this order has become guidelines for federal agencies to avoid actions that contribute to wetland loss (OECD 1999). US Fish and Wildlife Service mitigation policy allows federal government to give recommendations and plan for mitigation measures in the early of permit process. The recommendation is given based on the policy outline for determining the levels of mitigation needed and the various methods for accomplishing mitigation. In general, this policy has goals and objectives to conserve, protect, and enhance wildlife and their habitat for continuing benefit for people. Thus, it may indicate that all the efforts in maintaining environment quality is not only ecological matters, but also has anthropocentric view.

Coordination has also been done between different institution sectors. Through US Fish and Wildlife Service mitigation policy, it has been stated that mitigation is not only belong to environmental institutions but also has linkage with other authorities. It is recommended for other institutions such as Department of Transportation to be involved in mitigation implementation on every project plan. There should be a cooperation and consultation between different agencies such as Department of Transportation and Department of the Interior in developing transportation plans and programs that include measures to maintain or enhance the nature area. It oblige to all the activities of the transportation department using protected lands to have approval or permit based on feasibility of the plans and alternatives proposed to minimize impacts to the environment by mitigation and compensation.



For monitoring mechanism, the government of US through EPA asked to the National Research Council (NRC) to form a committee that has responsibility to supervise mitigation (and compensation) actions. This committee called the Committee on Mitigating Wetland Losses is responsible to make evaluation on mitigation practice in restoring and maintaining the quality of nature land as regulated under Section 404 of the Clean Water Act (NRC, 2001). In more detail function, the committee evaluate both the ecological performance of mitigation projects and the institutions under which mitigation projects are conducted. In making report, the committee worked in a truly interdisciplinary and collaborative manner to develop the conclusions and recommendations.

### **3.3 Environmental justice in US environmental policy**

It has been realized by US government that there is also another value involved in environmental management instead of ecological consideration that has been reflected in US regulations and policies. Social value relating to ethic issues and its problems in environmental management also become important element that has to be identified and addressed. In US, these social issues that often have been termed as environmental justice issue are related to minority population or poor people that often get some disadvantages from environment condition such as environmental degradation. There is limitation of getting environmental service to take goods from natural resources and its very contrast to what people has to be deserved in their life. The condition may indicate that environmental degradation is not only experienced by people who caused that but also by people who get socio-economic disadvantages (Okereke, 2006).

Towards sustainability, the government of US already has stated environmental justice or ethic issue in some regulations related to environmental policy to be appraised by federal agencies. Through US Fish and Wildlife Service mitigation policy, it was initiated to involve minority population that has spiritual connection with environment in planning and decision making process. If one project or plan proposal is assessed as prominent factor for environmental degradation, Indian tribe has authority to involve in deciding the mitigation of the project or plan and the compensation for the impacts (Department of The Interior 1981).

Furthermore, Executive Order 12892 released by President Clinton has strengthen the policy to assess issues related to social value to be involved in politics and the

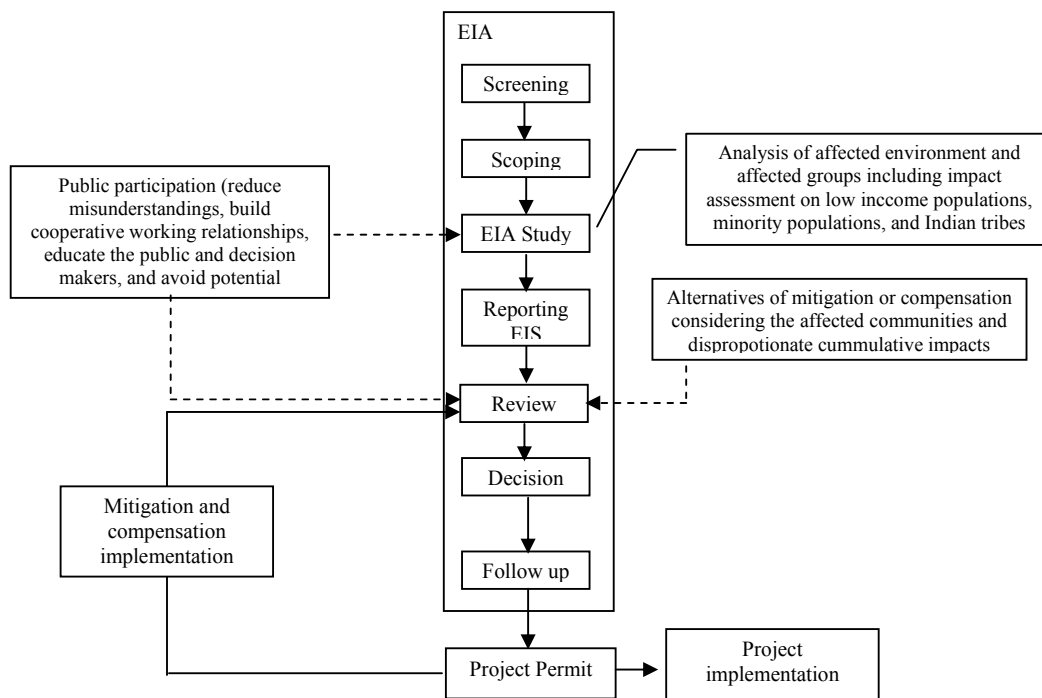
earlier of decision making process and became a part of impact assessment. Afterwards this order, federal agencies are directed to consider and mitigate adverse impact in social and economic on minority and low income populations (U.S. President, 1994 in Bourassa 2006). The direction is about efforts in avoiding and mitigating environmental injustices through participation. “If an agency identifies any potentially affected minority populations, low-income populations, or Indian tribes, the agency should develop a strategy for effective public involvement in the agency’s determination of the scope of the NEPA (National Environmental Policy Act) analysis” (CEQ 1997). As fundamental policy in environment management of US, through NEPA people are encouraged to live in harmony with their environment in productive and pleasant ways. The Congress “recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.” (CEQ 1997). The statement related to distributive equity in environmental justice issues has give values on human preferences to nature.

Furthermore, to consider environmental justice in NEPA analysis, Executive Order identifies four important ways (CEQ 1997):

- *Analyzing the environmental impacts* (health, economic, and social effects) of actions on minority populations, low-income populations and Indian tribes
- *Measuring mitigation alternatives* as a part or environmental impact assessment, also must
- Provide *public participation* in the NEPA process identifying potential effects and mitigation measures, and
- Provide *review scheme* of NEPA implementation

The analysis of the environmental impact should be identified on geographical scale to detect whether there is uneven adverse impact on minority populations, low-income populations and Indian tribes. Where a potential environmental justice issue has been identified by an agency, the agency should state clearly in the EIS. Consequently, the distribution of the uneven adverse impacts in these communities should be a factor in determining the preferable environmentally mitigation alternatives including compensatory mitigation measures. If those considerations are taken to impact assessment procedure in planning process, the possible scheme is shown in figure 3. 1

Referring to “Environmental justice guidance under the NEPA” (CEQ 1997), in broader considerations in impact assessment, the policy is not only legally binding to government agencies that has direct responsibility to maintain environment quality, but it also relevant to other authorities. It is been stated in the policy that many institutions such as Department of Housing and Urban Development, Department of Transportation, Department of the Interior, etc have been encouraged to be involved in giving recommendations of environmental justice to each plan proposed by joining in interagency Federal Working Group on Environmental Justice (“Working Group”). They have responsibilities in making more practical federal guidance in assessing the disproportionate impact distribution, coordination among agencies to ensure sufficient information hence any activity and policy in right manner, etc.



**Figure 3. 1 Environmental justice considerations within environmental impact assessment procedure** (interpreted by the author based on ‘Environmental justice guidance under the NEPA’ released by CEQ. 1997)

### 3. 4 Ecological compensation in US road development

Related to road development in US, compensatory mitigation has become one of main agenda for in highway project. Through Environmental Policy Statements issued by FWHA in 1990s, it stressed the importance of incorporating environmental stewardship into all agency activities. This included an emphasis on wetland protection

and enhancement and using a watershed approach in assessing impacts and developing mitigation strategies (Bank and Garret, 2001). To support the objective, it was established an agency policy (i. e FHWA) of *no-net-loss* goal for impacted wetland in 1990 and it was revised in 1996 to a *net gain* goal to reflect changing national goals for protecting and enhancing wetland resources on road projects especially on highway projects.

As stated in the 1998 Federal Highway Administration (FHWA) National Strategic Plan, there are two objectives should be achieved in every Federal highway project (FHWA, 2002):

- to protect and enhance the natural environment and communities affected by highway transportation
- to improve the quality of the natural environment by reducing highway-related pollution and by protecting and enhancing ecosystems

However these objectives have not concerned yet to social implications that may be emerged afterwards protection and enhancement ecosystem efforts are implemented. The target of environmental preservation efforts are mainly only about the achievement of acreage of nature area. The explanation below will give a description of the importance of nature area acreage achievement in US's ecological compensation for road development.

FHWA is committed to replace, on a Federal-aid program-wide basis, an average of 1.5 acres of wetland for every acre affected where impacts are unavoidable. As it is mandated in the Transportation Equity Act for the 21st Century (TEA-21), the Federal highway projects require compensatory mitigation under Section 404 of the Clean Water Act (CWA). During period 1996 - 2007, FHWA staff estimates that impacts to wetland in the Federal-aid highway program accounted for approximately 19,026 acres of wetland loss, and 52,167 acres of compensatory mitigation (CEQ, 2008). It means Federal-aid highway projects provided 2.7 acres (2.7:1 gain/loss ration) for area of compensatory wetland mitigation for each acre of impacted area. In other words the compensation area is twice more than the rate of wetland loss (see table 3. 1). These results demonstrate the continued strong commitment of the agency, Federal, State, and local resource agencies to protect and enhance the natural environment on every plan they made.

**Table 3. 1 Wetland net gain on the Federal-aid highway program (1996 – 2007)**

Fiscal Years 1996-2007 Total	Acres of Compensatory Wetland Mitigation	Acres of Wetland Impacts	Mitigation Ratio/Percent Increase	Acreage Gain
Total	52,167	19,026	2.74:1	33,141*
<i>*Gains from mitigation programs are not counted as acres toward the President's wetlands goal.            Note: FHWA discontinued its collection of nationwide data in 2005. This data is not representative            of migration in all 50 states.</i>				

Source : CEQ, 2008

As conclusion, those regulations and policies explained above gives some insights on the extent of compensation policy in US, the target and the institutional setting on it. Compensation policy has underlined the policy on nature area such as wetlands and other aquatic resources play that has an important role in the environmental landscape and the water resources. So that, those who intend to make some interventions causing environmental impact on the nature area of the US such as infrastructure construction commonly are required to follow the mitigation procedure. They must apply for a permit from the Corps approving by EPA under the Clean Water Act through “avoidance and minimization” requirements. Consistent with the wetland program’s goal of “no net loss of wetlands,” these permits often require compensatory mitigation particularly the restoration of former wetlands as mitigation means to compensate of unavoidable impact on wetland loss (The US EPA and the US Army Corps of Engineers. 2008). The focus in compensation wetland loss is still only on the achievement on the acreage of nature area in which social implications from compensation efforts has not been acknowledged yet.

In practice, compensatory mitigation offers different approaches that might be used in the implementation. In the next section, it will be discussed some different approaches as alternatives for the actualization of compensatory mitigation in US.

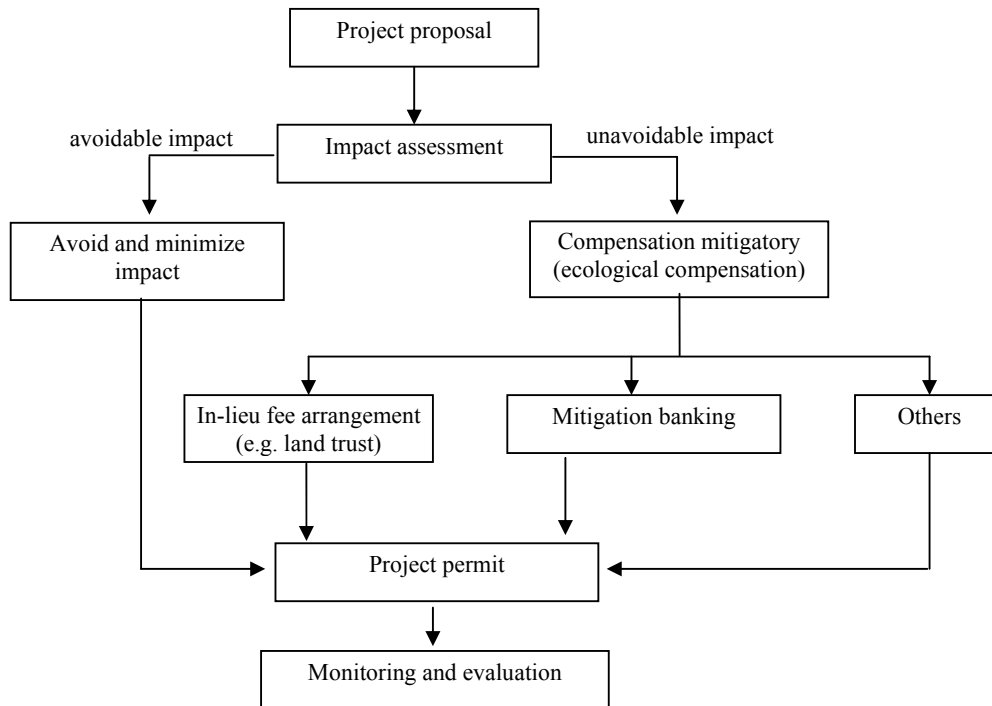
### **3. 5 Different approaches of US ecological compensation**

Basically, ecological compensation or compensatory mitigation can be accomplished through different approaches. Compensation that is completed by proponent or permittee is common happen in the practice. Moreover, compensation by a third party becomes other options that can be taken by proponent to accomplish their obligation to maintain environmental sustainability.

Third parties in compensatory mitigation have been developed to reduce limitations if the compensation is done by individual permittees. It can be generalized that a third party involvement in compensatory mitigation is relevant because several reasons, such as:

- The decreasing rate in acreage of wetlands in US and the increasing of public awareness on benefits of wetlands has encourage environmental agencies and other government institutions to developed other policies and strategies to reduce conversion and destruction of nature land especially wetlands because of concrete projects such as road development.
- Based on this study, larger mitigation projects are more successful than smaller projects. In addition, whenever possible, wetland mitigation projects should be coordinated to create large contiguous mitigation areas, rather than several small isolated wetland areas.
- Most planning situations, the activities converting wetland to other purposes are less involves the expertise on wetland mitigation. In addition, mitigation process has been seen as an expensive and time-consuming requirement that will cause over budget of the projects. Using a third party, like land trust or mitigation banker, can be a simpler alternative solution for more effectively mitigation process of loosing of wetlands caused by development projects (Brown, P. H. and C. L. Lant 1999). Furthermore, by involving environmental expertise joining in a third party organization, the 'no net loss' goal will be as a reachable target.

Compensatory mitigation in transportation is defined when there are impacts caused by road construction that are unavoidable. As alternatives in compensatory mitigation, it has been recognized two main approaches using different third party completing the requirements under mitigation policies: in-lieu fee arrangement represented in land trust and mitigation bank as the focus on this thesis. Figure 3.2 is a description of permit system under the US legislation including the alternatives in completing compensatory mitigation.



**Figure 3. 2 Permit system under the US regulations**  
(interpreted from Clean Water Act)

One of the third party approaches is “In-lieu-fee” mitigation. According to US EPA-Federal Guidance (2000), the approach occurs in circumstances where a permittee provides funds to in-lieu-fee sponsors such as *land trust* other than either completing project-specific mitigation or purchasing credits from a mitigation bank approved under the Banking Guidance”. In other words, the permittee is more prefer to support sponsors activities than investing the land or purchasing the land. According to ELI report (2006b), there are 42 active in-lieu-fee programs in US sponsored by private non-profit conservation organizations, state agencies, local government entities and public universities. In addition 25 of those active ILF programs (60%) are sponsored by private, non-profit conservation organizations (ELI, 2006b). Thus, non profit conservation organizations such as land trust become an integrated element of “in-lieu-fee” mitigation mechanism in completing ecological compensation in US.

Another approach is mitigation banking that becomes a planning tool that has regulated under federal Clean Water Act section 404 permit system. “The CWA Section 404 permit program relies on the use of compensatory mitigation to offset unavoidable damage to wetlands and other aquatic resources through, for example, the restoration or creation of wetlands” (Federal register, 1995). Project applicants are permitted to

compensate wetlands impacts only after they have taken efforts to avoid and minimize the impacts (Randolph 2004).

In the next sections, it will be elaborated in more detail about the alternative mechanisms in compensatory mitigation and those trends through the time that have been developed in US.

### **3. 5. 1 Permittee-reponsible mitigation**

In common practice, *permittee-reponsible mitigation* is one of mechanisms of compensatory mitigation according to Clean Water Act classification (NRC, 2001). Here, a permittee is legally responsible for completing compensatory mitigation as what had been stated in permit document. The permittee may use on-site or off-site location for compensation as soon as after permit is issued or concurrent with the project begins.

However, there are some limitations due to mitigation done by permit recipients. It is often limited control on permit recipients by authorized agencies to complete compensatory mitigation on the projects they have. Furthermore, legal and financial mechanisms for assuring long-term protection of sites are often lacking.

Hence, as recommended by National Research Council (NRC) (2001), the Corps of Engineers and other responsible regulatory authorities should establish and enforce clear compliance requirements for permittee- responsible compensation to assure that:

- Projects are initiated no later than concurrent with permitted activity,
- Projects are implemented and constructed according to determined design criteria and use an adaptive management approach that was specified stated in the permit,
- The performance standards are specified in the permit and attained before permit fulfilment is achieved
- The permittee provides a stewardship or funding organization that has authority to the compensatory wetland site by easement or purchase, and also provides a cash contribution appropriate for the long-term monitoring, management and maintenance of the site.

Due to limitations and uncertainty of the implementation of permittee-reponsible mitigation in financing and achieving no net loss goal, it has been developed other mechanism using a third party organizations. The organizations such as land trust or



private sponsors have responsibility to complete compensatory mitigation using funds given by permittees.

### **3. 5. 2 Land trust practice in US**

There are two most common types of land trusts: *conservation trusts* and *community land trusts* (Campbell and Salus. 2003). They are both of which use many of the same land-saving tools, but for different purposes as will be explained in this section.

- **Conservation land trust : the concept and trend**

Overusing of natural resources or expansion of land use conversion to industrial or settlement areas lead to the awareness to establish regulatory land-use planning system. Other than regulatory system conducted by government authority through zoning, taxation measurement, etc, there are still limitations of public land-use control measures. Public control has often been influenced by politics environment or limitation of financing. The condition has encouraged private citizen to be actively involved in land-use regulatory system. Where the performance of public sector has not been able to respond quickly enough (or at all), private land trusts provide a focused, long-term solution to land conservation and community preservation (Jacobs, 1999 in Campbell and Salus. 2003).

In the United States, protection to land as conservation areas is conducted by diverse actors: public, private and non profit organizations using different tools of management for variety of purposes. Federal, state, regional, and local governments, national and local land trust, private owners, etc are involved in land conservation in US (Randolph, 2004) as displayed in table 3. 2

Land protected by land trusts on the data shown include land that has different management tools such as land owned, protected by conservation easement, and purchased and transferred to public ownership. Most of the land is managed by national scale land trust such as The Nature Conservancy (12.3 million acres) followed by Conservation Fund (3 million), and the Trust for Public Land (1.3 million) while the rest of areas (6.2 million acres) are protected by more than 1,250 local and regional land trust (Randolph. 2004).

**Table 3.2 Land conservation by various parties in US (National scale)\***

<b>Land protected by</b>	<b>Total acres</b>	<b>% total area</b>
Federal government	402 million	20.6%
State government	85 million	4.3%
Local/regional government	25-50 million	1.3 - 2.6%
Land trusts	23 million	1.2%
Private land conservation	36 million	1.5%

Source : Hollis and Fulton (2002) in Randolph (2004:77)

(\* exclusive Alaska. Alaska is a special case that has different policy in land conservation

As explained in chapter 2.3.2, land trust is a non-profit organization created to preserve land for some public purpose. Land trusts can also be created by local open space and nature preservation associations (Silberstein, W. M and M, Beck. 2002). Under regulation the 1990 Memorandum of Agreement on mitigation between Environmental Protection Agency (EPA) and the Department of the Army, land trust approach as a part of in-lieu-fee mitigation arrangement may serve as an effective and useful approach to satisfy compensatory mitigation requirements and meet the goal of no overall net loss of wetlands as stated in the regulation (US EPA. 2000).

In line with the increasing of public awareness on serving both land conservation and development, the number of land trust in US also develops through the last few decades. Until 2000, the number of trust in US gain to the number of 1,263 with total protected areas 6.2 million acres (see table 3.3). Hence, in the last decade there is an increasing in number of trusts (42%) with approximately three times increased in acres of areas protected than ten years before.

**Table 3.3 Growth of local and regional land trust in US**

<b>Year</b>	<b>Number of Trusts</b>	<b>Acres Protected</b>
1950	53	NA
1965	130	NA
1985	479	NA
1990	887	1.9 million
2000	1263	6.2 million

Source : Land Trust Alliance (2003) in Randolph (2004:84)

The development of land trusts in the US has extended to cover all of 50 states, and the largest areas protected by land trusts is in Nevada followed by the protected

land in California, New Mexico, Florida, New York, and Arizona (see table 3. 4) (Hollis and Fulton 2002 in Randolph 2004).

**Table 3. 4 Leading states in land acreage protected by land trusts**

State	The Nature Conservancy	Conservation Fund	Trusts for Public Land	Local/regional Trusts	Total
Nevada	1,395,202	1,136,910	11,569	12,225	2,555,906
California	989,089	12,651	181,006	1,251,782	2,431,528
New Mexico	1,207,922	15,724	104,610	271,623	1,599,598
Florida	934,242	28,126	121,956	64,456	1,148,780
New York	356,045	158,976	56,016	56,016	1,123,257
Arizona	871,900	2,838	188,539	38,175	1,101,452

Source : Hollis and Fulton (2002) in Randolph (2004:85)

There some tools for land conversion used by government programs and land trusts. These include *purchase, conservation easement or development rights*, and other means of protection without complete purchase the land (Randolph. 2004). For nature conservation goals, a land trust can make some acquisition or purchase the land as one alternative in which the land will be developed as protected areas or restored area to compensate other disturbed land by human activities. The acquisition may use funds given to the organization by members and other donation organization. The trust may also borrow funds from banks or individuals for the acquisition, and agree to use future donations for repayment of the loan (Encyclopedia of the city, 2005). By using purchase as a toll for conservation land, the land will be fully owned and managed by land trust before and afterwards restoration.

Another alternative developing in land trusts is land conversion by easement approach (Randolph 2004) to protect public resources. With the easement approach, the landowner retains title to the land but gives an interest or a commitment in the land to the trust. The trust's interest typically involves a condition on the property's title that includes some development restrictions in using land in which has to be prevented from specific development on the land or maintained the current use of the land (Encyclopedia of the city, 2005). The restrictions are determined *based on agreement between landowner and easement receiver* (government or land trusts) considering to landowner's needs and an analysis of the property (Randolph. 2004) for the purpose of preserving certain values of the property (wildlife habitat, forests, open space, agricultural lands, scenic view, or historic structures) (Silberstein, W. M and M, Beck.

2002). In simpler words, there is *no a transfer of property ownership in this approach*. According to the American Farmland Trusts (Randolph 2004), 21 states and 34 localities in 11 states use easement approach in protecting 1 million acres of farmland.

It has been stated in some literatures (Randolph 2004, Encyclopedia of the city, 2005) that conservation easement has several advantages if it is compared to other regulatory mechanism such as zoning or acquisition of land:

- The approach needs less costly than fully acquisition. It is beneficial for most of land trusts organization due to limitation of financial capability to protect large scale of land through fee-simple purchase;
- Conservation of the land is achievable without responsibility to maintain the property. It is because even though the land has permanent status as protected land for current owner and also for the next owner, the ownership of land is still on private hand (private landowner) so land trust can reduce management cost;
- Conservation easement offers potential income or compensation and tax benefits from donation or payment; and
- Tailored to the protection requirements of the existing landowner and the property, and the desire of the landowner, and this is become one factors easement approach make conservation efforts are much easier that acquisition of the land.

Hence, many private organizations, primarily land trusts, have developed the conservation easement to preserve land (Silberstein, W. M and M, Beck. 2002)

However, the limitation of financial capability has insisted land trust organizations to generate more revenues, donations or loans to make some land acquisitions for conserved land and to subsidise housing provision so the price can be maintained under market price. In table 3.4, there are some advantages and disadvantages of approaches in land trust.

**Table 3.5 Advantages and disadvantages of conservation land trust**

Land trust approach	Advantages	Disadvantages
<p><b>Conservation land trust</b></p> <ul style="list-style-type: none"> <li>- Acquisition/simple purchase</li>   <li>- Easement/development rights</li> </ul>	<ul style="list-style-type: none"> <li>- Gives trusts full control</li>   <li>- Provides full access to the property</li> <li>- Guarantees permanent protection</li>   <li>- Less expensive than purchase</li>   <li>- Tailored to the protection requirements of the landowner and the property, and the desire of the landowner</li>   <li>- Landowner retains ownership and property remains on the tax rolls, often at a lower rate because of restricted use</li> <li>- Potential income and estate tax benefits from donation</li> <li>- More permanent and often more restrictive than land use regulations</li> </ul>	<ul style="list-style-type: none"> <li>- Expensive, so it needs financing supply from donation or loan from sponsor (e.g bank, world foundations)</li> <li>- Usually removes land from tax base</li> <li>- Ownership responsibility includes liability and maintenance</li>   <li>- Public access may not be provided</li>   <li>- Easement must be enforced</li> <li>- Restricted use may lower resale value</li> </ul>

*Source : Randolph (2004:88)*

• **Community land trust and its relation to ecological compensation**

The issue in ecological compensation may be related to social issue due to resettlement action in the implementation and the community involvement in land management. It should be considered that ecological compensation may relate to resettlement of affected communities to another place that may need new houses. On the other hand, local community involvement may be important in land management as compensation area. So that, social interest to have economic income or to maintain social value on their land can be accommodated in the efforts for environmental preservation.

The issues related to Community Land Trust (CLT) may give another perspective in ecological compensation in practice. The concept of CLT may be an alternative accommodating social interest of affected communities needs on affordable housing due to implementation of ecological compensation. Other than that, CLT may encourage more communities involvement in managing their own land and property that may be a good approach not only for housing issue but also for nature preservation issue.

In CLT, the trusts may purchase land and existing housing, and make some improvements for new housing. The houses built will be offered to be rented or be owned by the occupants who have low income with lower price than market (Bourassa, 2006). To keep housing price affordable, the trusts develop two strategies. The first is on *ownership strategy*. Afterwards the trust builds a new house and then sells it, the trust retains title to the land and the owner has title to the home. So this arrangement gives the homeowner an opportunity to build limited equity through the home purchase, while the trust controls escalating costs from land speculation (Bassett, 2005). The second strategy is on *price mechanism*. The occupants have limitations to get property gains from re-sale and rent costs. So by “decommodifying” housing and by limiting of property gains, the price will be kept on a low price for next buyers (Bourassa, 2006).

Connecting to environmental justice issues that have potential to emerge because of resettlement on road projects, through those two strategies, CLT is apparently a solution to the environmental justice problem that the highway will create (Bourassa, 2006). By sharing the obligations of land ownership, and the control on housing price, it seems that the model could provide a social safety net as a supporting element to maintain the access of poor communities to their land (Bassett, E. M. 2005). The strategies offered by CLT are tools for maintaining affordability of affected groups in perpetuity or, at least, for as long as possible in redeveloping neighbourhood.

CLT also offers a particular institutional arrangement accommodating public, private, and affected group members' interests. David (1994) in Bourassa (2006) argues that this arrangement is a reflection of a combination private and public sector approach in affordable housing provision by combining private ownership of land and housing with techniques for maintaining affordability which is managed by public sector. Moreover, community members have an important role in managing CLT by joining on CLT committee as representatives that has responsibility in maintaining equal access on affordable housing.

### **3. 5.3 Mitigation banking practice in US**

Compensation needs a lot of money and takes quite long time due to difficulties on looking for land as compensation area and enhancing ecological values in a created nature site (Cuperus, personal communication). Moreover, individual actions in compensatory mitigation often results in scattered compensation area and lower

qualified habitat compared to natural system without the assurance of long term management.

Mitigation banking provides another mechanism for completing the mitigation. The program may offer a guarantee that compensatory mitigation will work. It is because mitigation banking mechanism requires that the restoration project has been completed before permitting issued, so there is more certainty in achieving mitigation goals. Without banking, permits were issued based on mitigation plans that are proposed by landowner or private developers. However there are some uncertainties remains whether the plans or the restoration will be completed (Randolph, 2004). Hence, the existence of mitigation banking may reduce the uncertainties.

In general, mitigation banking is an instrument of financial incentives policy that has been developed for the purpose of providing compensatory mitigation for adverse environmental impacts that can not be avoided or prevented under section 404 regulatory program (Zinn 1997 in Randolph 2004). In another definition, mitigation banking means “habitat protection or improvement taken expressly for the purpose of compensating for unavoidable losses from specific future development actions” (Department of Interior. 1981). It is additional tool for particular cases that has potential to have adversely impact to the environment excluded from other measures like tools to avoid, or minimise environmental damage (ten Kate et al. 2004 in Burgin 2008).

As stated in Federal Guidance document of EPA (Federal Register. 1995), mitigation banking approach offer greater flexibility in completing mitigation requirements added with several advantages as follows :

- Establishment of a mitigation bank can bring together financial resources, planning and scientific expertise;
- Use of mitigation banks may reduce permit processing times and provide more cost-effective compensatory mitigation opportunities for projects that qualify;
- The compensatory mitigation is common implemented and functioning in advance of project impacts that reduce nature habitat losses and uncertainty on the successful compensatory mitigation projects.
- Consolidation of compensatory mitigation within a mitigation bank increases the efficiency in the review and monitoring of mitigation projects, and thus improves

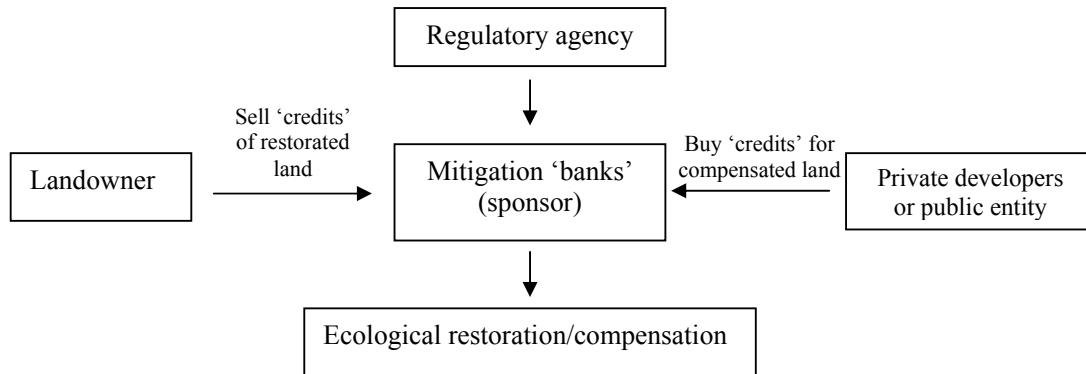
the reliability of efforts to restore, create or enhance nature area (e.g. wetlands) for mitigation purposes, and

- The existence of mitigation banks can contribute to the achievement of the goal for no overall net loss of the Nation's wetlands by providing opportunities to compensate in advance impacts when 'avoid and minimize impacts' mitigation efforts might not be practicable to be done.

In its practice in the field, market-based approach is involved in this compensatory mitigation approach. Environment is assessed by certainty amount of economic value ('credit'). There is 'sellers' and 'buyers' mechanism in which landowner or any groups who restore wetlands become sellers by offering 'credit' of their land to bank. Landowners may create 'biodiversity credits' as the 'cost' as that has to be compensated of what they had done to enhance and protect biodiversity values on their land, and. Private developer or public who has project proposal that has potential to make changes on nature habitat or threat on endangered species can buy 'credits' from conservation bank owner. These credits are bought to compensate impacts that potential to be emerged and cause a decline on biodiversity values due to development (Burgin 2008). The banker would continue to conserve the compensated land with appropriate assurances (Marsh et. al.1996 in Brown, P. H. and C. L. Lant 1999 ). A description of this approach can be seen on figure 3.1.

However, these advantages imply the simpler way could be taken by proponents for accomplishing their obligation to restore the environment condition. The long term management in ensuring the achievement of ecological values is still other issues that should be concerned. There is a possibility to make oversimplification of environmental destruction that proponents made because of simple way to compensate it.



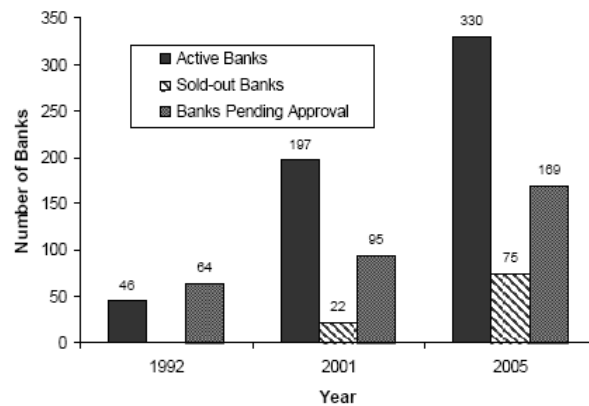


**Figure 3.3 Market based approach in mitigation banking**

Nevertheless, during the last decade (1992-2005), there is an increasing in number of mitigation banks in the US. Based on Environmental Law Institute (ELI) 2005 report, in 2001, ELI documented 219 approved mitigation banks in the country. Of these, 197 were active and 22 were sold-out<sup>6</sup> (see Figure 3.4). The total number of approved banks represented a 376 percent increase over the number of banks identified in 1992. At the time, there were also 95 banks pending approval by the Corps<sup>7</sup>. In our most recent survey, the Corps districts reported that, as of September 2005, there were 405 approved mitigation banks in the country. Of these approved banks, 330 are currently active and 75 are sold-out. Through this trend, it can be indicated that mitigation banking mechanism has been chosen as a promising third party involvement in completing compensatory mitigation of projects plan.

<sup>6</sup> A sold-out bank is one that has been approved and for which all of the available credits have been sold (i.e., the bank has been completely debited) (ELI, 2006)

<sup>7</sup> A pending bank is one with a completed draft banking instrument or prospectus, but for which the Corps has not yet approved the banking instrument (ELI, 2006).



**Figure 3. 4 Mitigation Banking Trends: The number of mitigation banks in the United States that were active, sold-out, or pending approval in 1992, 2001, and 2005 (Source : ELI, 2006a)**

### **3. 5. 4 The potential and limitation of ecological compensation approaches in reconciling ecological and social conflicting interests**

It has been stated in US environmental policies that environmental justice principles should inherent in every project permitted. Through those third party compensatory mitigation strategies, it is expected that sustainability in ecological and social will be achieved. The advantages provided by two different approaches may give some insights how social values can be concerned in the implementation of ecological compensation while there are still some weaknesses to be responded for further implementation.

In most cases of planning, environment issue has common to have conflicts with other two interests, social and economic. Through mitigation banking, ecological elements are monetarily rewarded by certain of ‘credit’ that make mitigation efforts are easier to take into economic valuation (e. g. benefit cost analysis). Moreover, mitigation banking and land trust as well create geographic flexibility in mitigating for wetland conversions so that developers can find cost-effective solutions, while maintaining a polluters-pay principle (Brown, P. H. and C. L. Lant 1999). So developers can fulfil their interest in gaining economic balance while they also participate in maintaining environment quality.

The different interest between social and environmental protection efforts may be reconciled through these both strategies: land trust and mitigation banking. The ‘credit’ as indicator for economic value of nature land is determined by an agreement between landowner who has restored the land and committed the land as protected area, bank sponsor who will complete compensatory mitigation process, and government as controller based on market price. This process is a reflection of *consensus and participative process that may reduce conflict*. It is believed by economist that market price is a reflection of consumer’s utility in a commodity or resources. Mitigation banking will produce resources in ‘socially optimal’ and at the lowest cost (Robertson, 2008) because it may create desirable ‘credit’ for proponents and landowners. Moreover, in land trust organization, individual owner of the land or housing may involve as member of trusts who participate in decision making process and land management. For example, individuals who rent housing managed by CLT are engaged to landuse, acquisition and financial management (Institute for Community Economics, 1984 in Bassett, 2005). Through participation, it is potential to be a key in reconciling conflicting interests between government, private, and local communities.

The new standards of EPA and the Corps mitigation rules (2008) also expand and strengthen *public participation* in decisions regarding resource restoration and protection efforts. It is required more information in public concerns describing how impacts will be avoided, minimized and compensated for. Furthermore, all proposed mitigation banks and in-lieu fee programs (land trust) will receive public notice and comment. These new standards will improve accountability for replacement projects conducted by the regulated community by encouraging “performance-based” forms of wetland replacement (The US EPA and the US Army Corps of Engineers. 2008).

Furthermore, the process of compensatory mitigation involves *coordination* between government agencies and other related organizations in compensatory mitigation to ensure the mitigation implementation in transparent and effectual. Section 404 permit system is a base regulation for guiding compensatory mitigation for all government agencies that is not only give direction for agency that has responsibility in maintaining environmental quality, but also for other agencies such as Department of Transportation, Department of Law, etc. Moreover, some government agencies also involve in determining instrument of compensatory mitigation. The Corps of Engineers, other Federal agencies, and several natural resource management organizations (e. g.

land trusts) make formal arrangements to ensure there are sufficient options to be effectively replace lost functions and values (U.S EPA. 2000). The state and local resource planning agencies, the bank sponsor, and federal agencies that has established in Mitigation Banking Review Team (MBRT) also have prominent function in the negotiation for determination of mitigation banking instrument (Brown, P. H. and C. L. Lant 1999).

However, the concept of land trust or mitigation banking has limitations. Market-based approach in mitigation banking might be appropriate approach in valuing the environment or ecological elements by determining ‘credits’, but it may also extend to worsening environmental degradation. Through ‘polluter pay principle, private developers may feel to have more ‘rights’ to use more resources after they give their responsibilities to compensate to land trusts or mitigation bankers. Moreover, ‘credit’ to compensate is only given to people who own the land. Meanwhile if the land has been changed to protected area as compensated land by landowner, it also affects to other people who usually use the land e. g. temporal farmers (poorer community) or landowner it self who may loose their job or income. This may lead to environmental and social injustice.

It can be generalized that the implementation of ecological compensation should not only in efforts to enhance ecological value or maintain the nature acreage nature area, but also in a way to consider the impacts on affected communities (social impacts). The existing mechanisms tend only to accommodate proponents interest to get permit of their projects and landowner interests to have ‘credit’ to sell. However, the other mechanisms to accommodate other affected groups (i. e people who have less access on land) in ecological compensation practice are not clear yet.

Another limitation is due to institutions of the organizations (Brown, P. H. and C. L. Lant 1999). For example, under current practice, financial assurances are only guaranteed through the construction phase with a standard 5- to 10-year monitoring period. Meanwhile, the spatial relocation of nature area period or time required for constructed wetlands to replicate the functions of the converted wetlands take longer time. This financial limitation may result in at least a temporary loss recovery. Hence, more donation or financial sponsors are needed indeed.

Challenge in institutional setting issue in environmental protection institutions also related to possibility of overlapping responsibilities between different levels of government (The Conservation Foundation. 1990). There may compete in interests among different politic power levels that have implication on permit process especially on determining compensation location. Particular state may hesitate to provide compensation area to replace environmental damage on different states that associates to NIMBY issue.

Just like in other cases, the implementation of compensatory mitigation in US is faced to socio economic impact problem caused by mitigation policy. Little attention has been given to which socioeconomic groups might be affected by such relocation even though Executive Order 12898 establishes environmental justice considerations as a priority in federal decision making (BenDor, Brozovic, and Pallathucheril. 2007). The regulations that much more emphasize on the rate of nature area acreage leave the Army Corps of Engineers (ACOE) and EPA without basis for pursuing socioeconomic distributive justice. Moreover, according to BenDor, Brozovic, and Pallathucheril (2007) a recent ACOE environmental assessment (ACOE, 2006 in BenDor, Brozovic, and Pallathucheril. 2007) concluded that “new mitigation regulations (ACOE & EPA, 2006 in BenDor, Brozovic, and Pallathucheril. 2007) will have no effect on environmental or social justice although the regulations clearly support mitigation banking”. Hence, the experiences and challenges of compensatory mitigation in US give some insights that size of nature area is not enough to guarantee the achievement of social sustainability. There may be some considerations to be concerned for further implementation of ecological compensation in another place.

In conclusion, besides the strengths and weaknesses of compensatory mitigation practice in US, the third party mitigation still offer more advantages than permittee-responsible mitigation (mitigation done by project owner). In the 2001 study, the National Research Council stated that “third-party compensation approaches (mitigation banks, in-lieu fee programs) offer some advantages over permittee-responsible mitigation” because as Government Accountability Office (GAO) concluded that those approaches provide more *oversight* for mitigation performance (ELI, 2006a). It should be noted that the challenges for further implementation how these third party approaches may become a promising tool towards socially and environmentally sustainable in ecological compensation practice. Some improvements related to

institution settings may be needed in which not only to consider on nature area acreage achievement, but also on creating opportunities for affected people's life.

The case in Madison, Wisconsin can be taken as an example of an innovation in third party institutional setting. Conservation and community land trust used to be as separated organization, make collaboration in managing the Troy Gardens project. The collaboration between the Madison Area Community Land Trust (MACLT), a community land trust, and the Urban Open Space Foundation (UOSF), a conservation land trust has preserved a 31-acre site in a city neighbourhood for a combination of open space and affordable housing (Campbell and Salus, 2003). This idea perhaps can be give a description on the importance of institutional setting for better environmental performance without causing disproportionate certain social groups.

### **3. 6 Concluding remarks**

The issues related to environmental quality has become primarily agenda in US regulations in a way towards sustainable development. It was started when there were significant risks of loosing wetlands and water resources if there were no mitigation efforts to reduce the decline. The Government of US issued some major policies and acts as enforced guidelines to recover, restore the functions of nature area through mitigation and compensation (table 3. 6).

Ecological compensation or compensatory mitigation is the last alternative clearly stated in Section 404 permit of Clean Water Act to be taken if the damages caused by project can not be avoided. The 'no net loss' becomes main objective or target to be achieved in US environmental management that has been sated under Section 404 permit of Clean Water Act though avoiding, minimizing, and compensating nature loss.

**Table 3. 6 The US major policies and regulations supporting ecological compensation performance**

<b>Year</b>	<b>Explanation</b>
1948	Federal Water Pollution Control Act (FWPCA)
1969	National Environmental Protection Act (NEPA)
1972	Clean Water Act (Section 404 permit)
1977	Executive Order 11990 by President Carter
1981	US Fish and Wildlife Service mitigation policy
1995	Federal Guidance for The Establishment, Use, and Operation of Mitigation Banks
2000	Federal Guidance on the Use of “In Lieu-fee” Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act

Environmental justice and social issue stated in the US policies as a part of assessment process of project proposed and a part of decision making consideration, may be additional perspective in further ecological compensation actions. If it is identified any potentially affected minority populations, low-income populations, or Indian tribes, participation becomes an alternative to avoid and mitigate environmental injustice to those groups. By referring to the regulation, it is expected that the right of each person to have better quality of environment and better social life can be fulfilled, and people can live in harmony with the environment by actively preserving and enhancing the quality of environment.

It has been developed some strategies to accomplish ecological compensation toward environmentally and socially sustainability. The strategies are not only simply zoning or restrictions, but also consider to property rights. Under regulation of Clean Water Act, it has been developed some approaches in which two of those area in-lieu fee arrangement represented in land trust organization and mitigation banking (table 3. 7).

Through these policies and regulations, it can be indicated that the US government has committed to make environmental management especially in using compensatory mitigation is essential towards ‘no net loss’ and sustainable development goals, as it is reflected in explanation table 3.8

**Table 3. 7 Compensatory Mitigation Mechanisms**

	<b>In-lieu fee arrangement (i. e Land Trust)</b>	<b>Mitigation banking</b>
Location for compensatory mitigation	Off – site	Off – site
Compensation	In kind mainly aiming in preservation of land area	In kind and off kind compensation is possible, depend on the case aiming in restoration lands (wetlands) and water resources
Responsible party	Fee administrator, typically conservation organizations or government agencies that have entered into a formal MOA with the Corps and collect cash payments for initiating mitigation actions	Sponsor, typically a private firm that provides capital for project initiation. Recovers cost and earns a market rate of return by selling mitigation credits to permittees
Approach	Using donation or funds to purchase the land to be resorted as compensation area. Easement approach become another alternative used by land trust	Using ‘credit’ for valuing compensated area, and then to be sold to permittees
Relationship between permitting and compensating activities	Permitted activity cannot be started until a fee has been paid to the fund administrator. Compensation actions are taken after adequate funds are collected	Permitted activity cannot commence unless there are credits available for sale to the permit recipient. Limited early sales of credits may be possible

*Source : National Research Council (NRC). 2001, the US EPA. 2000, and others*

From the explanation of the compensatory mitigation experiences in US, it gives contribution as considerations to be taken as input for the implementation in Indonesia. However, the government of US has still challenges in implementing ecological compensation to be more sustainable, especially in establishing environmental justice considerations associating with socio economic impacts affected by the mitigation policy.



**Table 3. 8 Lesson learned based on US experiences**

Indicators	Key points	Explanations
<ul style="list-style-type: none"> <li>• Content</li> </ul>	a. Ecological performance target	<p>‘No net loss’ becomes main objective in environmental management that underline compensatory mitigation in practice. At least the ration between new nature area and compensated area is 1.5 : 1. Moreover, compensatory mitigation is completed in the way as follows:</p> <ul style="list-style-type: none"> <li>- on-site compensation as priority</li> <li>- off-site compensation site also may be chosen as another alternative that implies geographical flexibility that consider to ecological value achievement as the origin area</li> <li>- make compensated or restored area in integrated ecosystem system by completing compensation into larger scale of restoration than small scale or scattered.</li> </ul>
<ul style="list-style-type: none"> <li>• Process</li> </ul>	b. Government regulations	<p>There are clear and integrated policies or regulations in managing all human activities in responding environmental issues or impacts. Environmental management efforts are supported not only by expertises but also by politician and legislative that make the efforts has stronger position to be enforced binding all institutions.</p>
	c. Coordination	<p>Environmental management is not only environmental agencies matters, other agencies also have responsibility to actualizes activities for better environmental quality. The involvement non governmental sponsor through bank or non profit organization in compensatory mitigation raises the importance of coordination between government and private parties. Proponents are also involved in coordination with regulators (government) to determine the type of strategy chosen for compensatory mitigation.</p>
	d. Public participation	<p>Public participation such as Indian tribes members involvement has been started since the early of decision making process in permitting and proposing mitigation project or plan. Participation becomes essential element in impact assessment procedure, so that potential conflict can be anticipated and reduced. Participation also related to directly community involvement in managing their land and property.</p>
	e. Dispute resolution	<p>Participation actions to reduce environmental and social conflict, the intensive use of third parties such as land trust or mitigation banker reduces conflict of interests between different parties, for example between road investor and environmentalist trough mutual agreement formed together. Moreover, through freedom of information act, the role of the courts, and legislative oversight may reduce potential conflict between different government institutions (federal-state) interests.</p>
	f. Independent oversight	<p>Government-formed institution, legislative, and community take a role in mitigation evaluation mechanism. Committee on Mitigating Wetland Losses is one of institution examples for evaluating the practice.</p> <p>The rights of affected groups such as Indian tribes to issue the claim on responding disadvantages from environmental degradation lead to community empowerment and independent supervision on environmental quality. Moreover, the character of land trusts as non profit organization or mitigation bankers that mostly as independent entrepreneurs reduces the potential of misinformation about environment quality. The third parties are not structural binding to politic interests and bureaucracy.</p>

Here the challenges that may be founded in the process for achieving environmental and social sustainability in ecological compensation based on US experiences:

- There is possibility to have a negative implication from ‘geographical flexibility’ that tends to find off-site in choosing compensation site. Without proper considerations in selecting compensation site may lead to social conflict (i. e landowner and authorized agency) and failure of compensatory mitigation in reaching no net loss goal and social justice.
- It is indicated that there is less legal and institutional instrument to accommodate social or justice considerations in to environmental decision making process. The no net loss goal that mainly consider only to the acreage of nature area achievement is not enough to pursue socio economic distributive justice.

Hence, it may be needed to make some improvements in regulations and institutional settings of ecological compensation concept covering decision making process and implementation as well. So, it is more give opportunities for achieving ecological goals and justice in environmental and socio- economic as well, for example by making collaboration on institutional arrangement of third party approaches in compensatory mitigation to support each other.

Related to next chapter, the discussion about the practice in US gave some insights of how ecological compensation has been implemented there. Those facts may give different perspectives as considerations for further implementation in Indonesia that has different contextual condition. The next chapter will discuss contextual condition in Indonesia and its relation to ecological compensation concept for acknowledging the possibilities and limitations in the plan to insert ecological compensation into Indonesia’s policies.

## **CHAPTER 4**

### **CURRENT SITUATION IN INDONESIA**

The differences context between developed country such as US and developing country such as Indonesia gives different perspectives on how ecological compensation may be implemented. This chapter provides a brief explanation about Indonesia related to the development of environmental planning due to road plan, and current condition related to ecological compensation concept. Even though ecological compensation has not been implemented in comprehensive, there are some indications towards the implementation of ecological compensation as the focus of this chapter. Through this chapter it also will be discussed some issues related to ecological compensation if the Government of Indonesia intend to implement the concept. The issues are related to six elements: ecological performance target, government regulation, coordination, public participation, dispute resolution, and independent oversight.

#### **4.1 Environmental planning related to road plan toward sustainability in Indonesia**

Different condition and background have influenced the government of Indonesia in taking environmental issue into account of its policies. The strong development-oriented on economic growth has influenced the awareness of public on environmental problems. It is believed that economic level of particular society will be significantly enhanced if there is supporting road network for their activities (Dardak 2005). Physical infrastructure especially road network shaping national sphere structure has strong association with economic growth of an area and social culture life. Until 2002 the length of road facilities in Indonesia including national road, local road, and highway has reached 310.610,62 km (Public Works, 2002) connecting one area to others for accelerating local, regional and national economic growth, and social welfare.

However, the former development orientation that too much emphasize on high economic growth gave less equal implication on benefit distribution and income for different regions and for different groups. The condition leads to the implication on overuse of natural resources by communities or private parties especially on disadvantage regions or people that cause negative impacts to environment, social, and economic (Amron, 2007). The disturbance on those three basic elements of life will

threat the sustainability of human life. Hence, to guarantee human life of present and future generations in such a good environmental quality, it is important for the government to concern on environmental management in order to preserve environment function, and to control environmental degradation and pollution.

The condition generates the Government of Indonesia to change the strategy of development. The Government tries to consider more on environment protection other than only on economic growth by formulating efforts to reduce impact to environment because of road development and other physical activities. Spatial planning and environmental planning becomes an integrated part of road planning. It means that every road construction plan has to fulfil the requirements stated on some regulations due to carrying capacity and environmental protection from adverse impacts.

All activities on land including road construction has been viewed in spatial planning as an intervention on the landscape that has to be concerned in efforts to keep nature in balance and sustainable development. The National Spatial Planning enacted by Act number 26/2007 encompasses plans on making use of sphere, utilization of sphere, and controlling the use of the sphere aiming at :

- Achieving harmonization between nature environment and man-made environment
- Achieving integration between the utilization of natural resources and man-made resources by considering human resources
- Protecting sphere's function and preventing negative impacts to the environment caused by sphere utilization.

Road planning has also been managed by environmental planning through the Act no 23/1997 about Environmental Management Act (EMA). All project plans has regulated in the Act as an integral part of efforts to achieve sustainable development. In general the targets of environmental management in Indonesia according to this enactment are:

- (1) To guarantee the fulfilment of environmental service for present generations and future ones,
- (2) To achieve the environment functions preservation, to control the utilization of natural resources
- (3) To achieve harmony and balance between human interest and environment's ones.

In a way to achieve those, the Act develops two instruments: a pre-emptive and preventive instrument to reduce environmental degradation caused by human activities (EMA 1997). *Pre-emptive* instruments comprise efforts conducted at decision-making and planning level, such land use plan and project EIAs. Meanwhile, *preventive instruments* are efforts conducted at the production or source level of environmental impacts through applying environmental standard such as ISO 14000. Furthermore, the enactment provides administratively management to reconcile the environmental dispute that common be emerged in society between different interests (i. e private vs public interest) by using different approaches, court and out of court mechanism, to get an agreement constructed among disputed groups.

Indonesian Environmental Impact Assessment (EIA) or AMDAL is one of pre-emptive instruments that has been highlighted in the EMA as a prominent requirement for measuring the properness of the plan proposed to be implemented and for licensing or permitting process of any project plan. According to Hardjasoemantri (1994), EIA is a tool for decision makers to consider the consequences that may arise from a human activity to the environment, and then decision makers can prepare some measures to cope with the negative impacts arose and to enhance the positive impacts. To get permit or license, every project plan which is considered likely to have significant and substantial impacts to the environment (natural, man-made or social culture environment) must be follow environmental impact assessment procedure. Considering to significant impacts to environment caused by road development, thus, road planning can not be separated from national environmental management policies.

Moreover, the detail explanation of Environmental Impact Assessment (EIA) procedure in Indonesia is articulated in the Government Regulation No. 27/1999 (figure 3. 5). In general according to the regulation, the EIA procedure has two objectives: to anticipate negative impacts in the early of project plan and to develop more positive impacts. To achieve the objectives, the EIA study encompasses some scientific and social assessment such as, ecology social-economic, social-culture, and others.

There is a particular committee who has responsibility to manage environment and assess the reliability of project plan. Thus, EIA procedure is appraised by this committee consisting different government institution, affected community, social organization, expertises in environmental science, etc. In the process to get license or permit to complete the project, the committee see a project plan from three points:

- Spatial planning

A project plan will be rejected to get permit if the project has a plan to use a forbidden area (e. g. conservation area) or use an area that against national or local spatial planning.

- Public opinion

Every decision will be made as an output of EIA must be considered to suggestion, opinion, and response given by society

- Judgement and recommendation from related government institution

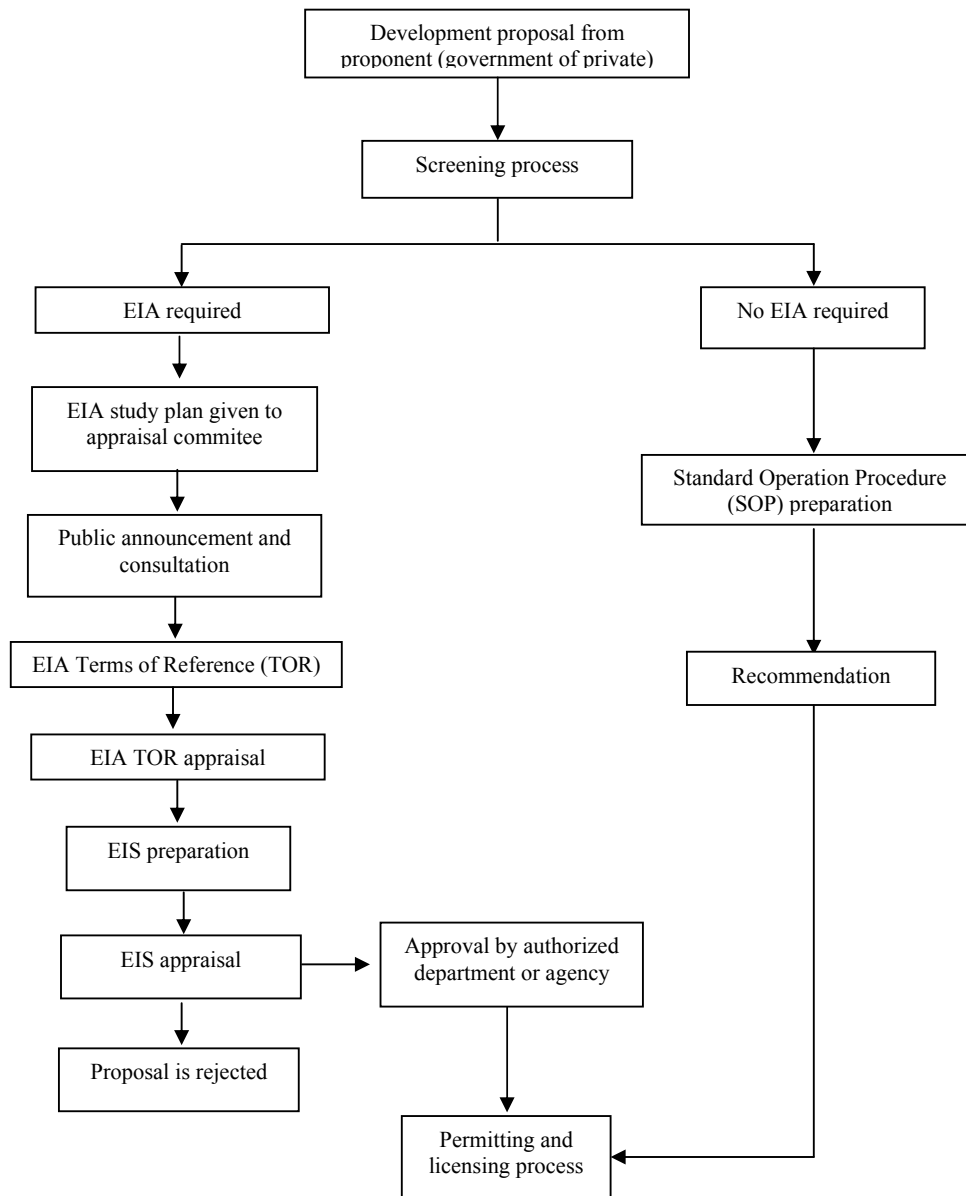
If the project plan appraisal done by committee meet these circumstances:

- the project apparently has significant and substantial impact to environment that can not be cope with the available technology
- the cost to cope the impacts is significant and substantial in which negative impacts are larger than the positive ones resulted from the project

then, the authorized institution for environmental assessment make a decision that the project is not suitable or appropriate to be implemented.

In responding those circumstances, ecological compensation may be interesting concept to proceed the project plan by considering to environmental quality at the same time. It may unfair for proponents and communities if most of project plans are stopped because of the risk to environment relating to the importance of many projects for socio economic development. Thus, ecological compensation may be the last option can be taken as environmental mitigation tool.

However, it is not standardized stated about the hierarchical alternative measurement (avoid, minimize, and compensation) to reduce impacts on environment if the project plan is permitted. The further requirements and obligations in environment management tend to be separated determined. It is depend on particular agency's consideration that responsible on the project plan. Hence, it can not be guaranteed that all permittees fulfil their obligation to maintain environmental quality because of less enforced legislation.



**Figure 4. 1 Indonesia's Environmental Impact Assessment (EIA) procedure** (interpreted from Government Regulation No 27/1999 in [www.bplhdjabar.go.id](http://www.bplhdjabar.go.id))

#### 4.2 Environmental justice-sound perspectives in Indonesia's environmental policies

Justice issue implicitly has been prescribed in Indonesia's regulation to be concerned in every action practices. Relating to the explanation in section 2. 3. 2, environmental justice has connection with distributive and procedural fairness (Corburn, 2002) which means that there should be an equal distribution of benefit and

burdens of environmental quality, and an equal position in contributing decision making process due to environmental issues. Some articles of EMA No. 23/1997 mentioned about the *rights and duties* of people to have a good and healthy living environment, and the right of victim of environmental degradation to get compensation through payment following polluter pays principle or restoration of living environment. So, environmental justice also implies protection on public interests in environmental sustainability (Nicholson, 2005).

Moreover, EMA also implies another environmental justice principle in which there is an equal position of every person to *participate* in the management of living environment and to control the quality of environment. Related to this, society have right to ask claim to court or authorized government institution if they get disadvantages of environmental damage, and they can also claim for damage compensation.

Diversity of social culture, ethnics, and religions in Indonesia are prominent characteristics to be considered in promoting *equal position* in environmental management. It has been recognized that it is important to concern on complex social structure in forming policy related to environmental management especially when has to deal with diverse social life like in Indonesia. These religious values, culture, and social values become other elements highlighted in EMA contents as the government consideration in establishing environmental national policy and spatial planning. It becomes an obligation for government to pay attention on potential, aspiration, needs and values in society in framing the policies, for example by considering traditional communities who count their life on natural resources.

However, there are still some potential social conflicts in development practices. According to the research done by Walker et. al (2000), the experience in Molas village in North Sulawesi implies that there is disproportionate in sharing benefit between government interest and local communities. The national plan to develop Molas village in North Sulawesi as tourism destination has caused social disturbance to local communities that have occupation as farmers and fishermen. The conversion of 70% Molas area from agriculture area and fisheries areas to golf course, one five-star hotel, one three star hotel, a dive center, and a condominium housing development has changed social economic system of the community (Walker et. al. 2000). The government use their power to act in accomplishing only “government interest” without



assessing people and communities' interests affected by major projects. In responding such a condition, social compensation will be necessary.

#### **4.3 Ecological compensation-related issues in Indonesia**

It has been recognized in several meanings that 'compensation' can mean financial payment for damage or it can be defined as an activity designed to counteract harm (ten Kate, Bishop, and Bayon, 2004). In environmental terms, compensation can be defined as a common remedy for people who suffered direct loss of environmentally damaging activities (Nicholson, 2005). It is usual that 'compensation' for ecological matters is put on the sense of concrete conservation actions than that on the simple finance or funds transfer (ten Kate, Bishop, and Bayon, 2004).

Moreover, compensation has connection to environmental justice issues because damage or loss does not only refer to material loss but also immaterial one including loss on health and enjoyment of life (Nicholson, 2005). It becomes worse when victims of environmental damage come from weak groups of communities in social and economics. The injustice or disproportionate of benefits may be resulted if there is disturbances on social structure of particular community groups because of a project.

Ecological compensation has been acknowledged in some countries such as US, Canada, Australia and the Netherlands (Cuperus, 1996; Brown, P. H and C. L. Lant 1999; Rubec and Hanson, 2008; Burgin, 2008) and become their environmental agenda for many project plans. However, in Indonesia, ecological compensation has not been implemented in road sector plan. The existing compensation is only about the financial compensation for the land taken for road construction (land acquisition). Although it is stated in the Road Act (No. 38/2004) that the one of objectives on road development is for achieving sustainable development, the actualization of environmental considerations in road plan is not detail stated in the Act. However, there are still some correlations between the Act correlates and other regulations such as EMA for further environmental actualization in road plan.

Even though ecological compensation in its policies and practices as well has not been standardized yet, there some indications that ecological compensation and social issue may be already discussed through some existing regulations and practices. The explanation below, on ecological performance target; government regulation; coordination; public participation; dispute resolution; and independent oversight, will

give some perspectives on what already Indonesia has related to ecological compensation and social issue within.

**a. Ecological performance target**

The focus of environment quality on broad sense of Indonesia's public is mainly on air and water quality cause by human activities. Many detail standards and dispute resolution have been explored in many researches in the way to reduce pollution on air and water, and how to compensate it. However, through zoning regulation such as National Spatial Planning Act No. 26/2007, the government enacted to keep the green open space acreage at least 30% from the whole of city area. Every action on land has to consider on environmental standard and carrying capacity. The Government is possible to give incentive and disincentive mechanism such as compensation in land-use permits system to encourage proponents to provide natural space on their project plan.

**b. Government regulation**

Regulation implies political will of the government and strategic direction as a reference for implementation of government policy. It also becomes enforcement tool for authorized government institutions to make a prevention action or sanction related to violation of regulation.

Basically, all development activities should have final goal to achieve sustainable development. At strategic level regulation through mid term of national development planning (RPJM 2004-2009), sustainable development for having better future generations is a main objective to be achieved in future development plan in all sectors such as politic, economic, social, and environment aspect. Related to the focused issues discussed in this thesis, the planning regulation has been set agendas in national development related to social and environment. It is stated that the orientation of development is for increasing the welfare of people by improving the management of natural resources and conserving quality of the environment, and the infrastructures that support socio economic development. Hence, all development activities related to environment and infrastructure have main objective for achieving social welfare of present and future generations.

Associating to the goal, the Government of Indonesia has concerned compensation in environmental management mainly as a respond to the increasing scale of development and the increasing cases of disproportionate on distribution of good environmental quality. It has been realized through many studies that development in

many sector to accelerate economic growth cause more exploitation on natural resources leading to negative impacts to environment. Compensation becomes a consequence that obliges to be pursued if the action of plan cause human's loss on accessing ecosystem service. As stated in EMA article 25 (1) and 34 that it is government responsibility to force every action contrary to law and the person by whose fault results in environmental loss to another person, to compensate that loss.

The owners of the project are compulsory to make efforts in preventing and terminating the violation to environment they made, and then make some recovery and restoration efforts for the damages on their cost. However, financial compensation approach becomes main emphases stated in the regulation. It is stated that "*the actions to save, handle, and recover of environmental loss can be replaced by paying a certain of amount of money*". It is indicated that the regulation more emphasizes on financial compensation.

On the other hand, even though it is not directly stated in EMA as a part of environmental management action, there is a regulation that has connection to compensate environmental loss because of human intervention such as road development crossing forest area. Road construction may allow crossing the protected forest and production forest excluding conservation forest if the project had provided land for the compensation. In controlling the use of part of forest land, it is issued the Forestry Minister Regulation 14/2000 that implies easement approach. The approach manages the allocation part of the protected forest, and part that can be used for commercial uses. Nevertheless, the using of the land has to be compensated in for replacing the loss of ecological (natural habitat) area.

The approach allows using a part of forest area for strategic purposes and limited public interests, and it has objective in restriction and ordination of road activities on forest area without changing the status, function or main purpose of forest area. As stated in the regulation, the using forest area by the easement approach has to meet compensation requirements as consequence of taking some part of forest area.

One of the requirements is that the provision and transfer compensation area involve the person or company as owner of project proposed. The status of compensation area has to be owned by the project owner (private-owned) and be transferred to the state to be allocated for forest area property. Moreover, the land for

compensation has to adjacent to forest area, lies on the same river basin or sub river on the same island, and can be deforested in conventional way (Public Works Department, 2007). These principles are in line with internationally standard in providing land for ecological compensation. However, in certain condition, if the obligation to compensate can not be completed on 2 years, the compensation can be replaced by financial compensation.

As a review of compensation in Indonesia, regulatory, there are two compensation mechanisms that have been obliged to project owner to be completed, ecological-sound compensation and financial compensation. In kind-sound ecological compensation is more focused on the project using forest land explained in previous paragraph. Meanwhile the ecological compensation for using wetland or other natural resources has not been stated clearly yet like what has been clearly stated in US regulations. Financial compensation is another alternative that can be taken to fulfil the obligation of project owner to compensate environmental damage and loss caused by the project.

Related to social issues in environmental management, EMA also regulates all activities over Indonesia's land to accommodate environmental and social considerations such as religious value or traditional value in their project plans. It also implies a means to balance between economic interest, environmental preservation and social welfare objectives by considering the persistence of present and future generations. Through the act, it may be indicated that environmental impact assessment (EIA) is an effort to reduce environmental impact and social conflict implications as well that cause by economic-oriented activities such as road development.

### **c. Coordination**

To maintain the perspective that the social, economic and ecological elements are integrated like the spirit of sustainable development, environmental management is not only a matter for environmental agency, but also it links to other institutions: intergovernmental institutions, private parties as investor or project owner, and societies. Thus, they are part of planning process and together make coordination in decision making process and looking forward the alternatives to reduce negative impacts to the environment. Taking to road plan case, government institutions that may be involved in road development are Land Affairs for land procurement, Forestry Affairs in connection with using part of forest for road, Transportation Affairs in relation to transportation problems in road plan, Social Affairs in relation to social

problems in particular ethnic groups caused by land procurement and resettlement, and Culture Affairs in relation to archaeological site that might be found during the road project (Public Works Department, 2007). These institutions take a role in managing environmental quality during the plan and the implementation of road project.

Moreover, coordination is also made among different level of government institutions. The enactment of Government Regulation No. 27/1999 established EIA administrations in the Environmental Impact Management Agency at provincial and district level. This means that responsibilities to implement and supervise EIA are distributed to all level of government at national, province or district level. This arrangement is expected to generate a clearer and more integrated coordination under one competent leading agency (Purnama, 2003).

#### **d. Public participation**

Public awareness of the importance to have development with environmental consideration could be gained through public participation in development efforts (Hardjosoemantri, 1994). Furthermore, the provision of direct public involvement enhances the transparency of EIA process and the effectively of EIA implementation (Bappedal 2000 in Purnama, 2003 and BPLHD). Public participation can enhance communication and mutual interaction between the government, community members, social organizations, and private parties; so that suspicion and worried felt by community especially affected groups may be reduced and better managed. Hence, instead of sharing information about the benefits and possible impacts from the project plan, better understanding of proposed project can be achieved since the early stage of project plan. In developing countries such as Indonesia, there has been a tendency to improve the EIA mechanism including the enhancement of public participation during the EIA process (Purnama, 2003) that has been established through some regulations.

Through the Government Regulation No. 27/1999, public involvement has been initiated since the early stage of EIA process (EIA TOR preparation). Community members and organizations that have concern to environmental problem and to the solution are asked to give input for the planning process such as road planning, and assessing the impacts. Moreover, the participants also involve in the efforts to control environmental impacts in which the participants can propose a claim for impacts that they get from environmental disturbances caused by particular human activity such as road development.

According to the decree of the Head of the Environmental Impact Management Agency (EIMA) No. 08/2000 about public involvement and information transparency in EIA process, there are three main objectives of public participation in EIA process:

- Giving public information about project plan and the estimation of environmental impact that might be resulted
- Receiving response, input, and suggestion from public to project plan and of what essential issues to be considered in EIA study
- Making dialogue with community to looking for some alternatives in environmental impact management

Public participation is also encouraged through the National Spatial Planning Act to control the activities that disobey to spatial planning and to ask a claim or compensation for the inappropriate activities causing disadvantages for them. It can be indicated that public is asked to actively take a role in controlling public land-use.

#### **e. Dispute resolution**

It has been realized that there are some possibilities of conflict among different actors and interests during managing of the environment. The Government of Indonesia through Environmental Management Act (EMA) 1997 has established a reference providing alternatives to overcome conflict that may be emerged in environmental issues. It has concerned environmental dispute resolution that can be taken through court based (litigation) and non-court based (mediation) as stated:

*“environmental dispute resolution can be reached through the court or out of court based on voluntary choice of the parties in dispute”*

Furthermore, it is explained that the target of the ‘out of court’ based dispute resolution is to reach agreement between the disputing parties concerning form and size of compensation (for environmental damage or pollution) and/or carrying out particular actions to prevent further environmental damage or pollution. The process of reaching agreement may be facilitated by a third party who may or may not have authority to make a final decision or solution of dispute resolution.

To accomplish ‘out of court’ based dispute resolution, the Government of Indonesia or community can compose an independent institution providing service for reconciling different interests. For strengthening the further position of the institution, it is prescribed on Government Regulation 54/2000 elaborating legal requirements of institutional settings and the agreement process within. The main task of this institution

is to give independent service for disputed parties by offering some alternatives for dispute resolution.

The independent institution becomes an alternative to solve environmental disputes or conflicts in 'out of court' mechanism to be more effectively and efficiently received by conflicted parties. It is expected that this alternative will encourage community to pay more attention in reducing and solving environmental problems by strengthening public participation and consensus in environmental management. The existence of this regulation can be taken as a prominent base for further dispute resolution between affected communities and project owner by reaching win-win solution agreed together.

**f. Independent oversight (supervision)**

To ensure that the project is implemented as the plan, it needs comprehensive oversight and credible oversight institutions. Oversight is needed to ensure that there will be an efficiency on the implementation of project, and the project also will be save to environment by using some mitigation measures to reduce the risks of impacts to the environment as stated in the EIA study report and environmental management regulations.

In Indonesia, according to regulations and experiences, oversight can be carried out by government institutions and public involvement. Mainly the Environmental Minister has responsibility in the process of oversight. However, the responsibility can be transferred to lower level of government institution. So the oversight of project plan is taken closer to the plan. The oversight also can be carried out by specific institution formed by government. According to Government Regulation No. 27/1999, the specific institution has responsibilities in managing the impacts of project to the environment by:

- monitoring and evaluation of the implementation of environmental regulations in practice
- testing the report given by project owner
- reporting oversight evaluation to Environmental Minister periodically, at least twice in a year

There still some opportunities to apply ecological compensation in more sustainable way in Indonesia. However, there are some challenges that will be faced by

Indonesia related to the actualization of ecological compensation as explained in the next section.

#### **4. 4 Challenges toward socio-ecological compensation in Indonesia**

The explanation above indicates that there are still some weaknesses in the concept and the practice of ecological compensation towards environmental and social sustainability. These weaknesses become the challenges in a way forward to implement more sustainable ecological compensation in the future, such as:

##### **a. Ecological performance target**

It is apparently, the specific environmental goals are not explicitly stated in policy documents in national scale. The condition might cause negative implications to the strength of enforcement on environmental violation. Meanwhile, there is an increasing level on nature area destructions caused by human activities on land in urban area and also country side. The spatial planning only stated to keep green space in urban area, while the environmental destruction has extended to rural area. Therefore, it will be a challenge for the government to reduce the extension for environmental destruction.

Moreover, financial compensation without appropriate mechanism ensuring the allocation for environmental purpose tends to inefficiency in achieving back of nature area loss.

##### **b. Regulation**

There are some issues indicating the challenging conditions to achieve environmental and social sustainability in the way of ecological compensation implementation. It has been stated in the Environmental Enactment Act no 23/1997 that all project plans that have potential to have significant and substantial impacts are obliged to make environmental impact assessment (EIA) in getting permit or license. However, the measurement of substantial impacts especially for road development has not concern yet to natural habitat of species or ecosystem disturbances that might be caused by the road development (see table 3. 5).



**Table 4. 2 Criteria for public works-related project plan to have EIA**

<b>Project Plan</b>	<b>Scale</b>	<b>Scientific reason</b>
Toll road development	≥ 5 km	Traffic generation, noise nuisance, vibration effect, high emission, visual disturbance, and social impact
Road development or improvement of existing road that need more land	City : length ≥ 5 km; area ≥ 5 ha Medium city : length ≥ 10 km; area ≥ 10 ha Rural : length ≥ 30 km; area ≥ 30 ha	Traffic generation, noise nuisance, vibration effect, high emission, visual disturbance, and social impact
Subway/underpass/tunnel construction Bridge construction	≥ 2 km ≥ 500 m	Has potential to cause impact on land subsidence, groundwater, emission, traffic, noise, vibration, visual; disturbance on energy and telecommunication network facilities; and social impact

*Source : Environmental Minister Regulation No. 11/2006*

Furthermore, mostly environmental policies initiations in Indonesia are highly dependent on external push factor. The analysis of impacts on natural habitat of species or ecosystem balance apparently will be considered when it applies on donation project from international organizations such as World Bank. The condition has been supported by Purnama's statement (2003) that external factors such as financial donor agencies or multinational companies that operated in Indonesia could give more power to the government to make EIA as determinant requirement in decision making. The environmental actions or policies of the government is rather to response external pressures than the domestic's ones (Boyle, 1998). Thus, the communities have weak concern and commitment to environmental consequences of development activities, whereas commitment is basic foundation for effectively of further actions.

Different regulations related to environmental issues are less integrated. In fact, the integration gives more enforcement for agencies and public to support particular policy such as ecological compensation. Moreover, the policy to make ecological compensation as an alternative for unavoidable impact has not been legally standardized in higher level of laws. Actually, ecological compensation-sound policy has been stated in Forestry Minister Regulation that force proponents for making land compensation for activities or projects other than forestry's activities e. g. limited scale of road

development. However, the policy has not been clearly stated in EMA which has higher level of laws.

Moreover, financial compensation that becomes main issue in many environmental regulations may be a challenging issue for the implementation of ecological compensation. The approach has been taken as the simplest way as solution for environmental problems which is apparently hardly to achieve 'no net loss'. Hence the appropriate mechanisms or strict regulations are needed indeed.

### **c. Coordination**

Coordination among parties involved such as between government institutions, government and private parties, or between government and community members is important for law enforcement and looking forward alternative solutions that will distribute benefits and will not make disadvantage particular social groups or different interests.

However, different actors are still separable elements in environmental management actions even though regulation stated to do the other way around. According to Boyle (1998), public and private sector leaders and decision makers in Indonesia give resistance and less support to the institutionalization of environmental protection policy for achieving environmental objectives in planning and permitting process. Whereas, to be effective, coordination among theirs in sharing share information, and completing project planning and its implementation in sustainable way is needed.

### **d. Participation**

Indonesia culture is characterized with a strong paternalistic authority, and a pressure to be dependent and loyal to particular group that are reflected in hierarchical system (Boyle, 1998). The system leads to the formation of complicated bureaucratic institutions. In some cases, even though there is public participation especially affected group involvement in environmental management policy, the decision is taken based on opinion mainly from people who has more power in bureaucracy or in politics. Moreover, decision making procedure in EIA Commission is not supported by the availability of dispute resolution mechanism (ICEL, 2007) whether in which condition information could be shared, in which condition conflicting views, values and proposals can be discussed, and which alternatives can be taken (Boyle, 1998). As a result, legal

recognition of public participation in EIA process often and merely becomes symbolic participation.

Another challenge in making public participation due to whether the project owner is used domestic initiatives or foreign. The dependency of environmental protection efforts on external pressure or funding agencies like the World Bank or international NGO lead to less frequent or even no opportunity for public involvement (Boyle, 1998). Consequently, it encourages internal conflict of interests and thus lack of public support.

**e. Dispute resolution**

As stated in environmental management regulations such as EMA, community members have the right to make a claim for the impact on his environment caused by human intervention such as road development. However, the detail mechanism in reporting claim by public as one of elements for accessing justice has not explicitly provided by any legislation. The condition becomes worse by complicated bureaucracy (ICEL, 2007).

The fix state of institution in managing dispute resolution will give more clearly information to public on claiming mechanism. In Indonesia regulation there is an alternative to use mediator or other third party as dispute resolution tool, however, the approach that is used for the third party institution has not been standardized yet. Some environmental NGO's or government institutions that have desire to reconciling the conflict may operate individually.

**f. Independent oversight**

Government has the highest authority to oversight all development activities during the planning process, the assessment study, and the implementation to not cause harm to environment. Public is also encouraged to make a self control to the environmental access of they had. Nevertheless, the actualization is hardly to be independent whether it is done by government or public. In Indonesia in which politics groups or bureaucracy structure has dominant power, reporting oversight process of project implementation is apparently as a ceremonial process. There is only a few or none of the report that has been followed by further actions especially when there is no politic power to make follow-up action such as reducing the impacts to the environment or reconciling social conflict caused by the project. Hence, it needs strict monitoring

and evaluation to ensure that the compensation will be actualized to reach environmental goal.

#### **4.5 Concluding remarks**

There are some improvement in environmental regulation and practice in Indonesia. The establishment of environmental policies due to other activities on land will be as basic capital for further actions towards sustainable development. However, the actualization of ecological compensation in Indonesia still has some challenges to be faced in the future. The development orientation that mainly emphasize on economic growth will become a source conflict with the other efforts aiming in environmental preservation.

Even though the concept of compensation for nature area loss is not completely new for environmental regulations in Indonesia, the implementation of ecological compensation will have some constraints.

- Most of the project plan only mention about how to compensate private land that had been purchased for the project by certain amount of money for each square of land taken (land acquisition). There has not been stated to make compensation for nature area loss.
- Unclear and indefinite information about environmental goals, and mechanisms that is stated in the environmental regulations may one of factors that influence less effective the implementation of ecological compensation in Indonesia.
- Financial compensation that is common as the simplest way to be taken by proponents seems become justifications on what they have been taken from environment. On the other hand, it is politically weak on commitment for environmental protection agenda and thus, it is hardly to accommodate the agenda by politics leader. Consequently, there is inefficiency to achieve environmental objectives and low enforcement of violation to nature environment.

However, the increasingly public awareness on environmental degradation, the intensification public participation in every decision making process, and the improving regulations managing environment and social issues, provide positive points to encourage the implementation of ecological compensation in sustainable way.

In effort to improve the practice, the secondary impacts to social life caused by enactment of environmental policy also become prominent considerations for actualizing ecological compensation in environmental and social sustainability way in Indonesia. The culture in Indonesia tend to much more on protecting livelihoods dependent on natural resources rather than on ideas on protecting wild lands, endangered species, and biodiversity, like what have been thought by Western regulations (Boyle, 1998). In other words, the culture of Indonesia's people more emphasizes on how to survive and get welfare that they can get from natural resources other than only to conserve the nature area. These conditions will be taken as considerations for the implementation of ecological compensation in Indonesia.

The further discussion on the possibilities of ecological implementation in Indonesia will be on next chapter based on the discussion in chapter 3 and 4. It will be also discussed the different contextual of (ecological) compensation issues between US and Indonesia so that it may take some lesson learned as considerations for further implementation.

## CHAPTER 5

### TOWARDS ECOLOGICAL COMPENSATION IN INDONESIA

In most of developing countries like Indonesia, environmental issues have not yet become major development objectives. It is apparently that the development orientation still focuses on efforts to accelerate economic growth. However, it is important to discuss it further in order to develop the concept of sustainable development like what is stated in international directions. The discussion about ecological compensation issues in different part of the world like between US and Indonesia will give some insights on the possibilities and challenges found in establishing the concept. The US experiences in more than 30 years of using ecological compensation in their environmental regulation can be taken as lesson learned for Indonesia. However, the contextual differences (i. e planning system, government structure, economic resources, etc) between US and Indonesia may influence the transfer of ecological compensation into practice in Indonesia. Related to some different economic and social condition, therefore some adjustment may be needed in transferring the policy of ecological compensation concept to Indonesia.

In general, there is an increasing of awareness about environmental problems over the world. It has been developed some concepts to overcome the problems, especially after Rio Summit. Through these directions, many countries are encouraged to establish some environment measurement to reduce the destruction. It was started by assessing environmental impact because of human activities through practical analysis like EIA. Then, it was realized that the impact is not only to be described but also to be really measured. So, the real actions may be taken to reduce the impact through *avoid* and *minimize* or prevention and mitigation actions. However, after long debates it was recognized that there are some environmental impacts remains and become worse over time due to the acceleration of development. It may be indicated that there are unavoidable impacts remain, so that it has to be considered to take *compensation* for environmental assets loss.

The ecological compensation concept has not been yet established in the environmental regulations of Indonesia. There are some considerations if Indonesia intends to involve further in the compensation concept. Other than ecological value target to be achieved through the concept, it also needs to address social implications

that may be resulted from the implementation of ecological compensation. Various cultural values and social structures that exist on Indonesian community may result on more complicated social problems compare to the more homogenous US community. These social issues related to ecological compensation become main topic that will be discussed further in this chapter.

Related to those considerations, this chapter will be analysed the comparison between US and Indonesia due to ecological compensation and social-related issues. It also will discuss the possibilities the implementation of ecological compensation with considering contextual condition and social values in Indonesia. So that in the end of this chapter, it can be defined what the issues or requirements that should be stressed and some constraints may be found in the way for the implementation of ecological compensation in Indonesia.

### **5. 1 Comparison of (ecological) compensation in US and Indonesia**

The implementation of ecological compensation in US as discussed on chapter 3 may be taken as lessons learned for Indonesia by considering the societal context. Through comparison on six elements in assessing more environmentally and socially sustainable concept (as explained in Chapter 2), it can be determined some key points to be concerned in a way towards social-ecological compensation. Those elements are:

- a. Ecological performance target
- b. Government regulation
- c. Coordination
- d. Public participation
- e. Dispute resolution
- f. Independent oversight.

The discussion in every element contains some points related to ecological view, and also some insertions of social issues that related to each element. On the discussion, it will also highlight some important issues (indicated by numbers and italics) that should be concerned towards the implementation of ecological compensation in more socially sound.

***a. Ecological performance target***

The specific target practiced in environmental action or implementation will minimize misinterpretation of the policy by different actors. The target also becomes a guideline for different authorities to support the achievement of good environmental performance. Thus, it may result in efficiency of actions at lower cost, but the goals still can be achieved.

The same assumption applies also for ecological compensation concept. The establishment of particular goal on environmental performance such as ecological compensation implementation influence the interpretation on how to deal with the concept, even though it may accomplish through by different levels of government or different approaches.

Related to this, in general, the Government of US has established the *sequence (1)* of environmental performance actions starting from prevention, minimize (mitigation) and at the end compensation for unavoidable environmental impacts aiming to ‘no net loss’ goal. The ‘no net loss’ goal for biodiversity and nature landscape has become a *clear environmental mitigation objective (2)* or a requirement in US’s mitigation policy that should be concerned by each project. Particularly for ecological compensation, the ratio between new area as compensation area and impacted area is determined which is at least 1.5 : 1. These requirements will direct the government actions to get the successful of ecological compensation towards sustainable development. To achieve this target, in site and off site compensation may be possible to make larger compensation area as the option to fulfil compensation responsibility by proponents or third party. The location that adjacent to impacted area or maximum 1 -2 km from impacted area will be a place that has first priority to be chosen as a compensation area (Cuperus, 2008, personal communication).

However, the flexibility on site selection for compensation has a risk to trigger social conflict between proponents or third party and landowner, especially when it has to face culture value on landownership such as in Indonesia. The problems on *landownership (3)* remain as important consideration in getting the land for compensation. Many of land in Indonesia have cultural binding as heritage property from ancestors, and it has to be preserved for next generations after. Here the social implication caused by ecological compensation may be emerged. That issue on landownership has potential to be a problem to reconcile, so ecological value target still



can be achieved. This is one of considerations if ecological compensation is implemented in more socially sound in Indonesia.

Moreover, in common practice, there has not been clear practice indicating the sequence of mitigation action (avoid, minimize, compensation) for natural habitat and biodiversity. Indonesia's environmental common practice use two instruments to reduce environmental degradation: efforts in planning process and efforts in implementation. In planning process, the authorized government institution can decide to stop project plan if the projects are too risky for environment and no available technology to reduce it. Then, after project get permit, proponents have responsibility to reduce environmental impacts during the implementation of their projects. However, this action mostly are done for reducing pollution to water, and no certain environmental performance target related to land compensation as a guideline.

In short, it may be concluded that implicitly the environmental protection practice in Indonesia only concern to avoid and minimize actions that are still limited on pollution or floods issues and the enforcement for development actions to keep green space, not to biodiversity conservation yet. The ecological value target in environmental performance actions become vaguer when at a broader level, environmental values are not deeply embedded in society. Those factors lead to undervaluation of natural resources and environmental services (World Bank, 2008) and different perspectives on determining what the best for environment is. And, at the end it may cause environmental destruction become worse.

#### ***b. Government regulation***

Regulation is one of important elements to guarantee the consistency and commitment of various actors involved in development actions, and also to avoid misinterpretation of a policy in protecting public interest. Regulation also becomes important instrument as a tool for the government in completing its checking and balance function. It determines the distribution of responsibility among government institutions from planning process to implementation and oversight mechanism. The implementation of a plan or policy may be enhanced if it is established an appropriate regulation as main guideline in practice, so the government performance is more accountable.

In general, the Government of US has clear and established regulation in managing environmental issues including on the implementation of ecological compensation including for the road development. Through several environmental and transportation policies or regulations, the Government supports the establishment of the concept in *detail and integrated directions* (4). Other than the clear and detail of the directions stated on those ecological compensation regulations, those also explicitly bind to other agencies at state or federal level. The policy is not only become responsibility of environmental agencies, but also it becomes responsibility for other agencies such as the Transportation Department to follow the directions in supporting the achievement of sustainable development goals. The existence of those regulations become basic guidelines for government institutions or agencies and other actors related to ensure that their project plans are on the right track to achieve desirable environmental goals (no net loss). Besides that, the existence of the ecological compensation reflects *political and public commitment* (5) to develop efforts in reducing environmental problems.

In contrast to condition in US, environmental issues including the compensation mechanism are still rare to take in to account in project plans in Indonesia. The economic orientation has still become main goal of development for short term and longer term plan as well. Even though there are some regulations related to environmental quality protections, it is not sufficient to enforce development actors or proponents to reduce project impacts to environment. Less detail and unspecified regulations for ecological compensation practice may become one of important factors causing violation to environment while many interpretations of existing rules may be occurred in different levels of government.

Even though in Indonesia there is a regulation that may be a kind of ecological compensation policy, it has not been integrated in higher level of regulations or at national scale. The establishment of that regulation tends to more sectoral agency initiatives that cause less power to be enforced. It is different with what US made to integrate ecological compensation policy in a national regulation like Clean Water Act. Ecological compensation concept is stated in Federal law tighten up all government agencies at federal, state or lower level. The fact, the integration system of ecological compensation regulations has important role in supporting the effectiveness of efforts to minimize environmental destruction caused by projects such as road development.

The existence of political and public commitment on resolving environmental problems reflected on regulation and practice in environmental protection is the other contextual differences between US and Indonesia. Based on the limited environmental regulation facts, it may be indicated that Indonesia has lack of political and public commitment on resolving environmental problems. It may be a basic problem causing ineffectiveness in solving environmental problems. The issues relating to environment protection such as ecological compensation are often been ignored by most of politician and bureaucrats in Indonesia. As stated in chapter 4, the external push factors such as Western practice or funding from World Bank or ADB tend to be significant factors that encourage the politician and bureaucrats in Indonesia to make environmental protection efforts. Consequently, public and politician have weak commitment to solve environmental problems. Environmental policy such as policy to compensate environmental destruction tends to be more reactive approach and only complement procedure. In contrast, ecological compensation in US has been supported by public, politician and legislative commitment, thus, it has more power to be enforced to all institutions.

However, it does not mean that the government of Indonesia totally ignores the environmental problems and the mechanism of compensation. From some the existing regulations issuing environmental problems, it is explicitly stated in those environmental regulations that financial compensation becomes main mechanism for replacing environmental destruction causing by projects. It is a simplest way that can be taken by proponents to fulfil their obligation to environment. However, if the approach is used for obtaining the land as compensation area, it has weakness related to social issue in Indonesia. According to Kolhoff (2008, personal communication), financial compensation mechanism used to obtain the land will face difficulties when it has to deal with cultural landownership like common in Indonesia. Hence, there is uncertainty in preserving environmental quality and social life.

The same idea has been stated in US and Indonesia's regulation in which social value such as religious values, culture, ethnics and others are a part of main considerations on the establishment of environmental policy. Protection of public interest and equal position to have environmental advantages reflecting environmental justice spirit are explicitly regulated at national law. However, more complex societal

structure in Indonesia at culture and social-economic class will remain as important elements of ecological compensation in practice.

***c. Coordination (in implementation)***

Coordination in the implementation is another element that is important for avoiding conflict of interests and for realisation of regulation into action. Supporting idea and resources from various institutions through coordination will enhance the effectiveness of environmental program implementation and its enforcement system (ICEL, 2007). The experience of US indicates that coordination is guaranteed through the establishment of one *competent leading agency (6)* for ecological compensation. The Army Corps of Engineers supporting by EPA has important role to coordinate federal, state government institutions in accomplishing ecological compensation as stated in national's environmental law.

Moreover, in US environmental practices, the government is encouraged to make partnership and coordination with private, conservation organization, and affected community groups (*tripartite coordination (7)*) to support ecological compensation implementation. Particularly if permittees can not accomplish ecological compensation on their own initiatives and finance sources, the responsibility on ecological compensation may be transferred to third party organization such as land trust or mitigation banks. To get the land for compensation, coordination also has to be made with communities especially with landowner and people affected. Thus, government, private (bank sponsor) and land trust should make coordination to determine what measure will be taken for compensation by also communicating and negotiating with affected communities.

Moreover, to increase efficiency in management and coordination among interest parties, the implementation of ecological compensation in US tends to more emphasize more on larger scale of compensation area than smaller one or scattered areas.

In general condition of Indonesia, coordination also becomes main issues that have been highlighted for achieving good governance in Indonesia, especially after the establishment of decentralisation. The same perspective has also been applied in managing environmental problems. The EIA procedure may be preceded on lower level of government by maintaining coordination with higher level. Moreover, the formation of EIA committee in every government levels reflects coordination, done by leading

institution, as a key point for establishment of decisions taken. The committee are consisted of representatives of different government institutions that have responsibility in assessing environmental impacts of project plans.

However, Indonesia faces many constraints in its efforts to improve environmental coordination, especially for ecological compensation implementation. Other than limited financial and technical resources, the constraints include a fragmented institutional structure, limited coordination among ministries and agencies at national and local levels (World Bank, 2008). Most of government institutions only focus on sectoral issues with limited concern to environmental issues. Even though there is a leading authority such as Ministry of Environmental or Head of Environmental Impact Assessment Board (BAPPEDAL) that responsible in environmental management at national scale, these institutions are still less effective to coordinate the implementation of environmental policy, especially conservation policy, at national scale. In policy making process, environmental issues are often being ignored other than economic sector. In other words, this leading authority has limitation in planning, implementation and oversight function to guarantee environmental justice and sustainability for future generation (Walhi, 2004)

The limited coordination is not only among government institutions, but also with community. Sometimes people especially affected communities do not know what the government plan to do. The people have less of access to get sufficient information, participate and rights to have justice for their social life.

Furthermore, coordination between the government and private or conservation organization in environmental management is also still limited. The coordination with private is only limited to permit procedure, while coordination with conservation organization is only narrowed on sharing information in which compensation procedure is still being unrecognized. However, according to US experience this private and conservation organization such as mitigation banks and land trust can be alternatives for the implementation of ecological compensation<sup>8</sup>.

These lacks of coordination issues especially in environmental issue may result on scattered environmental actions on different places or projects basis (small scale actions). This condition leads to inefficiency of environmental performance in general

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<sup>8</sup> see more detail in section 5. 4

especially in reducing the environmental impacts. Hence, it needs some improvements on coordination among government institution, private, nature conservation organizations, and also community to make ecological compensation policy in Indonesia success in reaching goals.

#### ***d. Public Participation***

US regulation stated public including poor community and minority population to actively involve in planning process and its implementation to reduce potential conflict since the early of the process. *Citizen participation (8)* has been recognized as important element in influencing environmental issues in US (Kasperson, 1978 in Potter and Norville, 1983). Though participation and consultation in two way communication, it can be a way to accommodate social value. According to Creighton, Chalmers, and Branch (1983), public involvement is a mechanism for information exchange and a source of the value context that influence the successful of planning process. So, the participation may reconcile potential environmental and social conflict of interests not only during the process of decision making, but also during the implementation of ecological compensation.

Related to that, public participation is not only about community involvement in decision making process of environmental issues, but also it relates to *the role of community on nature area management (9)* after compensation is implemented. The US practice in ecological compensation indicates that community members are encouraged to direct involve in nature area management, for example through involving in land trust committee members. Together with other members that have different interests, they manage the nature area to allocate the area for many purposes depending on their agreement between government, proponents and other actors involved. For example the practice of land trust especially in Community Land Trust (CLT) in US may be an alternative tool where community members are organized to manage and supervise their own land for environmental and economic purposes as well. The enhancement role of community on environmental management is one effort to empower communities especially for affected groups.

In line with that, there is an improvement of public participation mechanism to be used in all Indonesia's planning process. Related to environmental management rules, the Government of Indonesia has established public participation as a part of key points

during EIA process. The practical regulation on public participation in the process is stated in the Head of Bappedal (EIMA) regulation No. 08/2000. It is stated that the proponent is obliged to conduct consultations by two-way communication with the affected communities and observer groups during preparation of the KA-ANDAL (EIA TOR) document. Then the results of public consultations are to be used as consideration in the scoping process (Final Report, 2005) to determine what measure should be taken. The participation is also encouraged on the implementation of project whether the permitted projects cause impact to community. The effected communities can issue a claim if they get disadvantage from projects impacts.

In most practice cases in Indonesia, participation often only involves certain people and not represents affected groups as a whole. The limited persons who involved in the discussion sometimes may not represent the opinion of poor people (Kolhoff, 2008, personal communication). The condition of poor people that illiterate or lack of information cause the existence of these groups is marginalized. The decision is taken based on the consideration of people that has more 'power' in education or social class. This problem becomes important point to be concerned in the implementation of ecological compensation.

On the other hand, it still a rare case that community members especially affected groups are participated directly in nature area management. Most of nature management are done by the government, and people are restricted to have an access on using nature land. In other case, even though there is a kind of community involvement on nature management, it has been done individually without particular control from leading organization such as land trust or mitigation banks involvement. It can take an example from traditional community in Kalimantan that has initiative to protect the nature area. It may be a potential movement that can be developed if ecological compensation is implemented. Unfortunately, it has been done individually in scattered areas. In Indonesia, it seems no established specific regulation managing a partnership with conservation organization or mitigation banks (sponsor) for compensation management in a long term like in US.

Shortly, even though participation has been generated in planning system of Indonesia, there are still some limitations in practice, especially in environmental performance activities.

### *e. Dispute resolution*

The common dispute that may be happened as the main focus on this thesis is when there is a disagreement on using the land whether for environmentally or socially purposes. Many disputes can be resolved through communication and negotiation, other than courts which can help to reduce costs, delays and legal action (Department of Justice, 2008). However dispute resolution through courts is common to be used as a tool for reconciling different interests.

In US, dispute resolution can be made through the courts. However, there is another *alternative out of the courts (10)* which is through a third party as independent institution formed by government or community. The experience in US in ecological compensation gives an insight about the existence the third party institutions as an instrument that may accommodate different interests in the implementation of ecological compensation. These third party institutions may be represented in a form of land trust and mitigation banks. Land trust is positioned as an independent organization while mitigation banks as a private institution that both receive permittees responsibility to compensate after the agreement is achieved. These institutions also have responsibility to manage the compensation area for long term towards environmental and social sustainability. Hence, land trust and mitigation banks may have function to accommodate ecocentric and anthropocentric interests. Ecological compensation is completed while the projects plan still can be continued by considering social impacts at the same time.

Another issue that has potential to be conflicts is different interests among level of government institutions, and this is what happens also in US. The allocation of responsibilities between levels of government may have potential to cause a conflict, for example in determining which authority that has responsibility to manage compensation area lying on different administrative areas. According to the Conservation Foundation (1990), the government of US try to reconcile the dispute is through several ways:

- *Freedom of information act (11)*. It means that the information held by various government agencies can be easily accessed.
- *The role of the courts to resolve disputes between institutions (12)*

In Indonesia, it has also been recognized the role of independent organization dealing with environmental issues. But, it is apparently that there is no specific an established form of non profit organization like land trusts or mitigation banks in



compensation scheme. Most of financial or ecological-sound compensation scheme at the end are accomplished by permittees' initiatives, even though it may be a discussion of what compensation should be taken for affected groups facilitated by a third party. The assistance given by the third party is only for temporal action or ad-hoc basis. It means that the assistance will be stopped after the agreement between affected community members, the government, and the permittees is reached. Thus, the disputed or social problems that may be found at the implementation for compensation after the agreement are handled by permittees themselves. Moreover, there is no guarantee that permittees will complete their responsibility to compensate environmental destruction they made and consider to social life.

However, there is a kind of dispute resolution mechanism that informally embedded in culture of Indonesia. Commonly, this mechanism involves mosque or religious leaders, community's figures, expertises to discuss a community's problem and at the end try to make a conclusion or decision what should do to overcome the problem. In Indonesia terminology, this mechanism is called *musyawarah* (a kind of discussion) for *mufakat* (agreed based on common understanding). This approach can be a potential to be maintained and developed for the socially and environmentally sustainable of ecological compensation in Indonesia.

In another issue, by seeing Indonesia after decentralisation, some responsibilities of national government are shared to the lowest level of government institutions. Government authority is shared between national, province, or district's government institutions in managing development. However, sometimes there still some possibilities of dispute among them in determining who is responsible for certain issue especially when there is a problem to be resolved. Thus, the conflict of interest between different levels of government still becomes an issue in accomplishing ecological compensation in more sustainable in Indonesia. On the other hand there are some restrictions given each government institutions to provide free information to be accessed by others.

#### ***f. Independent oversight***

In general, the oversight done by government and community is common in the practice of US and Indonesia's environmental policy, but the different constraints faced in implementation may result different approaches and outcome. Oversight has important role in the development to ensure whether the projects are implemented as the

plan, to identify the problems in practice, and then to formulate the solution and improvement needed.

In US, the government, as the highest level in monitoring, supervise the implementation of permitted projects based on project plan and regulations, while community and legislative members also can take a role in supervision. One of institution examples that may be lead to the independency of oversight formed by government institution is by establishing Committee on Mitigating Wetland Losses. Mandated by EPA, National Research Council (NRC) formed the committee *to evaluate mitigation practice*, as regulated under Section 404 of the Clean Water Act, and also *evaluate the institutions conducting mitigation projects*. Legislative oversight controls over the government and then to create a further forum for intergovernmental negotiation and direct lobbying to redirect the practice. Meanwhile the community members also have a right to make supervision by reviewing the projects implementation. The review result will be used to redefine goals and approaches of the projects.

The oversight done by community may give more advantages for independent mechanism. Other than it may free from politics system, community's oversight also empower community members to actively involve in planning process and to have self control in maintaining environmental quality. The institutions involved in ecological compensation practices may be also another alternative to make oversight more independent. Land trust and mitigation banks could be a tool for better safeguard for the implementation of ecological compensation.

In Indonesia, the government also has the highest authority to supervise the implementation of projects. However, the oversight done by the government of Indonesia often faces the *complex politics and bureaucracy system* (13). Dominant political power may lead to form's sake process of supervision without any further action and enforcement. Thus, if there is no *improvement in the oversight mechanism* (14), it may hardly to complete the oversight of projects independently.

However, it still rare case in Indonesia that affected community can participate directly in supervising environmental or social impacts caused by the implementation of projects, especially through involving with specific third party organization. Most of

community participation in oversight mechanism are made individually with small scale, and thus have less access to the court to issue the claim on disadvantage they get.

Furthermore, the existing practice of environmental Non Government Organizations (NGOs) has limited influence to determine what decision that appropriate to be taken. Most of them only give information to government on the problems they seen, however, the final decision is on government's hand in which prone to have politic and bureaucracy constraints. It may be indicated that the role of the organizations to be an alternative for independent of environmental quality supervision in Indonesia practice are still less power, and need more innovations in the institutional settings.

### **5. 1. 2 Resume of the comparison analysis**

Based on the discussion on those six elements towards social-ecological compensation, it can be generalized that the concept of ecological compensation in Indonesia may be defined as *premature concept* meaning it has not fully yet been implemented as the way it should be. Comparing to US in more than 30 years experiences in mitigation policy, Indonesia is still left behind in the practice of ecological compensation. It means that there are still a lot of improvements in context and process elements of ecological compensation if the Government of Indonesia tends to implement the concept as a part of established environmental policy. The comparison of ecological compensation between US and Indonesia is displayed on table 5. 1.

Looking at the condition of Indonesia in table 5. 1, it can be indicated that there are some points that still need to be paid attention to. Supported by the existed positive points, both of those points may become starting points for the implementation of socio-ecological compensation in Indonesia. However, there still need some improvements that should be prepared for the implementation of ecological compensation in Indonesia.

The differences societal context between US and Indonesia may influence the starting points for the implementation of ecological compensation. These points will determine what specific issues that has to be maintained as starting points, and what others that has to be developed or created by the Government of Indonesia. Hence, if the government intend to implement ecological compensation concept, it is necessary to consider to these points. Table 5.2 briefly describes some aspects to find out whether it

has been good or still need improvement. Also it has to be noted that challenges faced by Indonesia is not fully the same as US considering the localities condition.

**Table 5. 1 Comparison of (ecological) compensation between US and Indonesia**

<b>Elements</b>	<b>The United States</b>	<b>Indonesia</b>
a. Ecological performance target	<ul style="list-style-type: none"> <li>• “No net loss” goal in mitigation policy</li> <li>• In site and off site compensation</li> <li>• Integrated or large scale of restoration efforts</li> </ul>	No specific ecological value goal as target in (ecological) compensation mechanism
b. Government regulation	<ul style="list-style-type: none"> <li>• Integrated and specific regulation on ecological compensation</li> <li>• Specific guidance on ecological compensation for some authorities involved such as Department of Transportation</li> </ul>	<ul style="list-style-type: none"> <li>• There are some regulations related to environmental policy such as EIA (<i>AMDAL</i>), forest protection, etc</li> <li>• Most of regulations are done by sectoral agencies (not integrated yet)</li> <li>• Less detail and unspecified regulations on ecological compensation</li> <li>• Weak political commitment to solve environmental problems → less enforced for violation to the regulations</li> </ul>
c. Coordination	<p>Through the establishment of specific institution like the Army Corps, to complete ecological compensation, it has encouraged to make partnership and coordination with :</p> <ul style="list-style-type: none"> <li>• Different government authorities</li> <li>• Private (bank sponsor) or conservation organization (land trust) to support ecological compensation</li> </ul>	<ul style="list-style-type: none"> <li>• The formation of committee for assessing environmental impacts procedure of project plans reflects coordination among different institutions and affected groups</li> <li>• Coordination with private or conservation organization in managing environmental impacts of road project is still limited</li> </ul>
d. Public participation	<ul style="list-style-type: none"> <li>• Public including poor community and minority population to actively involve in planning process and its implementation to reduce potential conflict since the early of the process</li> <li>• Community members are encouraged to direct involve in nature area management, for example through involving in land trust committee members</li> </ul>	<ul style="list-style-type: none"> <li>• There is an improvement of public participation mechanism to be used in all Indonesia’s planning process</li> <li>• It still a rare case that community members especially affected groups are participated directly in nature area management</li> </ul>
e. Dispute resolution	<ul style="list-style-type: none"> <li>• Dispute resolution can be made through the courts and out of the courts (i. e a third party formed by government or community)</li> <li>• The establishment of land trust for long term dispute in environmental management</li> <li>• Freedom of information act, the role of the courts, and legislative oversight for dispute between different government institutions</li> </ul>	<ul style="list-style-type: none"> <li>• Dispute resolution can be made through the courts and out of the courts (i. e a third party formed by government or community)</li> <li>• No such organization to manage dispute in environmental management for long term</li> <li>• There is a kind of dispute mechanism that is cultural embedded in Indonesia’s people</li> <li>• Limited access on information for public or other institutions lead to misunderstanding</li> </ul>
f. Independent oversight	<ul style="list-style-type: none"> <li>• It is established an institution to review or monitoring of mitigation actions which is done in proper way to ensure the implementation of project plans based on the regulations</li> <li>• Community especially affected groups and minority population are encouraged to make a review and self control in managing the environment</li> </ul>	<ul style="list-style-type: none"> <li>• Complex politics and bureaucracy system as the constraints</li> <li>• Less community or affected groups involvement in nature area management</li> </ul>

## 5.2 Possibility towards the implementation of socio-ecological compensation on road development in Indonesia

Based on the contextual condition of Indonesia, it may take the general assessment of the environmental performance and social issues related to the plan to implement ecological compensation in more socially sound. This assessment will be a basis for measuring starting points or where it should be started if ecological compensation is implemented in Indonesia. It is briefly described on table 5. 2.

Looking at the general assessment, socio-ecological compensation is still possible concept to be implemented in developing countries such as Indonesia. However, there are still needs some improvements in several aspects because of the limitation in experiencing of the concept. The assessment could be wrapped up into shorter pointers. Basically, political and public commitments on reducing environmental problem are the most important thing. These commitments may be indicated trough clear regulations managing ecological compensation rules and procedures by considering the social impact from the policy. Hence, public can be more aware on their responsibility and duty to actively take a role in responding environmental issues without loosing their right to continue their social life. These issues are related to institutional setting issues that should be considered as an important requirement for socio-ecological compensation implementation in Indonesia. The next section will discuss further of these issues.

**Table 5. 2 General assessment of Indonesia’s situation for possibility of ecological compensation implementation in Indonesia**

a. Ecological performance target	b. Government regulation	c. Coordination	d. Public Participation	e. Dispute resolution	f. Independent oversight
1. Sequence mitigation actions (+/-) 2. Clear environmental performance goal in practice (-) 3. <i>Constraints on landownership in site selection for compensation area</i> (+)	4. Detail and integrated direction for environmental performance (+/-) 5. Political and public commitment to environmental performance (-)	6. One competent leading agency in environmental performance (+/-) 7. Tripartite (government, private, and communities) coordination (+/-)	8. Citizen participation in planning process (+/-) 9. Role of community in nature area management (-)	10. Alternative out of the courts (+) 11. Freedom of information (-) 12. Role of the courts for conflict between government institutions (+/-)	13. <i>Complex politics and bureaucracy</i> (+) 14. Improvement of independent oversight mechanism (+/-)

Note: (+) : existed to be maintained or *reduced*; (+/-): available but not good/limited; (-) : not exist/weak condition

### **5.3 Major issues as lesson learned for the implementation of ecological compensation in Indonesia**

As developing countries, Indonesia must be having different conditions compared to US in responding environmental issues. The establishment of socio economic condition in most of developed countries like US has directed its development orientation to another issue other than economic such as on how environment can be sustainable for future. In contrast, Indonesia still concerns on how to increase economic level other than on the efforts on environmental management. However, it is still possible to adapt ecological compensation concept with some adjustment due to the social economic condition. This is supported by the increasing of public and government awareness on the efforts to reduce environmental impacts caused by projects without disproportioning societal context.

Based on the discussion on chapter 3, chapter 4, and the early discussion of chapter 5, it can take some issues as opportunities and constraints to implement ecological compensation in Indonesia. These issues become considerations in transferring ecological compensation policy to Indonesia. The main idea of this discussion is that the weakness or constraints of the existing environmental and social condition may be changed into opportunities through improving in some ways and adjusting the ecological compensation concept into the societal condition.

In general, from the US experience in ecological compensation, it can be taken a lesson that there are sequential efforts in the way to reduce environmental impact caused by projects plan such as road projects. Prevention and mitigation become the priority actions should be taken if a project is assessed to have impacts to environment. If it is still not working for reducing environmental impacts, ecological compensation may be another alternative. However, it has to be anticipated that ecological compensation in practice may has social implications afterwards.

In further explanations, based on the assessment of the six principles sustainable development and environmental justice principles discussed table 5. 2, there may be some general lessons to be learned from US as major issues for the implementation of ecological implementation in Indonesia in more socially sound.

1. First, specific and integrated directions and regulations on environmental performance that safeguard political commitment become important element

underlining the policy practice. This directions and regulation directs the mitigation actions sequence for achieving good environmental performance. The ‘avoid and minimize’ actions should be placed as priority as mitigation tools (Kolhoff, 2008, personal communication). However, if the impacts still remain, then ecological compensation effort will be another alternative that should be concerned to achieve ‘no net loss’. This sequence procedure will be as a targeted environmental performance for each institution involved in environmental management. However, the actions related to ecological compensation have to be determined not only based on environmental goal, but also on perpetuity social life consideration. Because in the implementation, it is not only has to deal with environmental interest, but also for social issues especially in Indonesia.

2. The second important element taken from US experience is the establishment of institutional setting managing environmental performance actions. It is established the specific institutions that have particular functions in managing ecological compensation since planning process, implementation and oversight. The leading specific institution is responsible to coordinate of institution related from the early step of assessment process to the implementation and monitoring of the realization. Moreover, there are also other specific institutions such as land trust and mitigation banks that have functions to help government or proponents to fulfil their responsibility to make compensation (ecological compensation implementation). These institutions may also offer some initiatives relating to social issues that have to be concerned in ecological compensation practice. Other than to encourage role of community in managing nature area, these institution also may be an alternative to support independent oversight of ecological compensation in practice. In short, the institutional matters highlighted here should accommodate the settings of coordination among stakeholders, participation, dispute resolution and independent oversight.
3. Public participation especially affected groups, low income and minority population involvement also become another element that can be learned from US experience. Each community member has a right to have equal position in decision making process. The involvement Indian tribe stated in environmental policy may indicate commitment of the government to take minority population to get involve in decision making process and implementation. It means that each community

members can express their interest to be concerned in planning process and also in the implementation of ecological compensation. The community members also have been encouraged to get more involve in nature area management. These matters may be tool for bridging environmental and social interest because of two ways communication is being initiated since the early of planning process and prolong in the implementation. Procedural and distributive fairness may be achieved in the implementation of environmental policy. In other words, environmental goals for future generation can be achieved without disproportionate social life for present generation through participation approach.

Possibility of ecological compensation to be implemented in Indonesia can be enhanced trough considering the strengths and weaknesses of the environmental and social condition existed. The strengths can be the positive points that should be maintained and developed. By taking some lesson from US experience with some adjustments, the present weaknesses may be improved for better implementation with some adjustments to the local characteristics.

#### **5.4 Potential of approaches for the implementation of ecological compensation on road development**

Because the concept of ecological compensation has not been fully integrated in Indonesian policy, it may be important to consider the approaches or instruments used in the implementation of ecological compensation. The six elements discussion in section 5.1 relates to “in-lieu-fee” arrangements (i. e land trust) and mitigation banking approach as third party alternatives in the implementation of ecological compensation. Other than permittee-responsible compensation approach, these third party approaches may offer simpler and cost effectiveness by also considering to social issues as explained in chapter 3. Proponents can just pay to those organizations to accomplish compensation for them. The approaches is used in US as a media for obtaining land as compensation area and for managing the area to be more useful and acceptable by local community.

In general, the institutional setting of “in-lieu-fee” arrangements represented by land trust and mitigation banking is managed separately with different approaches. Land trust as non profit organization accomplishes ecological compensation by protecting, enhancing and restoring nature land. Meanwhile mitigation bank is another institution



mostly as private firm that sell 'credit' of created, enhanced, and restored land to needy permittees to fulfil their responsibility to compensate of nature loss.

The assessment of the approaches (see table 5.3) are only a rough insights to give a brief views on what has been done in US. Perhaps, the experience of US will give some inspirations for the implementation of ecological compensation in more socially sound in Indonesia. However, it does not mean all of the US's experiences are good for Indonesia. It still needs some adjustments that have to be accorded to social-economic condition of Indonesian people. Moreover, these approaches are not fixed concepts for completing ecological compensation. There are some possibilities to modify the approaches or to create new ones which are more suitable with Indonesian socio-economic condition. The possible modification will be explained further in chapter 6.

**Table 5. 3 The general assessment of land trust and mitigation banking**

	<b>Strengths</b>	<b>Weaknesses</b>
Land trust	<ul style="list-style-type: none"> <li>• The cost of establishing an in-lieu fee program is usually less than the costs necessary for a mitigation bank to obtain approval by regulatory agencies, in part because most in-lieu fee programs do not require up-front capitalization prior to establishment (Scodari and Shabman 2000).</li> <li>• Most in-lieu fee programs are sponsored by non-profit organizations with natural resource conservation as a primary goal. These organizations have greater experience in identifying sites for ecological and environmental values as well as more experience and commitment to long-term management and stewardship than many other mitigation providers</li> <li>• Local in-lieu fee program sponsors may also have more intimate, long-standing knowledge of local resources, a long-term commitment to conservation in the region. Hence, it is more possible to <i>meet local needs</i> at providing mitigation options</li> </ul>	In-lieu fee programs typically do not initiate compensatory mitigation project until they have collected sufficient fees → time consuming
Mitigation banking	<ul style="list-style-type: none"> <li>• Sponsors of mitigation banks provide substantial financial resources to provide compensatory mitigation land, and then to obtain approval to sell credits to needy proponents</li> <li>• The sponsors must also plan and/or implement compensatory mitigation projects prior to selling those credits (Scodari and Shabman 2000). So, there is higher certainty that ecological compensation will be completed</li> </ul>	<ul style="list-style-type: none"> <li>• It is not clear yet that how mitigation banks can provide land as an area for ecological compensation</li> <li>• The common coordination is only between government institutions and proponents. The actors involved in Mitigation Banking Review Team (MBRT) only consist from the Corps, EPA, FWS, National Marine Fisheries Service (NMFS) and NRCS that has responsibility to make coordination with bank sponsor (private entities)</li> </ul>

### 5. 5 Concluding remarks

Overall, through analysing the contextual of Indonesian environmental and socio-economic condition, and combining lesson from US, it may issue brief conclusions.

1. *Government regulation* in national and local level is the most important element as a basic requirement for initiation process of ecological compensation in Indonesia. The clear regulation may influence the consistency of practice embedded in political commitment. Especially when it has to involve various institutions, the regulation

will be a basic reference for responsible authority to have guidelines and controlling tool on the actualization.

2. *Institutional settings* issues become another important element to be considered. The implementation of ecological compensation may not be completed if there is no certain institution arrangement managing the planning, implementation, and monitoring system. It is important to establish particular institution that has authority to make coordination environmental policy from national to local level in determining what appropriate approach or instruments to be used. The existence of particular instruments or approaches to support government efforts in ecological compensation may be also important. So, the institutional arrangement can enhance the effectiveness of ecological compensation in practice.
3. The effectiveness of institutional function in ecological compensation also can be supported by *public participation* (Walhi, 2004) so it can enhance *public acceptance* or *commitment* to environmental performance policy. Those are important element in adapting ecological compensation concept. Public acceptance may be reached if public are involved directly in decision making process and in managing compensation land. The decision taken is based on social preference and interests, and it is tighten up public commitment to accomplish the plan. Thus, other than to make environmental protection efforts establish, at the same time, the role of public or community can be more socially empowered, and at the end community members generate to make self regulation. In other words, to reach effective ecological compensation it should be environmentally and socially accepted. It should be noted that the final goal of this concept is how social-ecological compensation approach does not only give advantages to environmental protection efforts, but also to the whole social process such as 'real' participation accommodating poor people interest, empowerment, self regulation needed for better development by still considering to local condition.

By considering these three main issues, it may support the appropriate approaches that will be used for socio-ecological compensation practice in road development of Indonesia, whether in a land trust form, mitigation banking or others. Moreover, these three main issues will be the basis for the recommendation that will be discussed on the next chapter. The next chapter also is become the end of this study by enclosing it with the conclusion of the discussion of ecological compensation concept.

## **CHAPTER 6**

### **CONCLUSION AND RECOMENDATION**

This chapter is the final part of the research discussing the possibility of socio-ecological compensation implementation in Indonesia by taking some lessons from US experience to be adjusted to contextual condition. Some final conclusions based on the discussion in previous chapters will be elaborated in this chapter. At the end, some recommendations also will be given as considerations for the implementation for ecological compensation in more socially sound in Indonesia.

#### **6.1 Conclusion**

At this section, it will put some conclusions based on the discussion in previous chapters by relating to research questions of this research. The conclusion will be structured to answer those questions consisting of:

1. How is ecological compensation carried out in road development planning and what are social issues related to it?
2. How is the ecological compensation implemented in US, and what are strategies taken there for the implementation with its relevancy to potential conflict between ecological and social issues?
3. What lessons can be learned from the United States experiences for the implementation in Indonesia, especially for the more socially sound implementation?

#### **➤ The implementation of ecological compensation in road development and social issues related**

On one side road development is important to support economic growth of regions, but on the other side it is inevitable that it has significant potential to cause negative impacts to environment. The ‘environment’ termed here includes natural and human environment such as health, social welfare, etc. Realizing the negative impacts to environment caused by road development raise some environmental directions in order to reduce the impacts. Through EIA procedure, the road projects have to be assessed environmentally whether those projects cause important and substantial impacts to environment. The EIA committee (i. e in US procedure) propose some

alternatives in sequence to reduce the impacts started from *prevention, mitigation*, and finally *compensation* for unavoidable impacts. So, ecological compensation is not necessarily become the first option. In deciding what action should be taken, other than use environmental consideration, there is also social justice consideration, especially on affected communities and minority population.

In general, those sequences have different approaches. Prevention and migration are actions that mostly use technical measures as tools to help reducing the environmental impacts such as fauna tunnel, noise barriers, ecoduct, etc. Meanwhile, compensation of nature land, as main focus of this thesis, allocates land to be created, enhanced or restored to have ecological targeted value. Based on 'no net loss' principle, the nature area that has been cut for road construction has to be compensated in another place by using in site or off site compensation approach.

However, in ecological compensation practice, it has to deal with land availability which has potential to cause social implications. In some practices, there will be potential actions to make some conversion of land use to be allocated as compensation area, for example from agriculture or housing to nature area. The function of area will be different and people who use that area will be suffered, and here the social implications caused by ecological compensation are occurred. In other words, there is a potential conflict between environmental and social interests or ecocentric views and anthropocentric views. Whereas, according to sustainability principle, environmental and social elements are linked together. Hence, social impacts should be taken into account of ecological compensation implementation.

➤ **Ecological compensation for road development in US and alternative strategies in the implementation**

The sequence actions for environmental performance like avoid, minimize, and compensatory mitigation are stressed as important condition for any development activities in US and it is established at national scale regulation. The regulations give specific guidelines to accomplish the environmental performance supported by established institutional setting from the planning, implementation, to monitoring mechanism.

Compensatory mitigation is the last option of mitigation sequence action due to unavoidable environmental impact that may still remain. By focusing to achieve 'no net

loss' and 'net gain' principle, projects using significant acreage of nature land in US, such as road development, oblige to compensate the nature land taken with certain of ratio. This action indicates **the political will and commitment (1)** of the government to safeguard environmental quality for the future.

During planning process of environmental performance, **participation (2)** becomes an important element that has been taken into account since in EIA process. In determining the approach of mitigation measurement, affected groups, minority population and poor community are involved to decide what instrument taken for reducing environmental impacts. Participation is also generated when compensation project is implemented. Community members especially affected groups are empowered to take parts in nature area management after the implementation. By sharing land use using easement approach, they can utilize their land for earning money, and at the same time, they can also participate in nature preservation.

**Intergovernmental institutions coordination (3)** together with private (bank sponsors) and conservation organization is another important element performed in the implementation of ecological compensation in US. Coordinated by one competent leading agency like the Army Corps, the agency manages and directs the other government institutions and community organizations to accomplish compensation acts in their project plans as established in regulations.

To implement ecological compensation in US, it has been developed **different approaches (4)**. Other than compensation done by permittees, there are also other alternatives using third party organizations such as 'in lieu fee' arrangement (i. e land trust) and mitigation banking. These third parties are developed for completing ecological compensation to reduce limitations compensation done by permittees. Permittees give funds or money to land trust or mitigation banks after the project permit is issued by the Army Corps as leading agency in EIA process. By using third party organizations, it is more possible to make compensation area in larger scale so it will be more efficient in managing the land and achieving targeted ecological value. Moreover, these approaches also offer simpler way in cost and time for permittees in order to complete their responsibility on environmental performance as it is targeted in permit document, and on the other hand the project still can be continued.

By reviewing these approaches, land trust and mitigation banks may offer some advantages for achieving environmental performance goal like no net loss in more socially sound. The approaches used in these instruments consider both elements, environmental and social values. The position of these approaches is established in national environmental policy for mitigation and compensation. To achieve 'no net loss' goal, coordination among government institutions, private and communities members or affected groups are created to determine what appropriate instrument used for compensation. The affected groups also may be involved in decision making process and nature area management after ecological compensation is implemented. The coordination and participation are made in these mechanism may reduce dispute or conflict of interest between ecological and social views since the early of process of environmental actions. Independent oversight of ecological compensation implementation is also possible to be performed by these organizations, because these third organizations are separated from government system that full of bureaucracy and highly political influenced. However, there are also some limitations. The dependency on funds from donors or sponsors and human resources (expertises) may cause the extension of time for completing ecological compensation by these third organizations.

Furthermore, in post implementation, other than the third organization it self, the government institutions also involve in **oversight mechanism (5)** by forming a specific committee to evaluate mitigation and compensation in practice. The committee also evaluate the performance of institution that has conducted compensation. Hence, here the government still has the highest institution to make overall oversight.

Related to environmental justice issue, nevertheless, the implementation of ecological compensation in US still has to face the challenge. The regulations of ecological compensation have not fully safeguarded socioeconomic distributive justice. It is because the regulations only emphasize on the enlargement of nature area to reach in certain level in hectares (quantitative measures), but it has not yet covered the distribution of social benefit.

The improvement in institutional setting the ecological compensation may be the important thing. The collaboration between two different private land trust, conservation and community land trust, may offer better solution for environmental acts and community-based development at the same time. Hence, the potential conflict

between ecocentric and anthropocentric may be reduced. The further explanation about this will be discussed in section 6. 2.

➤ **Lessons from US and possibility socio-ecological compensation for road development in Indonesia**

The US's experience in ecological compensation may be taken as an example to give some perspectives for the implementation in Indonesia. The implementation of environmental performance, especially ecological compensation in US is supported by some factors.

- 1) The specific and integrated directions stated in national scale regulations become main guidelines for actors involved in ecological compensation to safeguard environmental performance.
- 2) Institutional setting managing environmental performance is another important issue to be learned. There is sharing responsibility and coordination among government institutions lead by competent leading agencies. The Army Corps of Engineers is responsible for managing permit procedure through EIA process, meanwhile the Committee on Mitigating Wetland Losses responsible for evaluating environmental performance mitigation actions and also the institutions conducting the compensation projects. The position of committee is separated from the corps or other government institutions. Hence, it may lead to independency on the process and output of the compensation report. The independency is important for achieving accountability in governance as one of elements for environmentally and socially sustainability. .

For the implementation of ecological implementation, there are also particular institutional mechanisms providing alternatives. Other than compensation conducted by permittees, land trust organization and mitigation banking are two alternative approaches to implement ecological compensation that may offer advantages for accommodating environmentally and socially interests.

However, there are some strengths and weaknesses on land trust and mitigation banks. The limited financial capacity owned land trust organization and its dependency on permittees funds sometimes become a constraint for ecological compensation implementation in advance. On the other hand, land trust may provide more certainty for completing ecological compensation in more socially sound



leading to environmentally and socially sustainable goal. This organization may provide long term nature area management and state natural resource conservation as the primary goal in their organizational mission. Moreover, these kinds of organizations also have significant experience working with diverse groups of agencies and organizations in a collaborative manner. So the compensation options may meet local needs.

Compared to mitigation banks approach, the financial guarantee provided by private sponsors make compensation can be fulfilled in advance. Private sponsors also may provide long time assurances needed for long term nature area management. However, it is not clear yet how mitigation banks complete ecological compensation. Moreover, even though there is possibility for public to make a review on banks proposal, but most of coordination made only between government and private. It can be seen from MBRT members that only consist of government institutions and sponsors.

Considering these strengths and limitations especially to deal with social problems, the establishment of new institutional setting may be needed for the implementation of ecological compensation in Indonesia. The social problems founded in Indonesia certainly more complex than US. Hence, it needs an institutional setting to accomplish ecological compensation in environmental and socially way.

- 3) For reducing potential conflict of interest between ecocentric and anthropocentric, public participation is performed since the early stage of planning. Related to environmental justice, the community members including low income people, minority population, and ethnic tribes have equal position to take a part in decision making process, in nature area management, and in monitoring the actions. By encouraging those people to participate, it may be a reconcile way for environmental and social interest resulting for agreement based on common understanding. Hence, at the end environmental performance goal still can be achieved without causing disadvantages for people's life.

In Indonesia, ecological compensation can be defined as a premature concept meaning that the concept has not been fully recognized and developed in the environmental and road policy. However, the lessons from US to Indonesia practice are

not necessarily to be adapted as a whole for Indonesia. Related to more complex social structure and problems in Indonesia, the transfer process has to be responded by adjusting the concept of ecological compensation regarding to local contextual condition. The contextual differences between US and Indonesia such as political and social environment, and cultural values in landownership may lead to the differences of the approach used for the same ecological compensation concept. Through the assessment on existing condition in Indonesia, it can be measured the strengths and weaknesses as starting points for further implementation.

From the existing of environment and social Indonesian condition, there are some issues can be assessed as **positive points** for supporting the implementation of ecological compensation. (1) *Public awareness* on the importance of environmental function protection encourages people to actively involve in some actions related to environmental issues. Moreover, this awareness is supported by some (2) *existing environmental regulations* as an ‘umbrella’ for projects plan to be more environmental friendly. The intensification of (3) *public participation* in planning process that has been initiated also becomes important issue that may support the implementation of ecological compensation in more socially sound.

However there are still some **weaknesses** points that still need to be improved. Even though there are some environmental regulations, but there is (1) *no specific and integrated regulation yet* guiding environmental performance in practice. This condition may cause misinterpretation of environmental policy by different government institutions. Moreover, the government institutions seem ignore environmental consideration on their project because of uncertainty in regulation and enforcement. Hence, the (2) *environmental actions tend to be a sectorally performed*, only by environmental institutions, while the other government institutions such as Transportation Department apparently do not concern yet about environmental matters.

The other institutional issues such as limited coordination among different government institutions, and between Indonesian government and community-based environmental organizations may lead to inefficiency in achieving targeted environmental value. Specifically to ecological compensation issues, (3) *lack of public participation in nature area management* and (4) *no established organization managing ecological compensation* are other concerns to be improved. Nevertheless, these points may important in order to accommodate social interests in environmental performance.

Taking to more detail in social issues in Indonesia, landownership is a crucial issue that has to deal in the implementation of ecological compensation. Landownership issue may affect the process for obtaining land as compensation area and also for managing after the compensation. The cultural value embedded on land may cause difficulties for land purchasing process to be allocated as compensation area. It also affects the sharing responsibility in managing land after compensation whether by government, conservation organization or community members it self.

However, it may be concluded that ecological compensation concept is still realistic to be implemented in Indonesia. However, it takes time to make it established and there are some important condition in bridging ecological view and social interests. The establishment of specific regulation on sequence environmental performance, specific institution with certain responsibility, and public participation that really represent affected people and low income, may be the crucial factors for the implementation of socio-ecological compensation in Indonesia. The more practical improvements that may be needed will be explained in the recommendation section (see section 6. 2)

## **6. 2 Recommendations**

At the end of this chapter, some recommendations can be provided for the implementation of ecological compensation in Indonesia. These recommendations try to give some insights what practical actions should be provided for efficient implementation to reach environmental goal without disproportionate social being. The practical recommendations include the requirements and the mechanism or approach should be taken if it is implemented.

When environmental performance has been ignored as important issues, it should be realized that there is still potential risks to have natural resources loss due to the intensification of economic activities. Due to population growth and economic development, further conversion and disturbance of natural habitat is probably inevitable. Hence, it is important to start concerning environmental performance in development practice. When environmental impacts can not be fully avoided, there should be a mechanism to prevent and reduce the impacts. The sequence or hierarchy of environmental performance: prevention, mitigation, and compensation may counteract the effects of development by protecting, restoring and enhancing natural ecosystems.

However, there are still particular conditions to be created for the implementation of those actions.

Due to political system and socio-economic condition in Indonesia, the environmental performance concept may not easy to be implemented. Institutional and regulation weaknesses, limited nation's technological abilities, complex political and bureaucracy system, and economic resources may influence the policy transfer process to the environmental system of Indonesia. According to Boyle (1998), developing countries may have much more difficult challenges to perform some actions to address environmental problems. It is not only because of powerful development interest but also because of limited political resources. Moreover, the social issues related, such as poverty, illiteracy and especially cultural embedded on land in the process of land acquisition and land management after compensation, also become important issues as obstacles faced by the government.

Hence, there still need some improvements to cover up the recent weaknesses. Taking lesson from US experiences there are three main elements to be improved in political and environmental planning system of Indonesia which are: (1) government environmental regulation; (2) institutional setting; and (3) participation; without putting behind ecological targeted value that also has to be considered.

### **1. Developing government regulation of environmental performance**

Regulation is a basic thing for the establishment of a policy to be enforced for all actors involved. It becomes main element for developing environmental performance implementation showing political support, especially for ecological compensation practice in Indonesia. However, the existing environmental regulations in Indonesia has not fully concerned yet on ecological compensation. Even though there are some regulations supporting environmental performance, there is no specific and integrated regulation yet stating environmental performance sequence and compensation as a part of the sequence. Moreover, the content of environmental regulations seem still become sectoral responsibility having less support from other sectors.

In fact, the transfer process of ecological compensation concept is easier if there is supporting regulations *stating specifically on the concept and the requirements*. The regulations should include clear statement on both sustainable development and environmental justice principles. It means that the regulations do not only cover

ecocentric view, but also anthropocentric interests that link to community. Moreover, the regulations also *provide a framework* and an *enforcement tool* for all government agencies to consider environmental performance as a part of EIA study in their project plans. So, environmental performance is not only an obligatory for environmental agencies, but also for other sectors such as transportation. In other words, the regulations should bind all government authorities in different levels of government.

Because ecological compensation is a rather new concept in Indonesia, the *specific requirements* stated in regulations will support the implementation of socio-ecological compensation. The requirements may involve environmental scientific and social approach. One of important requirement is the availability of land. However, there are some considerations in site or land selection findings to achieve ecological targeted values. According to Minkin and Ladd (2003) in Department of Army (2008), the location of a compensation projects is important to for functional replacement to develop the land to have ecological targeted value. The ecological compensation location has to consider to natural characteristics of land such as reliable and predictable sources of hydrology (NJDEP, 2002 in Department of Army, 2008), ecosystem service function, and landscape position for self-sustaining achievement. The better procedure in site selection may lead to effectiveness of ecological compensation (Minkin and Ladd, 2003 in Department of Army, 2008).

However, the impact of ecological compensation to community (social impacts) also should be considered in the analysis of site selection. The community groups affected by road development should have priority to get compensation and may be prevented from another implication such as unworthy resettlement resulted from the compensation policy.

The “watershed approach” is recommended as prominent consideration for selecting site as compensation area based on US experience. By using the approach, the compensation area location is determined based on the nature relationship between compensated and new compensation area. It has to be prioritized that ‘in site compensation’ comes first. It means that the location on compensation area is adjacent or maximum 1 – 2 km from destructed area (Cuperus, 2008, personal communication). This approach may become a potential mechanism for giving benefit for community especially for affected groups. By using this approach, it may be ensured that people

who get disadvantages will be compensated because the destructed area and the compensated area are in the same or nearby location.

However, another option, called ‘off-site compensation’, can be another alternative if ‘in site compensation’ is difficult to make. Moreover, the size of compensation area also has to be calculated considering the environmental values that intend to be replaced. Taking US experience, the ratio between compensated area (disturbed area) and new nature area becomes reference for determining the size of compensation area. It may be important to make the ratio as high as possible. Besides it will be better solution for achieving targeted ecological value, the higher ratio also may lead to prioritizing of ‘avoid and mitigation’ measures are put in the first place, other than compensation. This lesson may be important to be highlighted for stimulating the actualization of the ‘hierarchy’ of environmental performance and reducing potential conflict between environmental and social interests. These requirements should be regulated in compensation mechanism.

As mentioned before, besides the relation site selection and ecological targeted value, site selection also relates to equity issues for affected groups. Hence, overall conclusion, site selection process in ecological compensation for road plan should consider both elements: ecological targeted values and communities that will be affected by ecological compensation. The best location is the location that does not have or have less potential to cause social conflict with local communities and landowner, but it has potential ecological value that can be enhanced. However, in some circumstances, there is still a possibility of trade off between community interests and the achievement of the quality of compensation. Hence, in this case, the strict regulation may be needed to be enforced for environmental interest (Cuperus, 2008, personal communication).

Moreover, the improvement planning process between road plan and environmental planning should be enhanced. As discussed in chapter 5, *the integration between environmental performance policy and other regulations* is another important element to be improved to build a base for the implementation of ecological compensation, especially in road sector. The development integrated policy or regulation between transportation and environmental performance can be a start point to implement ecological compensation in road development. The EIA procedure should state specifically the sequence of environmental performance as alternative efforts for

reducing environmental impacts. Then, the EIA procedure should take into account in planning process as a main requirement for road permit system. In short, the environmental performance should be explicitly stated in road plan document.

Moreover, the integration between transportation planning and spatial planning related to compensation plan also important to be considered. It is based on the consideration that all activities that have consequence on landscape changes should be planned in spatially properness. The process of site selection for ecological compensation in road plan must be deal with the considerations on hydrology, landscape characteristics and land-use plan as a part of spatial characteristics.

## **2. Improvement in institutional setting**

According to Amron (2007), there are some institutional problems that has to be faced by the government of Indonesia in implementing particular environmental policy. Those problems are related to

- (1) Lack of coordination in environmental policy and programme formulation, investment planning, and impacts controlling mechanism.
- (2) The limitation of institution capacity

Hence, the improvement in institutional setting especially for ecological compensation performance is an important element that should be considered. It relates to possible institutional arrangement for realizing ecological compensation in Indonesia associating with contextual social condition. It may be regulate sharing responsibility among government institutions, specific institution regulating environmental performance implementation, actors involved and the form of coordination needed for the implementation of ecological compensation in more socially sound. Here, some recommendations proposed for the improvement of institutional setting towards socio-ecological implementation in Indonesia:

1. Improvement coordination among actors involved
2. Strengthening environmental agencies
3. Improvement institutional capacity for realizing ecological compensation in socially sound
4. Improvement oversight mechanism

### ***2.1.Improvement coordination among actors involved***

As explained in chapter 5, one of weaknesses in Indonesia institutional setting related issues is lack of *coordination* among government institutions and others actor involved such as non governmental organizations and private entities. According to Boyle (2003) in general for effective environmental performance, the coordination and corporation among environmental and other sectoral government agencies support the effectiveness of environmental actions. Furthermore, related to contextual condition in Indonesia, Boyle (1998) argue that because of lack of coordination in making EIA reports with other departments that responsible for location, nuisance control, etc, it causes no formal authority for environmental agencies to collaborate to accomplish avoid or minimize actions for environmental impacts during project design.

The existing of specific environmental institution such as BAPPEDAL at national scale should be more empowered that has authority to enforce environmental violation. The same authority is also given local environmental agencies at local level. This specific institution has roles as regulator, facilitator and control for ecological compensation in practice. Coordination between this institution and others such as transportation department should be initiated since the early process of project permit, and it is maintained until the implementation.

The coordination and partnership is important to share information, to integrate environmental performance alternative into project plans, to scope and evaluate the environmental planning and assessment effort, and to implement the environmental recommendations. Therefore, it may be needed to *enhance the awareness among government institutions that environmental problems cannot be resolved only by one institution by intensifying coordination and partnership*. Relating to contextual condition in Indonesia, the working-level communication, coordination, and cooperation among ministries, and even among departments within the same ministry, is required for effective environmental management and implementation of environmental performance sequence (Boyle, 2003).

### ***2.2.Strengthening environmental agencies***

The implementation of new concept such as ecological compensation as a part of environmental performance must need a competent leading agency as the highest level in coordinating and managing of the performance. Looking at recent institution in



Indonesia, environmental agencies still has limited authority to require EIA studies and almost no ability to enforce EIA result (Boyle, 1998). Hence, the role and position of existing environmental agencies should be strengthened in authority and legally stated. There are some possibilities to strengthen the role and position of existing environmental agencies for ecological compensation implementation:

- *One competent leading agency* should be established to make a plan, develop environmental performance instrument and specific environmental performance target and indicator to be practiced by other related institutions, and also build up oversight or monitoring mechanism. Looking at the potential institution in Indonesia, the position of BAPPEDAL which is has authority in environmental impact assessment procedure at national scale still needs to be enhanced. The institution should not be concerned as administrative institution that only has administratively function, but it suppose to has controlling function. The institution should not only accept the report from proponents, but also has to make check and balance observation, and can make some enforcement actions for environmental violation. So, at the end, the institution can be a reliable institution because of its consistency to keep the responsibility.
- Moreover, *the position of environmental agencies* should be brought *at strategic level*. It means that the input from the agencies really can influence the decision taken for development action, and can make some enforcement actions. One way that can do to achieve this is by integrating some environmental directorates that recently are positioned at different departments. According to Salim (2004), the integration between Spatial Planning Directorate (Public Works Department), Forestry Protection and Nature Preservation Directorate (Forestry Department), and BAPPEDAL at Ministry of Environment may enhance effectiveness environmental performance. The establishment of new corporate among government institution, especially for environmental performance like the Army Corps in US, is recommended for the establishment of socio-ecological compensation in Indonesia.

### ***2.3.Improvement institutional capacity for realizing ecological compensation***

The implementation of ecological compensation ultimately needs a particular institution or mechanism that may guarantee the properness concept in practice. The main goal of this institution is to make the better and effective institution for ecological

compensation to achieve sustainability on both environmental and social. The institution does not only accommodate environmental, but also social interests in environmental performance management. The intended institution may be resulted from the institution representing locally acceptable arrangement in managing natural resources. The improvement of existing institutional setting in Indonesia into more environmentally and socially sustainable may be needed towards socio-ecological compensation implementation. The appropriate institutional arrangement for the implementation of ecological compensation may be resulted from the collaboration between different approaches that at present those seem separately operated.

Taking experience from US, third party organizations management such as land trust and mitigation banks can be preferable alternatives for completing ecological compensation, other than only by proponents' initiatives. However, as explained in table 5. 4 about the assessment these third party alternatives, there may be better if there is a *collaboration between land trust and mitigation banks*. The collaboration may lead to effectiveness of ecological compensation implementation in more socially sound.

*The collaboration is possible to make between conservation land trust and community land trust.* Taking one of experiences in US, the collaboration between these separated land trusts may provide the successfully of land conservation and affordable housing at the same time by community-based management (Campbell and Salus, 2003). By this collaboration, the land trusts can get access to financial resources for conservation and houses funding. So the organizations can get more funds to complete ecological compensation and affordable housing in one step. Another advantage is the land for compensation can be obtained at lower price because of prices mechanism provided by community land trust. Moreover, the easement approach in landownership provided by conservation land trust restricts the use of the land, hence can protect the increasing or land price at the same time. The restriction in easement approach is related to the limited improvements can be made on land and houses, so the re-sale prices can be maintained. This approach may be suitable to reduce potential social conflict between environmental and social interest due to Indonesia's condition that has complex social structure and landownership.

However, these forms of collaborations are not fixed concept. The lessons from land trust and mitigation banks approach may provide some insights for formal institution supporting the establishment of locally institution towards socio-ecological

compensation implementation in Indonesia. However, it may be needed some adjustment to be accommodated in the social environment of Indonesia. Those formal institutions may be combined to *informal institution that cultural embedded* to the communities in Indonesia for ecological compensation to be more acceptable. These institutions should represent ‘a compromise between social acceptability and appropriateness and resource management effectiveness’ (Lewins, 2007). Hence, through the new institution formed combining formal and informal institution can be a tool for decision making mechanism and dispute resolution in nature area management.

Looking at financial compensation mechanism as the common practice in Indonesia, a kind of mitigation banks can be utilized for ecological compensation of road development in Indonesia. Present condition indicates that financial compensation given by proponents to the government is taken as revenue for national tax system. However, it cannot be ensured that the money will be allocated for environmental purposes. Therefore, it might be better if the money is collected in particular organization or mitigation banks-like which is controlled by government and public, then the money can be used for ecological compensation purposes. At the end, the magnitude of environmental destruction caused by road projects can be reduced, while economic activities such as road development still can be completed.

To complete socio-ecological compensation in Indonesia, the new form of mitigation banking-like could be joined with land trust-like organization. The money collected by mitigation banks may be used for purchasing land as compensation area, and creating the land to have targeted ecological values without disproportionate social life surroundings. The easement approach (see in chapter 3) in land trust may be used in bridging ecological and social interests.

### ***2.3.1. Institutional setting for ecological compensation in environmental justice perspective***

Another issue that should be accommodated in institutional setting for ecological compensation in socially sound is *how to accommodate poor people’ interest* that may be affected after ecological compensation is implemented. Actually, informal institution can be a tool for facilitating their interests on nature area management. The collaboration between formal and informal institution as explained above may be an alternative to accommodate poor people’s interest. Moreover, according to Lewins

(2007), there are four important sequential elements for better institutional setting in nature resource management with pro-poor mechanism: collective support, facilitation, equitable benefits, and consensus (see table 6. 1). This institution is designed by considering the allocation of new rights, responsibilities and powers, the approach to participation on intended beneficiaries by associating with the existing institution (formal i. e law and informal i. e social mechanism).

**Table 6. 1 An idealized institution of inclusive and pro-poor nature resource management**

<b>Idealised project stage</b>	<b>Potential strategies</b>
1. Collective support	Cost-effectiveness for participants and broad beneficiary range
2. Facilitation	<ul style="list-style-type: none"> <li>- Roles for pre-existing project structures (user committees, etc.) and consolidate project structure to local government</li> <li>- Selecting of local NGO partners</li> <li>- Training of local level staff such as community organisation</li> </ul>
3. Equitable benefits	<ul style="list-style-type: none"> <li>- Ensure early inclusive planning</li> <li>- Increase facilitator awareness of power issues and 'processes'</li> <li>- Reduced geographic coverage (smaller participant clusters)</li> <li>- Working with pre-existing informal institutions</li> <li>- Change from sectoral to livelihoods focus</li> <li>- Link technical service provision to a rights-based approach</li> </ul>
4. Consensus	<ul style="list-style-type: none"> <li>- Early use of participatory planning and consensus building</li> <li>- Dispute-resolution as an integral function of project structures</li> </ul>

*Source : Lewins (2007)*

This research result could be a reference for establishing institutional setting for ecological compensation in Indonesia that more suitable with societal context.

Looking at societal condition of Indonesian people in which many of them earn money from natural resources, it can be an opportunity to more encourage local communities in managing nature area management after compensation (*civic engagement*). Civic engagement is one of elements to perform environmental justice in practice. Besides, it can be a tool to improve public participation in addressing environmental problems, local communities also can continue their life without losing their jobs. For example, by developing compensation area into natural tourism area, local communities can work as an employee in the management of the area. Another alternative is by using easement approach. It means that a part of land can be utilized as nature area with some restrictions to develop the area to another land use. On the other hand, the local communities and landowner still can take natural resources for

continuing their life. By such mechanism, self-regulation or self-awareness of Indonesian people to environmental matters may not only imagination to be performed.

#### ***2.4.Improvement oversight mechanism***

Oversight mechanism is another important element in the institutional setting for socio-ecological compensation in Indonesia's practice. The mechanism shapes a form of monitoring by public in which public has an access to have information on the practice and give comment and participate to control the process. Hence, public is not only be an object, but also be a subject of the practice.

However, there are still some weaknesses on environmental institutions in Indonesia that have responsibility in controlling function to environmental impacts. It is apparently that the institutions are armless to make proper controlling system and lack of capacity to make some enforcement actions if there is a deviation in environmental performance. Hence, it needs an improvement of institution to have better control function to prevent the magnitude of environmental impacts.

There are three possible ways to improve controlling function of government institution.

- The existing environmental institution and regulations has to be improved to become enforceable tool for environmental violation.
- If it is needed, the establishment of new institution may be another alternative to make controlling function better. Taking an example from US experience, controlling function of government institution in ecological compensation is strengthened by establishing specific institution that has responsibility to monitor and evaluate the environmental performance.
- Developing appropriate indicators for monitoring the implementation of environmental performance especially ecological compensation

It also should develop an a-politic institutional setting that has role in oversight or controlling mechanism of environmental performance implementation. It means that to control proponent to accomplish environmental performance in proper way, it should not political power can influence the oversight result. Other than can be supported by government institution, independent oversight also can be initiated by involving in the environmental planning mechanism. Community-based oversight also may give

advantage as instrument for community empowerment in environmental management. Role of informal community institution triggered by religious people or other influenced people can be enhanced, so the oversight can be performed from the lowest level of community or affected groups and more independent.

### **3. Improvement public participation mechanism for poor people or affected groups in EIA process and the implementation of socio-ecological compensation**

In line with sustainable development and environmental justice principles, equal position of all community members to participate in decision making process and environmental management after implementation becomes main element to be highlighted. Through participation mechanism in interactive way, local communities are encouraged to able to identify their environmental problems and to figure out the possible solution to address them. The principles and practice of public participation can serve to promote environmental equity for disadvantaged social groups (Hampton, 1999). By building interactively building supported by locally common understanding, the potential conflict between stakeholders with different interests and the uneven power relations among them may be reduced since the early of the process.

Looking at social condition in Indonesia, actually participation has been initiated by government and local communities in regulatory and practically. Planning process is become a part of communities' concern because they are one of actors involved within the process. Moreover, there is a kind of consensus mechanism (*musyawarah* for *mufakat*) that culturally embedded in Indonesian society as an alternative for social dispute resolution at community level. However, the participation practice often involve people who has 'power' in money and access to information or education only, not for poor people. The environmental justice principles have not been fully reflected in Indonesia practically.

To accommodate poor interest in planning process in general, specifically in environmental performance, is not easy task. Hence, it may be needed an *advocacy mechanism* by government institution or NGO to facilitate poor people interest in decision making process. Since the earliest stages, it should involve a *reliable spokesman appointed* for negotiation and consultation on behalf poor community (Kolhoff, 2008, personal communication). Moreover, locally consensus mechanism also

should be maintained and enhanced. It is because the effectiveness participation practices in preventing and reducing environmental inequity can be supported by cultural and social needs of social groups (Hampton, 1999).

### **6. 2 . 1 Possible application of socio-ecological compensation in Indonesia's road planning practice**

All the recommendations elaborated in previous sections may support the implementation of socio-ecological compensation in planning context of Indonesia. In this section, the concept of socio-ecological compensation will be correlated in clearer way to Indonesia's regulation and institutional condition such as spatial planning, actors involved, participation approach (see figure 5. 1).

Every activity or project on the ground leads to changes on the landscape. Hence, road development planning correlates with the spatial planning indeed. Site selection process for road project may be one of important examples to describe the correlation that has to consider to environmental and social impacts. Actually, this correlation has become main reference for road development planning to be based on the spatial planning, as explained in chapter 4. However, the deviation in the implementation may still be an issue to be concerned.

The same idea will be applied if ecological compensation is implemented in Indonesia. The implementation of socio-ecological compensation must be deal with location issue that has correlation with spatial planning. The site selection for compensation area must be related to road plan and spatial planning at the same time. To be correlated with planning practice of Indonesia, there may be two important stages in the application of socio-ecological compensation:

#### **1. Project Planning**

At the planning stage or road project, coordination among governmental institutions such as Transportation Department (Public Works Department), Environmental Agencies (Bappedal), Planning Board (Bappeda/Bappenas) and others may be important indeed for bridging ecology and social interest. Then, the road plan is socially and environmentally assessed through EIA or AMDAL. During the analysis, potential social and environmental implications may be important aspects to be concerned followed by public involvement in the process. By giving information about the plan to public and considering about impact to affected

groups in determining the best mitigation measure, it is expected that the road plan process may be more socially sound. If ecological compensation may be taken as an action, it also should be based on social and environmental considerations due to potential social implications may be resulted from the compensation.

## 2. Implementation

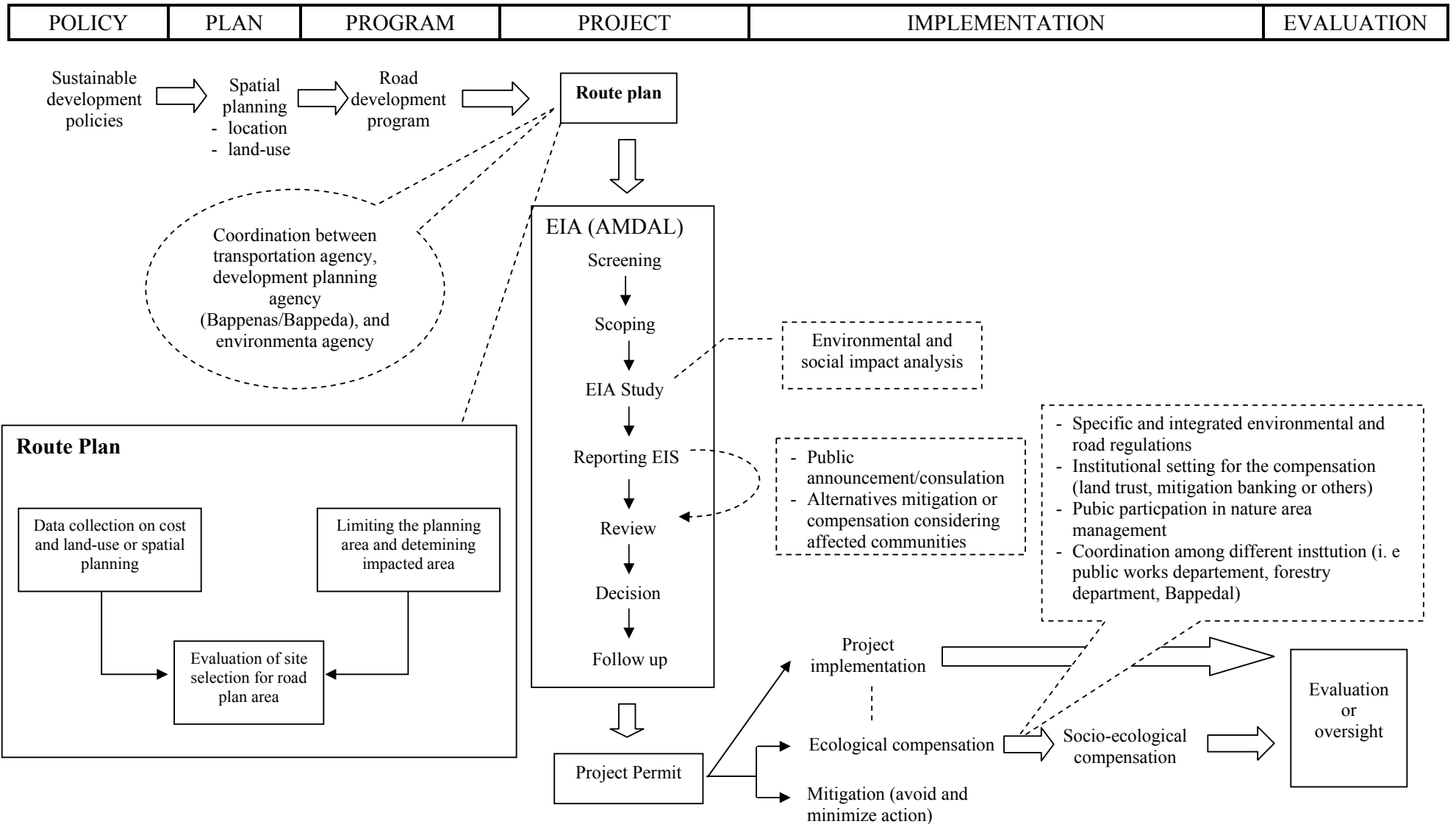
The implementation of ecological compensation may be performed in parallel with the implementation of permitted road project. Towards socio-ecological compensation, there may be several points that should be considered:

- Specific and integrated environmental and road regulations
- Institutional setting for the compensation (land trust, mitigation banking or others)
- Public participation in nature area management
- Coordination among different institution (i. e public works department, forestry department, Bappedal)

In addition to, the evaluation or oversight may be an important step to be taken to ensure that the targeted ecological value will be achieved without disproportionate social life on affected communities.

The next chapter will be discussed the conclusion and recommendations given based on the main issues elaborated in previous chapters. Those may be support to give more practical approach for further action for the implementation of ecological compensation in more socially sound.





**Table 6. 1 The application of socio-ecological compensation concept in Indonesia’s road planning practice**

## **Epilogue**

Finally, it can be concluded that even though ecological compensation concept is rather new for Indonesia's environmental and road development institution, it is still possible to implement the concept through some improvements in the regulatory framework and institutions settings. However, it is realized that this research only discuss a small part of the whole of problems. Even though it has been done some interviews to support secondary data (literature review), there are still limitations in interpreting data and information. Consequently, the result of this research may not answer the whole problem in environmental performance, especially in ecological compensation for road development. It still need some further researches discussing the issues towards better policy practice in environmental and road development such as ecological compensation associating with contextual social issues considerations.

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## APPENDIX I. ISSUES DISCUSSED DURING THE INTERVIEWS

One of the main sources of information for this report was a series of semi-structured interviews (face to face interviews) with two experts who have worked on issues related to environmental performance and ecological compensation.

A general list of questions – rather than a formal questionnaire – was prepared as the basis for the interviews. Each interview followed a continuously discussion related to their experiences and interest of the interviewee.

### 1. THE INTERVIEW WITH RUUD CUPERUS

He works at Rijkswaterstaat (State Water Board) Utrecht, Department of Planning and Advice (WFP) - Cluster Head Knowledge (WVPK). The interview had been done on June 9, 2008.

The interviews were guided by the following questions and issues:

**a. *Related to possibility environmental impacts caused by projects, how are road projects assessed?***

Projects are assessed through EIA procedure. The EIA committee or other authorized agencies i. e Ministry of Transport propose the alternatives to reduce the impact: avoid, minimize, and compensation. If there is no appeal in the court, the decision or permit is issued to be implemented in practice.

**b. *What is the goal of ecological compensation?***

The goal is related to ‘quantity and ‘quality’ of nature area associating with the question on how to improve or at least maintain the existing of nature area that has intended ecological value. ‘No net loss’ principle is the basis practice for ecological compensation.

**c. *If compensation is decided as appropriate alternative should be taken, what approach could be taken for completing ecological compensation, and how it can be done?***

Ecological compensation must be related to land availability. To obtain the land, it can be based by voluntary approach or forced by law. Through voluntary approach, landowner intends to sell the land based on agreement between landowner and government. The agreement can be facilitated by land trust organization.

**d. *What social issue that may be influenced by the implementation of ecological compensation***

To obtain the land as compensation area, it is possible to cause people to be resettled to another place. Because of that, most of people have to change their occupation due to the condition of new place. For example, the farmers resettled to harbour area may change their occupation to be fisherman. However looking at the Netherlands experience, the resettlement is not always dissatisfying the affected people. In fact, some of them get more advantages by changing their occupation.

***e. How potential social conflict in the implementation of ecological compensation can be reduced?***

- Starting for permit process, all projects have to be checked on economic and social implication. Based on that consideration, compensation may be an alternative that should be taken. However, if the impacts are too complicated, the projects will not get the permit.
- Making projects gradually in the long term like making plan for project in several fiscal years. It means that by extending the duration of project, it will provide more time to make reconciliation with landowner and other affected groups, hence social conflict can be minimized.
- The enforcement by law may be needed for a certain case to achieve a certain ecological targeted value.

## 2. THE INTERVIEW WITH AREND KOLHOFF

He works at Netherlands Commission for Environmental Assessment as technical secretaries international cooperation. The interview had been done on June 18, 2008.

The interviews were guided by the following questions and issues:

**a. *Related to possibility environmental impacts caused by projects, how are road projects assessed?***

There is a sequence of environmental performance consisting of avoid, minimise and compensation actions.

**b. *If compensation is decided as appropriate alternative should be taken, what approach could be taken for completing compensation, and how it can be done?***

The term 'compensation' in EIA relates to 'in case compensation' which is related to financial compensation, and 'in kind compensation' which is related to property compensation by offering another house or land to affected communities. However, to restore, enhance and replace the destructed land, the compensation approach is determined based on contextual condition.

Ecological compensation is guided by targeted ecological value which is indicated by value of ratio between compensation area and compensated area. Nevertheless, the ratio still becomes main topic in international environmental discussion, for example international standard is 1 : 5, meanwhile NCEA recommends 1 : 2,2-2,5.

**c. *What social issue that may be influenced by the implementation of ecological compensation***

Compensation must be related to people or affected groups, because it has to deal with heterogeneous people in social classes and interest. Highly potential social conflict may be occurred when the land for compensation is obtained by resettling poor people living at squatters. However, in general, social issues that may be affected by ecological compensation policy are related with the issue in landownership and in participation mechanism for poor community. These social issues may be relevant to the condition in Indonesia.

**d. *How potential social conflict in the implementation of ecological compensation can be reduced?***

- Making save projects from social conflict. It means that the projects are implemented in separated area from the land that mostly people used. For example, road construction is developed in the area that has distance from settlement area.
- Participation in contextual situation. However, the challenges of the participation is related to issue on:
  - How to make participation is independent from external pressure
  - How to accommodate poor people or other disadvantages people' interests. The mechanism should be suitable with contextual condition.

## APPENDIX II. LIST OF ABBREVIATIONS

ACOE	: Army Corps of Engineers
AMDAL	: <i>Analisis mengenai Dampak Lingkungan</i>
CEQ	: Council in Environmental Quality
CLT	: Community Land Trust
CWA	: Clean Water Act
DEC	: Department of Environment and Conservation
EIA	: Environmental Impact Assessment
EIMA	: Environmental Impact Management Agency (BAPPEDAL)
ELI	: Environmental Law Institute
EMA	: Environmental Management Act
EPA	: Environmental Protection Agency
FHWA	: Federal Highway Administration
FWPCA	: Federal Water Pollution Control Act
GAO	: Government Accountability Office
ICEL	: Indonesian Center for Environmental Law
MBRT	: Mitigation Banking Review Team
NEPA	: National Environmental Policy Act
NIMBY	: Not In My Back Yard
NRC	: National Research Council
OECD	: Organization for Economic Co-operation and Development
PCSD	: President's Council on Sustainable Development
SIA	: Social Impact Assessment
TEA	: Transportation Equity Act
WCED	: World Commission for Environment and Development