Feasibility and Justification of Climate Mitigation Actions MRV for Developing Countries: Comparative Analysis of China and Indonesia

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Abstract

In the international climate negotiation forum UNFCCC, MRV, stands for Measurement, Reporting and Verification, is a mechanism to track and monitor countries' individual and aggregate progress in reducing greenhouse gas emission. Developed countries want MRV to assess contributions of developing countries to global mitigation actions. On the other hand, developing countries want support for the mitigation actions and MRV from developed countries, since according to the principles of the UNFCCC developing country Parties are not obliged to mitigate. Within developing countries themselves, the discrepancies between LDCs /SIDS and advanced developing countries lead to different degrees of acceptance toward MRV.

This thesis aims to analyse the feasibility and justification of climate mitigation actions MRV for developing countries from the perspective of China and Indonesia. The research is done at international and national level. At international level analyses comprised of the debates, decisions and agreements on MRV, with consideration on the provisions and principles of the UNFCCC. While at national level the analyses include policies and actions taken toward MRV implementation, national circumstances and environmental informational governance that correlates to establishment of MRV system. Literature review and documentation analysis were done to collect preliminary data and develop conceptual framework for feasibility assessment. Then, interviews were conducted with government officials and experts from China and Indonesia, as well as international experts and observers/negotiators on MRV issue to gather the perspectives on feasibility and justification.

By relating the findings of the analyses with the conceptual framework, conclusions were drawn to signify the feasibility and justification of establishing MRV system in China and Indonesia. The results show that although it is feasible to implement MRV, China and Indonesia view the MRV requirements as not justified. Nevertheless, both countries are trying to create an MRV system purposely for domestic interest, and conditional to the international support received. It is hoped that these results can give insight, enhance understanding and provide meaningful guidance for other developing countries and international community in regards with MRV implementation.

Keywords: Climate change, Mitigation actions, MRV, China, Indonesia, Feasibility, Justification.

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I dedicated this thesis to my beloved family: my dear husband and best friend Aum Cakra Tidianto, my preciouses Ammar, Tsara and Farah Tidianto, my dad Kamiluddin Tahar and my late mum Hasni Kamil, my Ibu Yanimar, my mother-in-law Siti Aliyah Pradono, my late father-in-law Iwan Pradono and the whole extended family of Kamiluddin Tahar and Iwan Pradono (my sisters, brothers, in-laws, nephews, nieces, aunts, uncles and Uyut). Thank you for all the love, prayers, and best wishes.

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For the big family of PPI Wageningen, thank you so much for the companionship the joyful ride. I'm going to miss each and every one of you, and our wonderful (karaoke) time together. Here's to our achievements and successful future.

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ADP : Ad Hoc Working Group on the Durban Platform for Enhanced Action
AMDAL : Analisis Mengenai Dampak Lingkungan (Environmental Impact Assessment)
AFOLU : Agriculture, Forestry and Other Land Use
ASEAN : Association of Southeast Asian Nations
BAP : Bali Action Plan
Bappenas : Badan Perencanaan Pembangunan Nasional (National Development Planning Agency)
BAU : Business As Usual
BMKG : Badan Meteorologi, Klimatologi dan Geofisika (Meteorology, Climatology and Geophysical Agency)
BPK : Badan Pengawas Keuangan (Agency for Financial Audit)
BUR : Biennial Update Report
CBDR : Common But Differentiated Responsibility
CCP : China Communist Party
CDM : Clean Development Mechanism
CGE : Consultative Group of Expert
COP : Conference of Parties
CRED : Centre for Research on the Epidemiology of Disasters
DANIDA : Danish International Development Agency
DFID : Department for International development
DNPI : Dewan Nasional Perubahan Iklim (National Council on Climate Change)
DNA : Designated National Agency
DPR : Dewan Perwakilan rakyat (House of Representatives)
EC : European Community
EU : European Union
FRIS : Indonesia's Forest Resource Information System
FYP : Five-year Plan
GEF : Global Environmental Facility
GDP : Gross Domestic Product
GHG : Greenhouse Gas
GoI : Government of Indonesia
GONGOs : Government-Organized Non-Governmental Organizations
GIZ : Gesellschaft für Internationale Zusammenarbeit
IAR : International Assessment and Review
ICA : International Consultation and Analysis
ICCSR : Indonesian Climate Change Sectoral Roadmap
ICCTF : Indonesia Climate Change Trust Fund
ICRAF : International Center for Research in Agroforestry
IEA : International Energy Agency
INCAS : Indonesia's National Carbon Accounting System
IPCC : Intergovernmental Panel on Climate Change
IPPU : Industrial Processes and Product Use
IUCN : International Union for Conservation of Nature
JI : Joint Implementation
JICA : Japan International Cooperation Agency
LDC : Least Developed Countries
LEDS : Low Emission Development Strategy
LoI : Letter of Intent
LULUCF : Land Use, Land Use Change and Forestry
MEMR : Ministry of Energy and Mineral Resources
MEP : Ministry of Environmental Protection
MER : Monitoring, Evaluation and Reporting

MEWS : Meteorological Early Warning System
MoA : Ministry of Agriculture
MoE : Ministry of Environment
MoF : Ministry of Finance
MoFor : Ministry of Forestry
MoPW : Ministry of Public Works
MoT : Ministry of Transportation
MoHA : Ministry of Home Affair
MPR : People's Consultative Assembly
MRV : Measurable Reportable and Verifiable
MS : Member States
M&E : Monitoring and Evaluation
NAMA : Nationally Appropriate Mitigation Action
NAMAC : Nationally Appropriate Mitigation Commitment
NBSC : National Bureau of Statistic of China
NCCC : National Council on Climate Change
NCCCC : National Coordination Committee on Climate Change
NCs : National Communications
NDRC : National Development and Reform Commission
NGOs : Non-Governmental Organizations
NLGCC : National Leading Group on Climate Change
QA : Quality Assurance
QC : Quality Control
OECD : Organization for Economic Co-operation and Development
OFDA : Office of Foreign Disaster Assistance
OGI : Open Government Information
OGP : Open Government Partnership
PEP : Pemantauan, Evaluasi and Pelaksanaan (Monitoring, Evaluation and Reporting)
PRC : People's Republic of China
PROPER : Program Penilaian Peringkat Kerja Perusahaan (Evaluating and Assessment Mechanism for Companies)
RAD-GRK : Rencana Aksi Daerah Penurunan Emisi Gas Rumah Kaca (Local Action Plan for Reducing Greenhouse Gas Emissions)
RAN-GRK : Rencana Aksi Nasional Penurunan Emisi Gas Rumah kaca (National Action Plan for Reducing Greenhouse Gas Emissions)
RANPI : Rencana Aksi Nasional Perubahan Iklim (National Action Plan on Climate Change)
REDD : Reducing Emissions from Deforestation and Forest Degradation
RKP : Rencana Kerja Pemerintah (Annual Government Work Plan)
RPJMN : Rencana Pembangunan Jangka Menengah Nasional (Medium-Term Development Plan)
SBI : Subsidiary Body for Implementation
SBSTA : Subsidiary Body for Scientific and Technical Advice
SEPA : State Environmental Protection Agency
SFM : Sustainable Forest Management
SIDS : Small Island Developing States
SIGN : Sistem Inventarisasi Gas Rumah kaca nasional (National Greenhouse Gas Inventory system)
SOP : Standard Operating Procedures
TNA : Technology Needs Assessment
UK : United Kingdom
UKL : Upaya Pengelolaan Lingkungan Hidup (Environmental Management Action)
UKP4 : Unit Kerja Presiden Bidang Pengawasan dan Pengendalian Pembangunan (Presidential Working Unit for Supervision and Management of development)

UNCBD : United Nations Convention on Biological Diversity
UNCED : United Nations Conference on Environmental and Development
UNDP : United Nations development Programme
UNEP : United Nations Environment Programme
UNFCCC : United Nations Framework Convention on Climate Change
UPL : Upaya Pemantauan Lingkungan Hidup (Environmental Monitoring Action)
US : United States
USD : United States Dollar
VA : Vulnerability Assessment
WBCSD : World Business Council of Sustainable development
WTO : World Trade Organization

Chapter I

Introduction

Climate Change is a global problem that requires shared actions to respond to its challenges and to tackle its adverse effects. Dangerous human interference with the climate system can only be avoided if major GHGs emitting countries are committed to take sufficient measures of mitigation actions. In order to ensure that there will be no 'free-riders' in the shared actions, information on strategies, policies and actions taken by countries needs to be made available in an accountable manner (Bakker et al., 2010).

In current international climate change regime, the accountability of such information is known as MRV, which stands for *measureable, reportable and verifiable*. Transparent and accountable MRVed information is essential to build trust among countries, help to ensure environmental integrity, good climate governance and constructive social outcomes. Furthermore, there is a growing realisation for the need of a common reporting format that is comparable, consistent, and accurate. However, recalling the disparity and diversity within the group of developing countries in the climate change regime, flexibility is needed in order to accommodate different types of policies and capacities of it respective member countries.

1.1. Problem Description

1.1.1. The lack of clarity on MRV issue at the international climate regime

The Bali Action Plan (UNFCCC, 2007) introduced the notion of linking GHG mitigation actions in developing countries with support for such action. It coined the term "measurable, reportable and verifiable (MRV)" which is the manner of information system of Parties' national mitigation actions. However, it did not specify the relationship or link that could be made between nationally appropriate mitigation actions (NAMAs) in developing countries and mitigation support. The term itself led to many questions and interpretations including what M, R and V are, what they should apply to, who should undertake them, and how. It also remained unclear whether the MRV requirements apply to the link between NAMAs in developing countries and mitigation support, or to one or both of the separate elements (Ellis and Larsen, 2008).

Through series of meetings, negotiations and discussion on MRV at the international or regional level, there seem to be a loosely mutual agreement that MRV refers to a set of processes and procedures through which factual information is provided, assessed and checked to determine whether, when and how Parties effectively meet their respective targets in reducing emissions.

Thus, MRV is crucial since it entails provisions of transparency and accountability which are needed to assess countries' performance and compliance to the decisions made in the international climate change negotiations (Wemaere, 2009).

A robust MRV system will benefit both developed and developing countries. For developed countries, MRV is important to measure and control whether other countries with obligation to reduce their greenhouse gas emissions do so as pledged. For developing countries, MRV provides a range of functions namely to identify mitigation potentials, to get international recognition and supports to implement these climate mitigation actions taken, and to help the country itself with its own domestic implementation since up to date and credible information will provide national government with the basis to understand the impact of their policies and to identify areas that are lacking behind in meeting their target (Fransen, 2009).

The key issues in the post-Kyoto period of the climate change cooperation are related to financial matters, shared vision of limiting global warming to 2 degrees Celsius target and stringent actions to achieve this target both by developed and developing countries. MRV become an important issue that needs to be addressed since the measured, reported and verified on both mitigation actions and the supports for actions can enhance countries' effort and ensure that the support provided by developed countries "match" with the implementation of GHG mitigation actions in developing countries. Thus, MRV could help facilitate strategic and cost-effective decision-making on mitigation policy, strengthen mutual confidence in country's actions and in then international regime, and thereby enables a stronger collective effort (Breidenich and Bodansky, 2009).

However, there are concerns toward climate mitigation actions MRV for developing country Parties in the international climate negotiation forum caused by lack of clarity on provisions and technical aspects of MRV. There is yet a clear guideline for developing countries MRV albeit a general one; no agreed-upon decision on the accounting methodologies and way of implementation of the MRV system; lack of clarity on who, when, how and what to be MRVed; debate over the design of MRV between a standardized (top-down) versus non-standardize (bottom-up) mechanism; and availability of support in terms of financial, technology transfer and capacity building (Moncel et al., 2011). There are also matters of acceptability, participatory, fairness, credibility and viability of the MRV for developing countries, topped by the principles of *common but differentiated responsibility* and *respective capability* as the basis of international climate change cooperation that must be taken into consideration (CAN, 2011). And since the Copenhagen Accord stipulated that national mitigation actions seeking

international support will need to be verified by an international entity, the issue of national sovereignty entails.

1.1.2. Conflicting positioning between developed and developing countries over MRV issue

Apart of the problem regarding practical matters, there are other divergences between developed and developing countries on the MRV issue. The existing climate regime already includes various reporting activities in the form of National Communications (NCs) and national GHG inventories (Niederberger and Kimble, 2011). Developed country Parties need to submit national GHG inventories annually, NCs every four years and updates on their emission reductions every two years. Developing country Parties on the other hand need to submit NCs and greenhouse gas inventories every four years. This discrepancy seemed inadequate and insufficient to monitor GHG emissions, especially for major developing countries. COP 16 in Cancun confirmed that UNFCCC reporting framework for developed and developing countries should be more comprehensive and include more frequent report.

The Cancun Agreement (UNFCCC, 2010) established new and additional responsibilities for developing countries or non-annex 1 Parties to enhance the measurement, reporting, and verification of mitigation actions and GHG inventory. These requirements were furthered at COP 17 in Durban, South Africa, where the Parties to the UNFCCC decided that non-annex 1 Parties, in accordance with their respective capabilities and level of support provided, should submit a biennial update report (BUR) every two years, with the first BUR's deadline on December 2014. The BUR should contain information on the national circumstances and institutional arrangements relevant to the preparation of National Communication; national GHG inventory; mitigation actions and their effects; constraints and gaps, and related financial, technical and capacity needs, as well as the level of support received. Information submitted in the BUR has to be MRVed, while mitigation actions taken with international support will be subject to international consultation and analysis (UNFCCC, 2011).

While IPCC has established guidelines for national GHG inventories report, guidelines for NAMAs and its MRV has not existed yet. A framework for national climate mitigation actions should be developed, including types of policies for measurement, reporting and verifications of the actions. The NAMAs MRV guidelines should be consistent, transparent, verifiable, objective, relevant and simple. Questions arise on which actors have the ability to conduct MRV and particularly on who to conduct the verification process (Winkelman et al., 2011).

Another problem is related on the standards of the reports. Without standardized reporting rules, Parties to the UNFCCC may report using their own standards. This could generate

confusion and lack of trust among Parties themselves. Developed countries want the same standards for all, whereas developing countries want different standards for both groups. Developing countries also seek financial support to enhance capacity building to do MRV, whereas developed countries thought that the lack of capacity for measurement and reporting not only stems from funding problems but also from the fact that developing countries' reports are not subject to third party verification. And while developing countries want additional supports, they are concerned that if their emissions are being closely monitored, they may become vulnerable to pressure to cap those emissions (McMahon and Moncel, 2009).

Climate mitigation actions MRV for developing countries has also become a trade-off issue between developing and developed countries. Developing countries would like to have a legally binding agreement in which developed countries increase their level of ambition in emission reduction target, while at the same time ensuring availability and continuity of support to address developing countries' needs. On the other hand, developed countries want major economic developing countries –prominently China- to also participate in mitigating climate change and to be transparent about the actions that are taken. Thus, MRV provides an important means of tracking countries' progress toward meeting the Convention's objective, and the accountability and transparency it brought on would play a particular role in building trust between developed and developing countries. For these reasons, MRV is one of a tangible issue that needs to be clarified in order to achieve an international legally binding agreement in post-2012 period.

1.1.3. The challenge of implementing climate mitigation actions MRV for developing countries at national level

Although developing countries in general agreed to MRV requirements, there are different levels of acceptance and perceptions among them. The lack of clarity on the technicalities of MRV for developing countries does not help the case, and so there are uncertainties on how to move forward with the implementation of MRV for developing countries. On the biennial update report (BUR) which has the closest deadline, there is lack of clarity on the level of detail required of the report and how it should be MRVed. It remains a concern of whether developing countries could meet the deadline and submit the MRVed BUR on time.

Problems also arise regarding the implementation of MRV at the national level. This research perceived climate mitigation MRV as one form of a general auditing process. Auditing can be loosely interpreted as a practice of checking and giving the accountability of an organizational process or activity (Power, 1999) . Practice of audit arose from the demands for good governance, and to make individuals and organizations accountable. Yet, the demands and

expectations of audit practice are not easily compatible with operational capabilities. Operational capabilities can refer to many things including regulatory matters, institutional arrangements, human capacity and financial condition. The epistemic aspect of human capacity in auditing is shown in Figure 1 below:

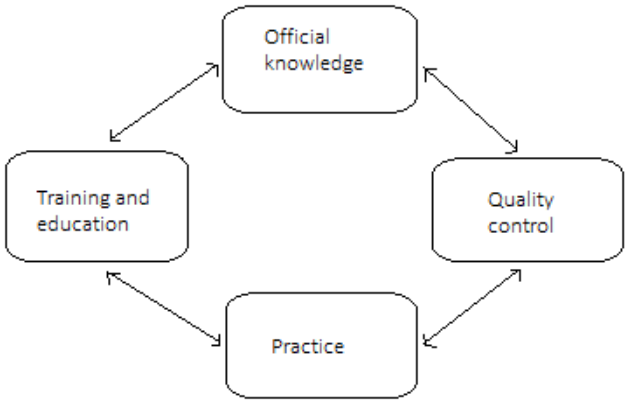

Figure 1. The system of auditing knowledge (Power, 1997). This system has four principal elements, which are the official knowledge of audit practice; training and education as mechanisms by which the knowledge is disseminated to practitioners; the practice of audit itself; and quality control to maintain the quality of audit practice.

As can be seen from the figure, the practice of auditing requires a holistic epistemic cycle. These elements could be further refined, developed, or adjusted; yet they provide the essential structures which support and reproduce the knowledge base of auditing practice. They are the basic requirements for a robust auditing. Thus, the measures that should be taken in order to increase this particular operational capability takes a lot of effort and is often costly for the auditees, while on the other hand there is lack of assurance that audit will improve efficacy of reaching desirable outcomes. The dilemma could disincentivize auditees in conducting auditing practice.

This dilemma is depicting the problems of MRV implementation for developing countries. Establishment of MRV system at national level requires planning, effort, human resources and adequate funds. With limited financial resources and capacity building, developing countries as "auditees" are faced with quandary to prioritize, whether to allocate their resources to develop and implement MRV or to focus on enhancing mitigation and adaptation actions.

This research is taking China and Indonesia as unit of analysis. China and Indonesia were selected as they are major economic developing countries whose high economic growth has placed them among the large carbon emitting countries in the world. Figure 2 below shows China and Indonesia's rank as CO2 emitter countries:

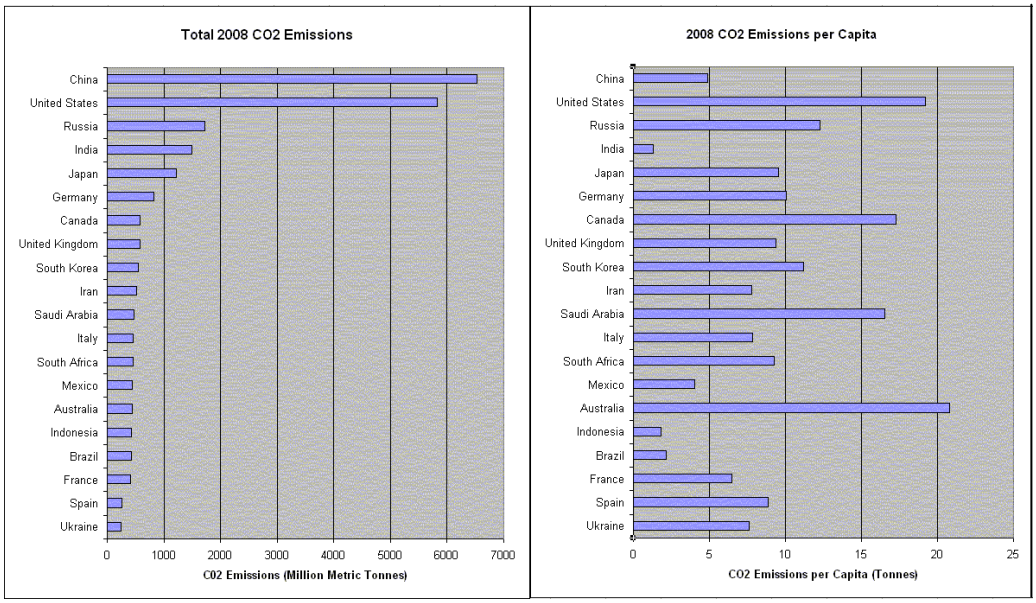

Figure 2. The 20 countries that top total CO2 emissions and CO2 emissions per capita (Source: www.ucsusa.org)

China and Indonesia are also key players among developing country Parties both in the international climate negotiation, and within the Group of 77+China. In regards with MRV for developing countries, Indonesia was among the first countries which embraced the decisions on this matter, while China was initially reluctant to accept such requirement. It is therefore interesting to analyse what motives and rationales contributed to both countries' positions toward MRV issue. The analyses will include the overview of conditions and circumstances in China and Indonesia, the governance that shaped preferences and behaviour towards MRV issue in the international arena, the policy and regulations that have been adopted in relation to MRV issue and the institutional arrangements made to implement and accommodate those policies and regulations.

1.2. Research Objective

Based on the above backgrounds, the main objective of this research is **to analyse the feasibility and justification of climate mitigation actions MRV for developing county Parties under the UNFCCC** by gaining and improving understanding of the implementation of MRV for developing countries, and by identifying gaps constraints, challenges and opportunities in implementing MRV.

In general, to study about feasibility means to examine whether it is possible (or reasonable or profitable) to do something. The study of feasibility could also mean an analysis of possible solutions to a problem and a recommendation on the best alternative. It can decide whether a process can be carried out by a new system or structure more efficiently than the existing one

(Kitnaes and Zingstra, 2010). Meanwhile, justification in general could be seen as reasoning on why a process should or should not being carried out.

To reach this objective, analysis is done at international and national level. At international level, this research will look at the agreements and decisions on MRV for developing countries, the provisions encompassing the issue, and the basic principles of the convention itself, which are becoming the standing ground for debate between developed and developing countries. At national level, the research will look at national circumstances which covered among others national capacity, governance, constraints and interest, and expectation in implementing MRV for developing countries. The findings and analysis of this research are expected to give a clear overview, understanding and conclusions in regards with MRV issue in climate change negotiation.

This research aimed to provide a comprehensive picture of implementation of MRV for developing country parties. By understanding national MRV related systems of China and Indonesia, other developing countries and international community can gain insights on the gaps and constraints, opportunities and challenges faced in establishing MRV system at national level. Furthermore, this research is expected to contribute to the growing body of literature regarding MRV and mitigation actions, particularly for developing countries.

1.3. Research Questions

1.3.1. General Research Question (GRQ)

In order to achieve the research objective above, the following General Research Question serves as the guide to the course of this research:

Based on the circumstances at international and national level in China and Indonesia, is the implementation of climate mitigations actions MRV for developing countries feasible and justified?

1.3.2. Specific Research Questions (SRQs)

Several research questions were developed in order to answer the GRQ. The specific research questions are as follow:

SRQ 1: What is the current update of the climate negotiation and what agreements/decisions that have been reached on the issue of climate mitigation actions MRV for developing countries?

SRQ 2: What policies have been adopted by China and Indonesia toward implementation or enabling implementation of climate mitigation MRV?

SRQ 3: How is the state of governance in China and Indonesia, in particularly their environmental informational governance that directly linked to the monitoring and reporting system?

SRQ 4: What constraints faced by China and Indonesia in implementing climate mitigation actions MRV requirement?

SRQ 5: What are the interests/expectations of China and Indonesia in establishing MRV system?

SRQ 6: How do China and Indonesia perceived the enhanced requirements of monitoring, reporting and verification of their national mitigation actions?

A literature study has been conducted on the topic of climate change and policy in general, and on climate mitigation actions and MRV in particular. A document analysis was also conducted on climate negotiation agreements that have been reached among Parties to the UNFCCC regarding the issue, and that are being delivered in the COP decisions. This research also looked at the bigger picture where MRV is part of the countries' reporting mechanisms, and linked to countries' mitigation action, GHG Inventory, and low carbon strategies. The EU MRV system will be explained in chapter III as an example of developed countries MRV that has included these linkages.

This research is analysing and making comparison of China and Indonesia's policies and perspectives toward MRV requirements for developing countries. They are considered as the more advanced in developing country Parties in term of mitigation target and subsequently on MRV establishment. However, there were different levels of acceptance between the two countries, of which China and Indonesia represent the more reluctant and the more willing in acceding to MRV requirements respectively.

Based on the research objective and research questions, a conceptual framework is developed. At the international level, the research is assessing the principles, decisions and provisions of the climate negotiation forum. At national level, this research is addressing the climate governance, and the interest and expectation of the government of China and Indonesia in implementing MRV requirement. Figure 3 below presents the conceptual framework of this research:

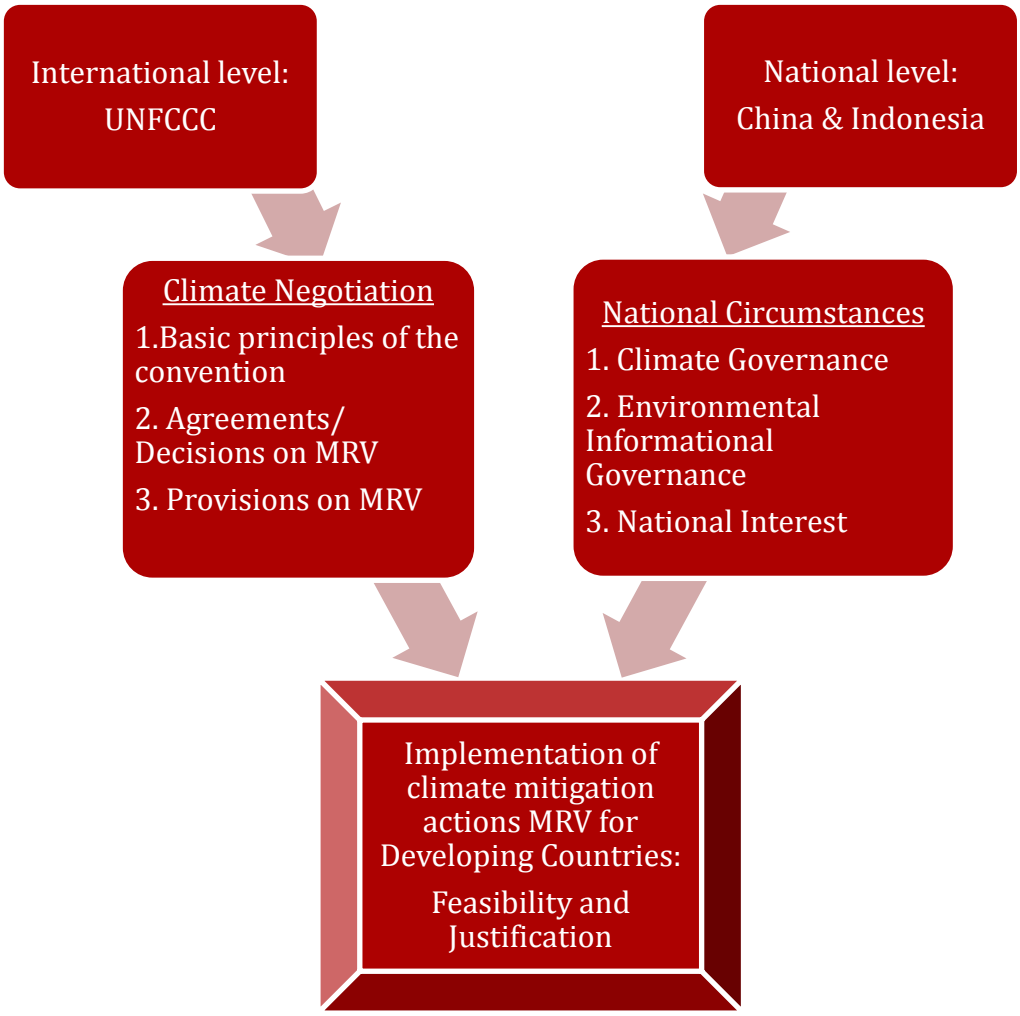

Figure 3. Conceptual Framework based on the research objective and questions

1.4. Methodology

1.4.1. Study Design

This research is a qualitative research that aimed to analyse the issue of climate mitigation actions MRV for developing countries, within the scope of the negotiation at international level and the implementation at national level. To reach the objective of understanding the complexity of MRV implementation at national level, a comparative study design is developed with China and Indonesia as units of analysis. The aspects to be analysed include each countries' policies, actions and perceptions toward climate mitigation actions MRV. On these aspects, China and Indonesia shared some similarities but also some differences that are interesting to be assessed.

In order to have a rich and comprehensive analysis, this research focuses on several variables that are grouped into two levels of analysis: international and national level. The variables at international level include the principles of the UNFCCC that serve as the basis of cooperation

within the climate regime and the provisions for the MRV for developing countries. The principles meant here are the common-but-differentiated-responsibility, voluntary nature for developing countries in taking actions to mitigate climate change, and consideration to national circumstances and respective capabilities of developing countries to take such actions. While the provisions include the guidelines and methodologies for MRV, framework and design, and support from developed to developing countries on MRV.

At national level, the variables include national climate governance related to MRV implementation, environmental informational governance, national constraints in establishing MRV system, and national interest or expectation in implementing/establishing MRV. The aspects in both levels are determined based on the preliminary literature study, data collection and findings on the topic, all of which will be explained further in the following section. Table 1 below show the variables and scope of analysis, for the operationalization of the research:

Table 1. Operationalization of research: Variables and Scope of Analysis

Variables of analysis			Scope of analysis
Inter-national level	Principles of climate regime	Common but differentiated responsibilities	National pledge/target on emission reduction
		Voluntary actions for developing countries	National mitigation actions plan or strategy
		Consideration of countries' circumstances and respective capabilities	National capacities and capabilities to implement MRV
	Provisions for MRV for developing countries	Guidelines and methodologies for MRV	Proposed/existing guidelines and methodologies
		Framework/design of MRV for developing countries	Proposed/existing framework and design
		Support from the international climate regime or other developed countries	Availability of financial, technology, capacity building support, expert consultation and assistance
National level	National circumstances	Climate Governance	Policy and actions taken, and capacity to address climate change
		Environmental Informational Governance	State of data collection, processing, flow and access Existing monitoring and evaluation system
		Involvement of non-state actors	Pressure/interest of domestic non-state actors
	National constraints	Economic	Economic growth Financing of climate mitigation actions and MRV
		Political	Incorporation of climate policy in national development plan Political will and commitment of leaders
		Organizational/Institutional	Institutional arrangement on NAMAs MRV implementation
		Cultural/Interpretational	Level of openness, transparency, accountability
		Other gaps, opportunities and challenges	Technical matters or other hindrances
	National interest	Help to achieve national mitigation target	National mitigation target
		International acknowledgement and supports	UNFCCC and International recognition Financial, technology, capacity building support achieved
		Domestic policy incentives	Co-benefit of enhanced knowledge and capacity, fulfill domestic groups' pressure, reduce vulnerability and other environmental problems

1.4.2. Country Selection

This research is analysing of China and Indonesia for several reasons. The first two reasons have been discussed previously, which are the status of the countries as emerging/major economy

developing countries and their positions in the list of 20 top CO2 emitters in the world. In the group of G77+China in the international negotiation forum, China and Indonesia are not included in the LDCs and SIDS groups. This is important because with regards to MRV agreement, the LDCs and SIDS have been given special treatment with even less stringent requirements in terms of reporting. And as China and Indonesia have stated their pledge of emissions reductions and incorporate this pledge in their respective development plans (Zhao, 2010), it is significant to assess these countries' MRV policies.

Thirdly, both China and Indonesia are among the first countries which embrace the Copenhagen Accord, an agreement that mentioned the requirement of enhanced MRV for developing countries for the first time. China stated its plan to limit its greenhouse gases output by reducing its carbon intensity in 2020 to up to 45% from 2005 baseline[1]. Yet China has consistently opposed to developing countries' NAMAs MRV, specifically in terms of opening up to international verification. Meanwhile, in G20 meeting in 2009 Indonesia has stated its pledge to reduce its emission in 2020 up to 26% by unilateral voluntary actions based on business-as-usual (BAU), and up to 41% with international support. In Copenhagen meeting later that year, President Yudhoyono reiterated that pledge and further stated that Indonesia is accepting MRV requirements and will be open to international consultation and analysis. He repeated the support on MRV in his statement in Durban meeting in 2011.

The last reason to take China and Indonesia as case studies is the contradictions that seem to exist between both prominent developing countries. China has significant resources in terms of technology, human capacity and financial capability to establish a robust MRV system, Indeed, the government of China has planned to develop an "MRV regime amongst the best in the world" (Zhao, 2010 p. 7). However, this MRV regime is not intended to comply with UNFCCC obligation, rather it is to enhance China's own national climate strategy and energy efficiency target. On the other hand, Indonesia requires international support in terms of technology transfer, capacity building and financial resources- to be able to establish an MRV system. Yet Indonesia is directing its MRV policy to fully comply with UNFCCC obligations.

With strong international pressure on China in order to become more transparent in its mitigation actions and GHG inventory, China self-sufficiency enables it to evade developed countries' demand for an international verification. Yet, instead of pledging for a stringent target to cap emission, China only adopted a 'loose' target to reduce carbon intensity. On the other hand, Indonesia susceptibility makes it prone to international scrutiny. Yet, Indonesia has

[1] www.news.bbc.co.uk accessed on 14 November 2012 at 22.50.

pledged an emission reduction of 41% if supported, the highest pledge by a developing nation so far. Thus, this contradiction is interesting to be analysed.

China's unconditional commitment:
To reduce carbon intensity by 40-45% by the year 2020, based on the year 2005 level.

Indonesia's non-binding target:
To reduce emissions by 26 % by the year 2020 based on business-as-usual (BAU) and 41% with international support.

Figure 4. China and Indonesia's mitigation commitment and target

1.4.3. Data Collection and Analysis

In order to gain comprehensive understanding of the study, this research utilizes data collected from literature study, documents analysis and resource person interviews. The collected data is divided by primary data and secondary data. Primary data are obtained by conducting semi-structured, in-depth interviews with experts and practitioners in the respective area. Interview is used as method of data collection because it could provide in-depth information regarding factual data, opinion, views, perspective and suggestions of the interviewees. Semi-structured interview is chosen instead of structured interviews in order to maintain flexibility in gathering information and exploring related topics which may not be identified before in the literature review. Interviews are conducted through face-to-face interview, via phone-conference or Skype conference, and written emails. The interviewees include international MRV negotiators and international MRV experts, national MRV experts from both China and Indonesia, government officials who follow MRV negotiations under UNFCCC and/or who are in charge of MRV-related policy making, and other organisations or related actors that are involved in MRV negotiation or policy-making, or have an interest in establishment of MRV systems at national level.

In addition to primary data explained above, this research also used secondary data. This type of data is sourced from literature study and internet sources, and from documents that are for

example the international climate negotiation decisions/plans/agreements, working papers by international institutions or NGOs, national regulation/policy/planning documents, and other scientific journals. All of these data collection methods were done simultaneously and in no particular order. Table 2 below shows the explanation of data collection method and analysis:

Table 2. Data sources, data collection and analysis

Research Questions	**Data Sources**		**Data collection methods**	**Data analysis**
GRQ SRQ 1,2,3, 4,5,6	Primary data sources: resource persons/ stakeholders interview	International MRV negotiator	Semi-structured interviews Information analysis	Interpretive methods
		International MRV expert		
		National MRV expert		
		Government officials		
		Non-state actors		
SRQ 1,2,3	Secondary data sources	Books, reports, journals, UNFCCC decisions, newspaper and electronic paper coverage on MRV negotiation, etc.	Information analysis	Interpretive methods

Next step after data collection is data analysis. In this research, data and findings were evaluated by using the theories utilized in the section of theoretical framework. They are then categorized using the criteria and indicator developed to give values on the feasibility and justification in implementation and establishment of NAMAs MRV at national level. Finally, these data are analysed by methods of information analysis and interpretive techniques.

Chapter II

Research and theoretical framework

2.1. Overview of the theories utilized

This chapter presents an overview of the theories utilised in this research. The structure of the chapter will flow from the general concepts into the more specific ones. Further explanation is given on how these theories are merged and applied in this research.

2.1.1. Governance

Governance could be defined as the "sum of many ways that individuals and institutions, public and private, manage their common affairs" (O'Brien et al, 2000, p.2). While Young (2009, p.12) described governance as "social function centred on efforts to steer or guide societies toward collectively beneficial outcomes and away from outcomes that are collectively harmful". Bridge and Perreault (Bridge and Perreault, 2009) refer governance to the fundamental question of how organization, decisions, order and rule are achieved in heterogeneous and highly differentiated societies. At its core, governance addresses the problem of economic and political co-ordination in social life. Accounts of governance typically describe the form and geographical scale of socio-political institutions, identify key actors and organizations, and characterize how relations among these components may be changing.

Betsill (Betsill, 2007) gave several broad definitions of governance which are "non-hierarchical forms of steering which include either private or both private and public actors", "multiple modes through which governing can be accomplished" and "any form of creating or maintaining political order and providing common goods for a given political community on whatever level". From these broad definitions, Betsill furthered the term "governance" to include several features as follows:

1. Governance is defined by the public nature of its goals, concerned with conducting the public business and seeking to achieve some form of public goods.
2. Governance is regarded as ordered and intentional, has purposive acts of steering society and polity and server to guide and constrain future governing behaviour.
3. Governance is regarded as authoritative, or defined as the means of "authoritatively allocating resources and exercising control and coordination".

In summary, governance at every level of social organization refers to conducting public business with an arrangement of authoritative rules, institutions, and practices and mechanisms of which any collectivity manage its affairs, and embedded with social relations that enables the governing itself to take place. In relation to climate change, there is distinct tendency which is transnationalisation of climate governance which was caused by the high density of transnational actors involved, cross-border interests and coalitions, complexity of issues and opportunities and incentives for engagement of market authority/business actors. Further explanation about climate governance will be discusses in the next theory.

In order to assess the issue of MRV for developing countries requirement by the UNFCCC, this research divides the discussion of governance into two levels: global level and national level. The explanation in regards with governance at global level will include the definition of the international regime on climate change, and focus on the principles, agreements reached and provisions on MRV. While discussion on governance at national level will delve in the theories of environmental governance and environmental informational governance, which include aspects in both levels of discussion will then be the basis to building up of criteria and indicator for the feasibility and justification in valuing the implementation of MRV for developing countries.

2.1.2. Climate Governance: National and Transnational Governance

Climate Governance could mean all purposeful mechanisms and measures aimed at steering social systems toward preventing, mitigating or adapting to the risks posed by climate change (Jagers and Stripple, 2003). Climate governance is done at multiple level, be it international, regional, national and sub-national or local level. Climate governance, like other form of governance, includes both government and non-governmental actors. At each of these levels, climate governance could constitute assemblages of actors at various scales.

At national level, climate governance could be understood as domestic policy and actions that are taken to address climate change, through preventive, mitigative and adaptative strategies. In this research, the policy and actions adopted by the government of China and Indonesia will be assessed along with the capacity to implement the actions. Lastly, role of non-state actors in climate change governance, particularly in MRV issue, will also be analysed.

Institutions in general can be defined as persistent and connected sets of rules and practices that prescribe behavioural roles, constrain activity and shape expectations (Oberthür and Stokke, 2011). These sets of rules and practices could include:

1. “Negotiated” arrangement that are established intentionally by the governments and others non-governmental actors in order to shape policy outcomes and behaviour;
2. “Spontaneous” institutions that emerge from practice and interaction, the example being customary laws.

From a governance perspective, negotiated institutions are of particular interest because they may be employed instrumentally to bring about change and influence outcomes. Negotiated international institutions comprised of two components. The first is substantive rules and obligations to indicate socially desirable behaviour within the institution, which served as the principal instruments of governance that may affect behaviour of its member and have an impact on the issue in question. Secondly, unlike spontaneous institutions, negotiated institutions usually set out procedural rules for how participants are to make and implement decisions or change substantive provisions. Decision rules and other parts of an institution’s procedural component can be vital for its ability to adapt and respond to changes in the issue area it regulates, or in the state of knowledge on that area.

In this research, both international regimes and international organizations are considered equal as international institutions, and these terms can be used interchangeably. However, there is slight distinction where international regimes defined as the subset of institutions that involve states and concern behaviour within specific issue areas (Levy et al., 1995) . On the other hand, international organizations may also govern specific issue areas, but their distinctive features are the actor qualities that contracting states have endowed them with, such as a physical location, a staff of employees, and usually a legal personality. Accordingly, and international organization is a possible but not a necessary part of procedural components of an international regime.

The relevant example of the classification above is the WTO (World Trade Organization) which serves as an instrument for operating the global trade regime. In the area of environment however, there are several negotiated international institutions like UNEP (United Nations Environment Programme), IUCN (International Union for Conservation of Nature), GEF (Global Environmental Facility), and international regimes like UNCBD (United Nations Convention on Biological Diversity) and the UNFCCC as the climate change regime. However, they are standing on different basis and thus serving different purpose than unified organization as in trade issue area.

These international regimes and institutions constitute what is called as transnational governance. Transnational governance is a complex, distinct form of global governance,

consisting of transnational actors operating in a political sphere in which public and private actors interact across national borders and political jurisdictions (Andonova et al., 2009) . These actors are engaged in authoritative forms of governing to constitute transnational *governance* networks. The typology of transnational governance is based on the type of actors involved, and the recourse to authority. For this research, the focus is only on the type of actors involved, as follow:

1. Public transnational governance networks, which governance mechanism established by and for public actors.
2. Private transnational governance networks, where transnational network established and managed by private actors only.
3. Hybrid transnational governance networks, where actors from public and private sectors establish joint networks and merge the authority and governance.

This research is focused on the UNFCCC as the international regime on climate change, and how it governance affects the policy making at national level. Regarding MRV, it will be analysed whether the private sectors play role or involvement in the establishment of national system of MRV, and whether there is even a hybrid governance on this issue. Furthermore, according to the next theory below, negotiation under the UNFCCC is included in category of *'prolonged international negotiation process'.* This theory will also explain how such negotiation shaped states behaviour and preferences of interest.

2.1.3. Prolonged International Negotiation Process: climate negotiation and factors that shape state's preferences/interests

Currently, many international treaty negotiations are going on for years, and some are even take decades to reach a consensus. The international climate negotiations, trade negotiations, and law of the sea negotiations are the examples of such prolonged negotiations. Downie defined prolonged international negotiations as "substantive international negotiations over a legally binding instrument that continue for five or more years, beginning with a bargaining over a tentative agreement and concluding with bargaining over a ratification of that instrument" (Downie, 2012 p. 300). By the definition, we can see that there are three important aspects of prolonged international negotiation which are legal instrument, phases of negotiation and temporal dimension.

The definition above could include non-binding consecutive agreements and meeting rounds at bilateral or multilateral level that are done in order to achieve a substantive, legally-binding conclusion. In term of phases, the definition refers to bargaining phase where negotiating

parties set out the framework for an agreement and discussing the details of the agreement to be adopted, and to ratification phase where the negotiation takes place after an agreement has reached but before it enters into force. Lastly, prolonged period is considered to be five years or more since political and economic changes of a country usually occurs in five years cycles where there are changes within the government of a country. This change could affecting state preferences and positioning, thus could bring about what is called as ripple effect to the negotiation.

In explaining about state's behaviour in in prolonged international negotiation, Downie presented three inquiries. The first one is that state is not a unitary actor. He used the term 'two-level game' in which he argued that state and non-state actors at domestic level could affect the ability of negotiators at international negotiation in reaching the agreements. Thus, at international level (level I), government tries to keep a balance between satisfying domestic groups' pressures while minimizing negative consequences from its foreign counterpart. While at national level (level II), the domestic groups pressure their governments to adopt policies which they support, while governments correspondently trying to make coalitions with their national constituents to enhance its power.

The second inquiry is that state operates in a transnational network where cross-boundary activities of sub-units of government and non-state actors happen. These activities may or may not affecting state's behaviour in prolonged negotiation, depends on the level of interaction across the national boundaries. The third inquiry is the role of international regime, which defined by Krasner (Krasner, 1983) as "principles, norms, rules, and decision-making procedures around which actor expectations converge in a given issue area". State's behaviour in international negotiation is mostly centred around such international regime, such as the WTO for trade negotiation, UNCBD on biodiversity and UNFCCC for climate change.

Downie further stated that states' behaviour in prolonged international negotiation is different than in individual negotiation. In this forum, state's preferences are fluid, subject to different levels of actors' engagement, preferences of the chiefs of government, and changing state of experts' knowledge among policy elites. These preferences of states are contingent into factors that could be grouped into internal and external factors. Internal factor are variables that can cause a direct change of state behaviour either at international, national or local level. While external factor refers to variables that can affect internal factors but are independent of the negotiation process. The internal factors for example are level of engagement of actors (governments) in negotiation, new strategy in negotiation, role of non-state actors (which might be directly or indirectly involved in the negotiation) and changes in transnational network or

regime within which the negotiation is taking place. In contrast, the external factors are exogenous shocks or events that could potentially affect the course of the negotiation like the changed or improved state of expert knowledge among policy elites, natural disaster and extreme weather events like hurricane or major flooding, and other accidents such as the meltdown of Fukushima nuclear reactor in Japan or Chernobyl nuclear power plant disaster in Ukraine.

This research will incorporate the internal and external factors in evaluating the feasibility and justification of China and Indonesia in implementing climate mitigation MRV requirement. Based on preliminary data collection, there are factors that could be categorized as internal factor or external factor as assumed in this theory. In negotiation of the issue of MRV for developing countries, the internal factor that could affect China and Indonesia behaviour includes pressure from domestic groups and interest of non-state actors at national level, so that these major developing countries take measures of mitigation actions and be transparent about it. Other internal factors might be international acknowledgement and support expected for MRV implementation, expectation that MRV will help to achieve national emissions reduction target and domestic policy incentives in term of enhance capacity building, knowledge, and lesson learned from existing system. While external factor in the case of China and Indonesia are expectation to reduce countries' vulnerability to climate change and to diminish environmental-related problems like energy efficiency, air pollution, urban heat island and congestion/transport problem.

2.1.4. Environmental Informational Governance

Much of the social value, as opposed to analytical value, of the term environmental governance lies in its capacity to 'do political work' – that is, to suggest commonalities of purpose and interest that can obscure divergence and conflict. Indeed, to some observers the rise of environmental governance is symptomatic of a 'post-political condition' in which politics is reduced to the tactical practice of producing a consensus on the need for action in the face of an externalized threat (Swyngedouw, 2010). The popularity of environmental governance as an organizing concept, then, is partly independent of intellectual currents within social science and stems from its capacity to articulate managerial concerns about 'environmental problems' (Keil and Desfor, 2003). A definition of governance as 'attempts by governing bodies or combinations thereof to alleviate recognized environmental dilemmas' for example, reflects a managerial rather than analytical approach to governance that obscures the politics of definition (Davidson and Fickel, 2004). The politics of environmental governance, then, is a critical question to be

brought to the fore. It is a question that may be highlighted by asking simply governance of what, by whom, and to what end.

The concept of Informational Governance refers to the production, the processing, the use and the flow of, as well as the access to and the control over, information. In his book "Environmental Reform in the Information Age: The Contours of Informational Governance", Arthur Mol (Mol, 2006) emphasized the increasingly important role of informational governance in environmental governance practices and institutions. Furthermore, it is said that "informational governance refers not so much to the fact that information is important for addressing and dealing with environmental challenges…rather, the concept implies that for understanding the current innovations and changes in environmental governance, we have to concentrate on the centripetal movement of informational processes, informational resources and informational politics" (Mol, 2006 p. 227).

Mol stated that knowledge and information on the environment are crucial for environmental policy making, governance and reform measures and strategies. However, it is important to make a distinction between knowledge, information and data whereas abundance data may contain only little information, let alone knowledge. Environmental data often refers to numbers and figures on environmental conditions and environmental information that points out meaningful flows of signs for a targeted audience. Information then refers to raw data that are processes, selected and translated to address meaningfully an audience, whose in turn decide whether the information could be passed as knowledge or not.

The theory further explained about the shift from informational society to informational age, which bring about and brought about by the changes and innovations in the global modern world. This shift created the clustering of information-rich environments and information-poor environments. Most of industrialized countries, notably the OECD countries, belong to the first cluster. However, one can notice that there are particularities in the informational governance between United States, The Netherlands and Japan due to the various cultural, economic and political systems.

While the second cluster consists primarily of developing countries, not all industrializing states belong to this group. Mol provided four ideal-typical forms on information-poor environments, which in reality, these ideal types mix in nature. First, information-poor environments are driven by economic constraints and secondly by political constraints. Third, information-poor environments can relate to poor organizational-institutional conditions and environmental

capacities and fourthly, it can relate to problems in the cultural or interpretations frames of information, or to conflicting cultural or interpretation frames of information.

This theory is used to assess the condition and circumstances of China and Indonesia, on their state of environmental informational governance in terms of data collecting, data processing and data flow, along with existing reporting and monitoring system. It will then be analysed, what and how far is the importance of each country's state of environmental informational governance to the each of their policy-making processes related to climate mitigation actions MRV.

2.1.5. Feasibility and Justification

According to Gilabert and Lawford-Smith (Gilabert and Lawford-Smith, 2012), in general, a process or state of affairs is feasible when those who carry it can and have the ability to actually bring it about. They further defined feasibility as "about plausible counterfactual (and actual) futures" (Gilabert & Lawford-Smith, 2012 p. 810). Because of this temporal aspect, feasibility requires two elements which are momentum and inevitability to be able to reach desirable goal in the future. It is assumed that a state of affairs would not be feasible if it overlooks the momentum or inevitability of certain events that could lead to or enable its feasibility.

Aside from the theoretical definition above, the study of feasibility could refer to an analysis of possible solutions to a problem and a recommendation on the best alternative. From the study results, it can then be decided whether a process can be carried out by the system or can be structured more efficiently than the existing one (Kitnaes and Zingstra, 2010). There are several variations of feasibility study, for example:

- Legal feasibility: relates to legal requirements of the analysed system
- Economic feasibility: also known as cost-benefit analyses, aimed to determine the benefits and savings expected from the proposed system
- Schedule feasibility: assessment of the planning and time needed for the system to work in its entirety
- Technical feasibility: evaluates technical aspects of the system to be carried out effectively
- Operational feasibility: measures how well a proposed solution solves the identified problems, identifies opportunities and challenges, takes advantages of the identified opportunities and satisfies the identified needs and priorities in the performed analysis

This research is a not a feasibility study as implied in any of the above categories. Instead, it is a comparative study that aimed to assess the feasibility and justification of the subject of research,

which is MRV for developing countries, based on the circumstances and perspectives of two countries, China and Indonesia. In the case of this research, the identified problem is the assumed lack of capacity of developing countries to implement climate mitigation actions MRV requirements, thus lead to question whether it is feasible to do so. This research is analysing the governance at national level that includes for example the climate governance and capacity, existing monitoring system, the economic and political situation, and role of non-state actors in MRV implementation. This research also delved in the gaps, constraints, opportunities and challenges faced by China and Indonesia in implementing MRV. Feasibility is then valued from the actual circumstances in China and Indonesia, coalesced with the perspective of the interviewees from both countries.

Meanwhile, justification according to Merriam Webster dictionary means "1) the act, process or state of being justified; 2) the act or an instance of justifying and 3) something that justifies"[2]. The term 'justification' is usually linked to other related terms such as epistemic, knowledge, reliability, reasoning, truth and belief. Jarret Leplin in his book "A Theory of Epistemic Justification" (Leplin, 2009) divided justification into two categories: justification of a belief and justification of the believer holding the belief. The distinction between both categories is that in the first, justification of belief is independent of whether or not the belief is believed justifiably. In other words, the first category based justification on rationality, reliable belief-formation and knowledge-based and evidence-based reasoning.

This proposition is in line with Moser (Moser, 1985) who proposed the terms of epistemic justification which he described as "disinterested justification", as opposed to prudential justification (Moser, 1957 p.1). Thus, epistemic justification of a belief is knowledge-based, and does not depend on whether the person holds the belief believed it to be true or not. Epistemic justification could apply to both empirical and non-empirical beliefs, yet it requires certain observation or experiential evidence or good, logical reasoning.

As this research is analysing the perspective of two developing countries which based heavily on the view of experts and practitioners, one could argue that valuation of justification could be biased and dependent of the interviewee's opinion, interpretation and understanding of the matter. In order to maintain objectivity, this research developed a set of criteria and indicator as an instrument with which justification in being valued. This instrument is useful to provide "good and logical reasoning" of the perspectives. Additionally, this research will also looked at existing literature, documentation, data, and coverage in regards with the topic of MRV for developing countries as balancing sources to valuing the justification.

[2] www.merriam-webster.com/justification accessed on 09 December 2012 at 14.55

The criteria of justification in this research are based on the principles of the UNFCCC applied for developing country Parties, including –among others- voluntary principle (in taking mitigation actions), common but differentiated responsibility, and respective capability. The internal factors and external factors as categorised in Downie's theory also included here, which are the domestic groups' pressure, domestic policy incentives and international pressure as the internal factors; and national interest and expectation, and whether implementing MRV will help country to achieve its mitigation target. The external factors here is linked with country's vulnerability, in which it is assumed that country's mitigation target, in line with its development plan, is a way to reduce vulnerability.

2.2. Merging of the theories

The theories above are merged and linked to the findings gathered from preliminary study on MRV. From the findings, it was identified that at the international level, developing countries are taking high regards to the principles of the UNFCCC namely the common but differentiated responsibility (CBDR), voluntary nature in taking mitigation actions, and looking at the historical responsibility and respective capabilities of the countries. The implementation of MRV is also reliant on the decisions and agreements reached at the negotiation round, and the provisions which are supports provided from developed to developing countries to enable NAMAs.

While at national level, the circumstances of a country are affecting the policy-making process, on climate policy in general and on mitigation actions and MRV in particular. Climate governance includes policy/strategies, actions, capacity and role of private/non-state actors in shaping the policy. Environmental informational governance entails the situation of data systems and national constraints in economic, politic, institutional and cultural sectors that determined the information environment of a country. The circumstances also include internal and external factors based on Downie's theory, which are the interests and preferences of the governments of China and Indonesia in implementing MRV and the existence of domestic groups' pressure toward MRV as the internal factors, and vulnerability and other environmental problems as the external factors. Figure 5 below shows the merged theories and relations among them:

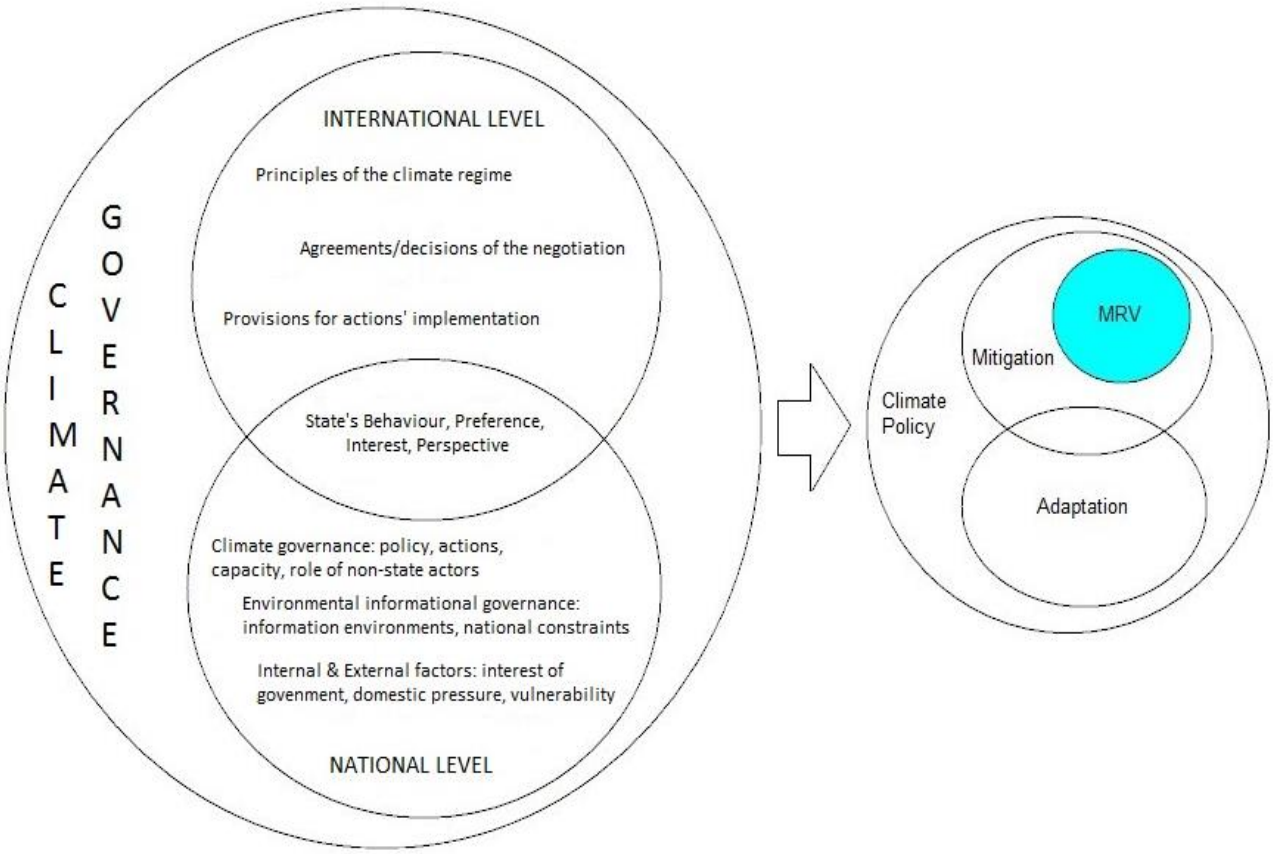

Figure 5. Relations of the theories utilized in this research

2.3. Application of the merged theories to this research

2.3.1. Criteria and indicators of assessment

To operationalize the theories, sets of criteria and indicators for feasibility and justification of implementing climate mitigation MRV for developing countries were developed. The criteria are taken from the variables of research as presented in Table 1, while the indicators will be used as basis for the evaluation of feasibility and justification.

To evaluate feasibility, the criteria for provisions are the guidelines, methodologies, framework and design of MRV for developing countries, and the supports to take NAMAs and its MRV in terms of finance, technology transfer and capacity building. Meanwhile at national level, criteria comprised of climate governance, environmental information governance and involvement of non-state actors in MRV. National constraints as part of environmental informational governance are given different section, since it is a significant aspect to be addressed in MRV implementation.

While for justification, the criteria encompass the principles and national interest in implementing MRV. The major interests or expectations from MRV implementation include to achieve national mitigation target, to get international acknowledgement on the actions taken and to get supports for further actions, and to achieve domestic incentives like improvement of existing monitoring system and to reduce climate vulnerability by taking mitigations actions. The criteria and indicators are shown in table 3 below:

Table 3. Criteria and indicators for Feasibility and Justification of MRV implementation

Feasibility					
International climate regime	Provisions for MRV		Exist	Not clear	No
		Guidelines for MRV			
		Framework/design of MRV			
		Supports availability to implement MRV			
National circum-stances	National governance		Good	Medium	Poor
		Climate governance			
		Environmental Informational Governance			
		Involvement of non-state actors			
	National constraints		High	Medium	Low
		Economic constraint			
		Political constraint			
		Organizational/Institutional constraint			
		Cultural/Interpretational constraint			
		Other gaps and challenges			
Justification					
International climate regime	Principles of the Convention		Just	Not sure	No
		Common but differentiated responsibility			
		Voluntary mitigation actions for developing countries			
		Align with national development priority and country's respective capability			
National circum-stances	National interest		Yes	Not clear	No
		Achieve national mitigation target			
		International acknowledgement and supports achieved			
		Domestic policy incentives			

2.3.2. Limitation in applying the merged theories

The merged theories along with the criteria and indicators were built based on the preliminary findings and literature study. During the data collection process, the criteria and indicators were being adjusted and refined. However, it is important to take into account that there are constraints on data collected in regards with accuracy of data, information disclosure, limitation

to access of data, and reliability of the data collected that are likely to be faced in research about developing countries.

On the data gathered from resource person interviews, there are limitations because of technicalities problems on the method of conducting interviews, which was done in various ways. Other limitations are due to the fact that many of the information on MRV are relatively new and untested, and it is changing swiftly since it is still an on going process. The resource persons and experts in the MRV are also quite exclusive, therefore the information gathered from the interviews are being cross-checked and elaborated with the data from secondary sources. Further explanation on this matter will be explained on the discussion in Chapter VI.

Chapter III

MRV negotiation at international level

3.1. Introduction

At the United Nations Conference on Environment and Development (or commonly known as Earth Summit) in Rio de Janeiro in 1992, a new convention on climate change was opened for signature. The United Nations Framework Convention on Climate Change (UNFCCC) entered into force in 1994 and since then, Parties to the Convention have met annually at the Conference of the Parties, or known as the COP (Depledge et al., 2005).The ultimate objective of the Convention is to "achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system"[3].

The Kyoto Protocol, an international treaty linked to the Convention, was adopted in December 1997 and entered into force on February 2005. The Protocol commits industrialized countries to reduce their greenhouse gases emissions through measures at national scale. The target of emission reduction is amounted to an average of five per cent against 1990 levels over the five-year period of 2008-2012. Under the Treaty, countries must meet their targets primarily through national measures. However, the Kyoto Protocol offered additional means of meeting the targets by way of three market-based mechanisms, namely emissions trading – known as "the carbon market", clean development mechanism (CDM) and joint implementation (JI)[4].

With the first round of the protocol has expired by the end of 2012, Parties to the UNFCCC are establishing ways to incorporate a wider range of mitigation actions and emission reduction commitments from a larger number of countries. Along with that, the procedures for overseeing progress in the implementation of the post-2012 actions, that include national reports, inventories and MRV, need to be enhanced.

This chapter presents an exhaustive explanation of climate mitigation actions MRV for developing countries in the international climate negotiations. MRV is analysed as part of mitigation actions or NAMAs for developing countries, and in a broader context of national low emission development strategy (LEDS). The analysis also includes the timeline of MRV, provisions of MRV, the comparison with MRV for developed country Parties, and other MRV-related aspects that are being discussed and negotiated in the climate regime. But before the

[3] http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf accessed on 15-03-2013 at 10:17.
[4] http://unfccc.int/kyoto_protocol/items/2830.php accessed on 19-3-2013 at 10:32.

analysis, the next section will present the basic principles of the climate change cooperation in general, which also served as the basis of countries mitigation actions and MRV in particular.

3.1.1. Basic Principles of the Convention

The cooperation of countries of the UNFCCC is based on certain principles that are established in the text of The Convention itself. Despite the objective of the Convention that has been mentioned earlier, the principles clearly highlighted differentiations on the obligations, requirements, commitments and expected actions of developed and developing countries. They are as follows[5]:

- Parties should protect the climate system on the basis of *equity* and *in accordance with their common but differentiated responsibilities and respective capabilities*, taking into account their specific national and regional development priorities, objectives and circumstances.
- Accordingly and also referring to the principle of *historical responsibility* that implies the weighing of historical emission distinctively between the global north and the global south[6], developed countries should take the lead in combating climate change and its adverse effects.
- The specific needs and special circumstances of developing country Parties, especially those who are particularly vulnerable to the adverse effects of climate change, should be given full consideration.
- The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention, related to financial resources and transfer of technology, and will take fully into account that economic and social development and poverty eradication are the priorities of the developing countries.
- Developing country Parties may, on a *voluntary basis*, propose projects for financing, including specific technologies, materials, equipment, techniques or practices that would be needed to implements such projects, along with the estimation of cost of emission reduction and the consequent benefits.

[5] Summarized from The Convention of the UNFCCC http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf accessed on 15-03-2013 at 10:17

[6] http://pdf.wri.org/navigating_numbers_chapter6.pdf accessed on 22-02-2013 at 19:21

These principles recognised that an equitable and effective global agreement depends on a set of variables that differ between developed and developing countries, based on factors like the contribution to climate change in the past and the ability to commit financial resources to take actions. Under the Kyoto Protocol, these principles have manifested in the distinctions between Annex I countries (that comprised of most of the OECD countries and eastern European countries) which have legally binding emission limits, and non-Annex I countries which have non-binding responsibilities.

The principles above elucidate that although all countries shares the responsibility to reduce emissions, the obligation for developing countries is delayed and conditional on the actions of developed countries, and moreover, on the support provided from developed countries to developing countries. Developed country Parties should not shy from their obligations and instead, due to their respective capabilities, must take the lead and demonstrate willingness to commit to a stringent emission reduction target. That show of good faith will restore trust and build confidence in further global cooperation in climate change, which are essential ingredients to achieve a legally binding agreement.

The viewpoints as implied in those principles are commonly adopted by developing country Parties. Yet there exist huge discrepancies within developing countries itself that made one so distinct from another in terms of capacity to tackle and vulnerability toward adverse effects of climate change. The gap is extremely pronounced for example between China and Congo, or between the Arab countries and Small Island states. For this reason, despite the principles above, developed countries urged and rallied major economy developing countries to share more responsibilities in mitigating climate change. Both the US and the EU have insisted that any new legally binding agreement would need to contain commitments for major emerging economies, while it could allow for differentiated responsibilities with regard to the contents of those commitments (Werksman, 2011).

3.1.2. LEDS and NAMAs

The Fourth Assessment Report of the International Panel of Climate Change (IPCC) showed that between the year 1970 and 2004, global emissions of the greenhouse gases, weighted by their global warming potential, have increased by 70%. The largest growth in global GHG emissions has come from the energy supply sector, followed by transport sector, industry sector, land use, land use change and forestry (LULUCF), agriculture and building sector (Parry et al., 2007).

In order to cope with global warming and climate change, mitigation and adaptation actions need to be taken. Mitigation means adopting technological change and substitution and

implementing policies to reduce GHG emissions and enhance sinks, whereas adaptation refers to initiatives and measures adopted to reduce vulnerability of natural and human systems against climate change effects. These two types of policy actions can be complementary, substitutable, competitive or independent of each other. Adaptation actions will not be assessed in this research. However, certain aspects of adaptation actions that are related to MRV will be incorporated accordingly.

While the negotiations proceed to establishing a global mitigation architecture, countries at national level must already taking steps toward developing and enabling implementation of this architecture. However, it is not an easy task for governments of developing countries, who are facing the challenge to consider global requirements while at the same time addressing national appropriateness of such steps. This translates into the need of comprehensive national and regional models for low carbon strategies, sustainable development and green growth, that are still being developed.

Cancun Agreements encouraged developing countries "to develop low-carbon development strategies or plans in the context of sustainable development" (UNFCCC, 2010). Low Emission Development Strategy is a nationally comprehensive long-term strategy which aims at decoupling economic growth and social development from GHG emissions growth. The goal of LEDS is to make national development climate-compatible. Although there are other coinages for the strategy, namely Low Carbon Development Strategy, Climate-compatible Development Plan or National Climate Change Plan, but the aims, purposes and basic elements of these strategies are similar. Figure 6 below shows the position of LEDs between sustainable development and emission reduction process:

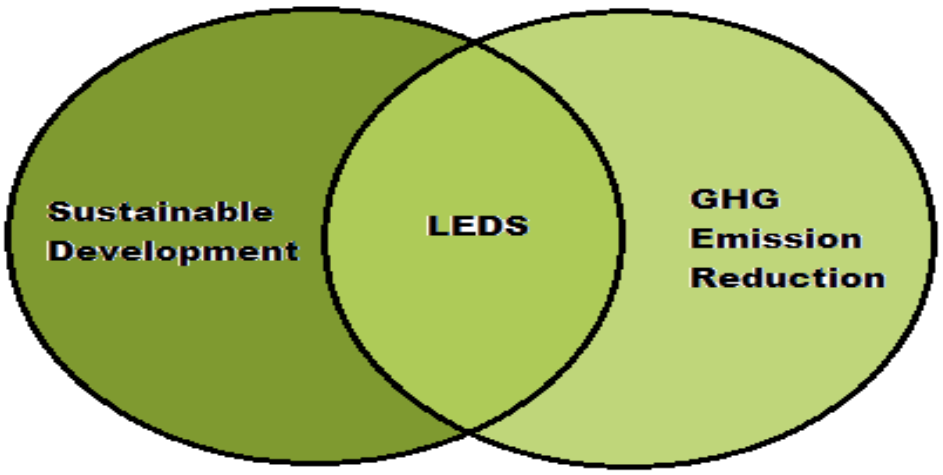

Figure 6. Low Emission Development Strategy

NAMAs, which stands for Nationally Appropriate Mitigation Actions, are measures adopted by countries to mitigate climate change. NAMAs are taken by developing countries on a voluntary basis; within the context of sustainable, low emission development path; supported and enabled by technology, financing and capacity-building; and monitored in an MRV manner. NAMAs may include projects, plans, policies or strategies for GHG emissions reduction at national or sub-national level, and are selected and administrated based on country's national priorities including long-term national development strategy and plan. Thus NAMAs contribute to the implementation of LEDS. Figure 7 shows the scope of NAMAs:

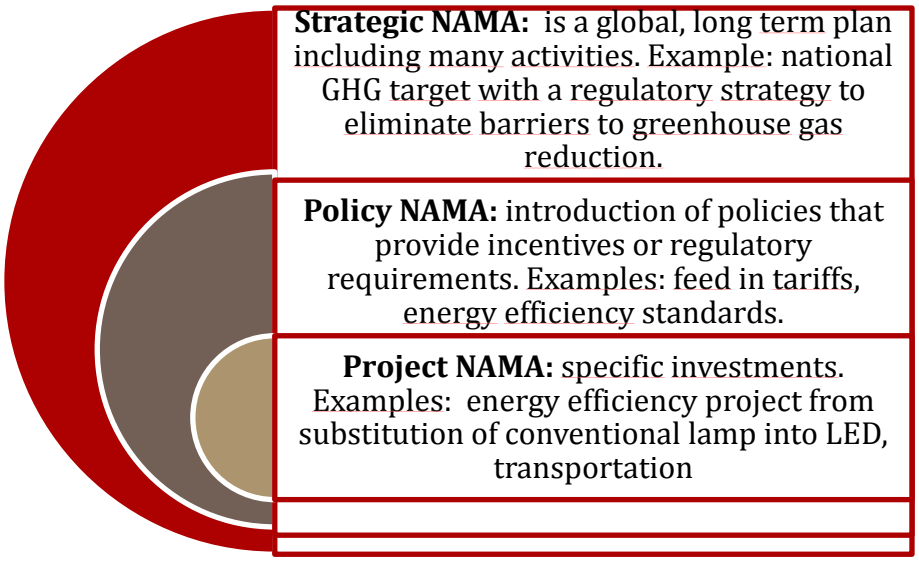

Figure 7. Scope of NAMAs (Michaelowa, 2013)

Since 2007, when NAMA concept was formally mentioned in the Bali Action Plan for the first time in international climate negotiation, it has developed its shape gradually. Many details are yet to be decided and agreed upon by the international community, and further development is expected in the upcoming rounds of negotiation. The Copenhagen Accord in 2009 requested developing countries to submit their NAMAs to the UNFCCC Secretariat. As of recently, there are 64 NAMAs activities in 34 developing countries[7], and some of the activities has been registered to the UNFCCC NAMAs registry prototype. However, the scope and contents of these NAMAs are diverse and significantly vary.

A distinction is made between 'unilateral NAMAs' that are adopted on a voluntary basis and independently carried and funded by developing countries, and 'internationally supported NAMAs' which are additional efforts that developing country are willing to take on the condition that international support is provided. This support can either be provided through direct

[7] http://www.nama-database.org/ accessed on 5 July 2013 at 22.30

support from an Annex I country or co-funded through carbon offset credits mechanism, which lead to third category of NAMAs, the 'credit-generating NAMAs' (Winkelman et al., 2011) . This last category refers to actions that produce credits for sale in the global carbon market to offset Annex I countries GHGs. The concept of carbon markets in financing NAMAs is currently under discussion and has not yet been formally established. Figure 8 below shows the two NAMAs categories:

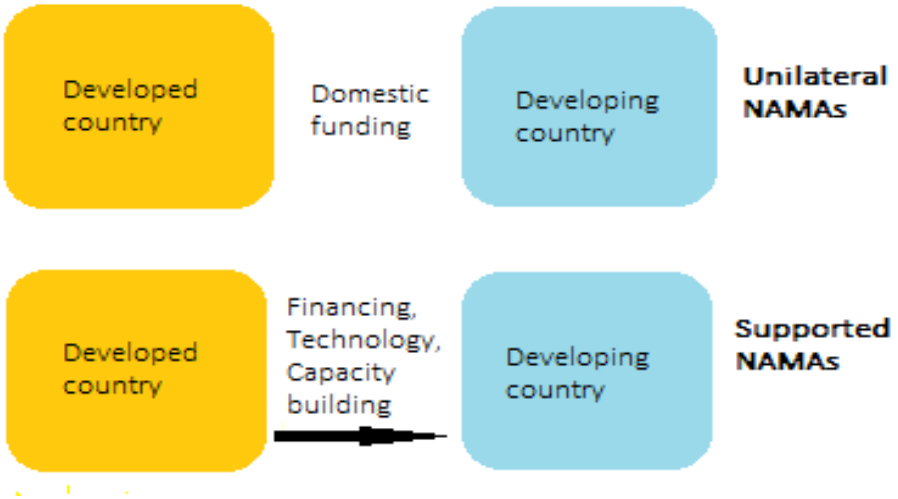

Figure 8. NAMAs category

The Cancun Agreements further decided the establishment of the NAMA registry with the purpose to record NAMAs seeking international support, to facilitate the matching of finance, technology and capacity-building support with these actions, and to facilitate international recognition of other NAMAs. The NAMA registry contains detailed information on NAMAs submitted by developing countries as well as information on support developed countries are willing to provide. The prototype of the registry consists of the following parts[8]:

1. NAMA seeking support for preparation,
2. NAMA seeking support for implementation,
3. Other NAMAs for international recognition, and
4. Information on support for NAMAs.

From the explanation above, the interlinkages among LEDS, NAMAs and MRV could be summed up where LEDS can be overall framework for the development of NAMAs, MRV of NAMAs is critical to generate transparency and effectiveness of the policy-making process. Figure 9 below shows the interlinkages:

[8] http://unfccc.int/cooperation_support/nama/items/6945.php accessed on 27-02-2013 at 16:08

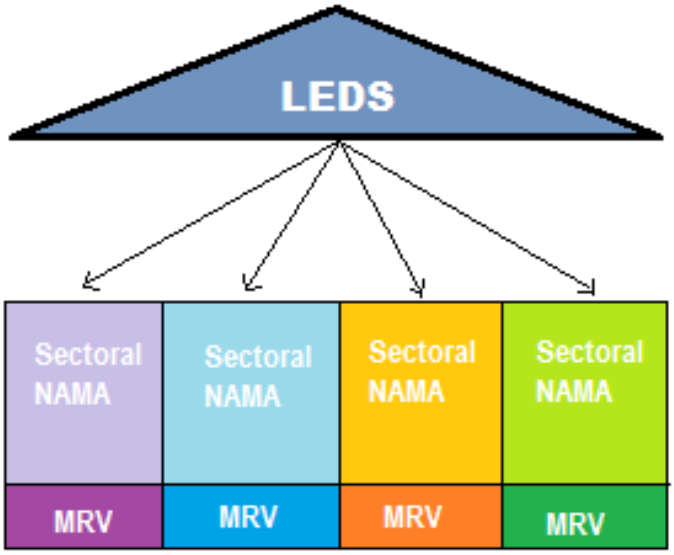

Figure 9. Interlinkages of LEDS, NAMA and MRV

3.1.3. National Communications, BUR and GHG Inventory

Transparent, accurate, consistent and internationally comparable data on GHG emissions is essential for the global community to take the most appropriate action to mitigate climate change, and ultimately to achieve the objective of the Convention. Communicating these data and other relevant information on the most effective ways to reduce emissions and adapt to the adverse effects of climate change also shares lessons learned and thus contributes towards global sustainable development. In the international climate regime, these communications are manifested in forms of country reports.

Parties of the UNFCCC are required to submit national reports on implementation or on the steps they are taking to enable the implementation of the Convention. The core elements of these reports for both developed and developing countries (hereinafter also termed as Annex I and non-Annex I countries) are information on emissions and removals of greenhouse gases and details of the activities that has been undertaken to implement the Convention. Yet the reports also contain information on national circumstances, vulnerability assessment, financial resources, development and transfer of technology and education, training and public awareness. Moreover, the reports from Annex I Parties must include additional information on policies and measures. In summary, the reporting and review requirements under the Convention encompass the following types[9]:

- National Communications: periodic submissions by developed and developing countries covering all aspects of implementation. NAMAs are included in this report.

[9] http://unfccc.int/national_reports/items/1408.php accessed on 05-03-2013 at 10:11

- Greenhouse Gas Inventories: annual submission by developed countries on greenhouse gas emissions and removals.
- National Adaptation Programs of Actions: submissions by least-developed countries on their needs and priorities for adaptation.

The required contents of national communications and the timetable for their submission are different for Annex I and non-Annex I Parties. Annex I Parties are required to submit information on their national inventories annually, and to submit national communications every four to five years. Annex I Parties that have ratified the Kyoto Protocol must include supplementary information in their national communications and their annual inventories of emissions and removals of GHGs to demonstrate compliance with the Protocol's commitments.

In its 17th meeting in Durban, the Conference of Parties has decided that developed country Parties should enhance reporting in national communication (NC) and submit biennial update report (BUR) which outline progress in achieving emission reductions and the provision of financial, technology and capacity-building support to non-Annex I Parties, building on existing reporting and review guidelines, processes and experiences. It also established new reviewing process which is international assessment and review (IAR) under the Subsidiary Body for Implementation (SBI) for developed country Parties that aims to promote the comparability of efforts among all developed country Parties with regard to their quantified economy-wide emission limitation and reduction targets.

Initially, there are no fixed dates for the submission of national communications of non-Annex I Parties, although these documents should be submitted within four years of the initial disbursement of financial resources to assist them in preparing their national communications. Developing countries were not obliged to submit a national GHG inventory, but the summary of their emissions are included within their national communications. But as part of the Durban decisions, developing countries have agreed to a more stringent reporting of NC and BUR, which include (Boer, et al, 2012):

- National circumstances and institutional arrangements for the preparation of National Communications and BUR on a continuous basis;
- Updates of national GHG inventories including a national inventory report;
- Information on mitigation actions including a description, analysis of the impacts and associated methodologies and assumptions, progress in implementation and information on domestic MRV; and
- Needs and support received related to Funding, Technology and Capacity Building.

Developing countries will have to submit the national communications every four years and the update reports every two years. The deadline for the first biennial update report is December 2014, while the least developed country (LDCs) Parties and Small Island Developing States (SIDS) may submit biennial update reports at their discretion. Developing countries' BUR will be reviewed through a process of international consultation and analysis (ICA) which is composed of two steps: 1) a technical analysis by a team of technical experts in consultation with the Party concerned; and 2) a facilitative sharing of views under the SBI open to all Parties (P3)[10].

MRV in the context of mitigation assessment requires credible baseline/reference emission level. Developing baseline is a complex issue, since it involves many factors (parameters/variables, data availability and reliability, national/regional policies) and actors at national, local and at sectoral level. A baseline is a non-intervention scenario under the condition of the absence of explicit mitigation policies, which is used as a reference in the analysis of intervention scenarios. A baseline should not be a simple extrapolation of current trends, but should consider the likely future evolution of activities that effect GHG sources and sinks in which a long-term simulation is required. GHG Inventory is one of the key information to be reported in Bur and NC to indicate the level of GHG emissions/removals.

3.2. Timeline of MRV agreements and decisions

3.2.1. Bali Action Plan 2007

The concept of MRV was also first introduced in the *Bali Action Plan* (BAP), a document adopted in 2007 at the Conference of the Parties 13 (COP 13) of the UNFCCC in Bali, Indonesia. The BAP stated that countries will look up to long-term cooperative action (LCA) for the enhancement of national and international mitigation actions with provenance of MRVed NAMAs by both developed and developing countries. The distinctions made between both groups of countries were that the mitigation actions taken by developing countries are within the context of sustainable development, and will be supported in terms of technology, finance and capacity building.

In summary, the BAP foresaw the necessity for:

- Developed countries to take MRV of nationally appropriate mitigation commitments (NAMACs), including quantified emission limitation and reduction objectives in a consistent and comparable format of reporting,

[10] The information with reference code P is acquired from experts/resource persons' interviews. For the list of interviewees, see appendix IV.

- Developing countries to take MRV of nationally appropriate mitigation actions (NAMAs) in the context of sustainable development, supported and enabled by technology, financing and capacity building, both in terms of actions and means of implementation
- MRV of financial and technical support and policy approaches and positive incentives on issues relating to REDD+ in developing countries;

The excerpt of the Bali Action Plan or Decision 1/CP.13 of the Conference of Parties (COP) on its thirteenth session in Bali is shown in box 1 below:

Box 1: Text from The Bali Action Plan

Bali Action Plan

1. *Decides* to launch a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its fifteenth session, by addressing, inter alia:
   a) A shared vision for long-term cooperative action, including a long-term global goal for emission reductions, to achieve the ultimate objective of the Convention, in accordance with the provisions and principles of the Convention, in particular the principle of common but differentiated responsibilities and respective capabilities, and taking into account social and economic conditions and other relevant factors;
   b) Enhanced national/international action on mitigation of climate change, including, inter alia, consideration of:
      i. Measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives, by all developed country Parties, while ensuring the comparability of efforts among them, taking into account differences in their national circumstances;
      ii. Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner.

3.2.2. Copenhagen Accord 2009

The concept of MRV was then put forward at COP 15 in Copenhagen where countries agreed that mitigation actions taken by developing country Parties will be subject to their *domestic* measurement, reporting and verification, which results will be reported through the national communications every two years. The mitigation actions that seek international support will be subject to *international* measurement, reporting and verification in accordance to guidelines adopted by the Conference of the Parties. Box 2 below shows the excerpt of the Accord:

Box 2: Text from The Copenhagen Accord

Copenhagen Accord

5. Non-Annex I Parties to the Convention will implement mitigation actions, including those to be submitted to the secretariat by non-Annex I Parties in the format given in Appendix II by 31 January 2010, for compilation in an INF document, consistent with Article 4.1 and Article 4.7 and in the context of sustainable development. Least developed countries and small island developing States may undertake actions voluntarily and on the basis of support. Mitigation actions subsequently taken and envisaged by Non-Annex I Parties, including national inventory reports, shall be communicated through national communications consistent with Article 12.1(b) every two years on the basis of guidelines to be adopted by the Conference of the Parties. Those mitigation actions in national communications or otherwise communicated to the Secretariat will be added to the list in appendix II. Mitigation actions taken by Non-Annex I Parties will be subject to their domestic measurement, reporting and verification the result of which will be reported through their national communications every two years. Non-Annex I Parties will communicate information on the implementation of their actions through National Communications, with provisions for international consultations and analysis under clearly defined guidelines that will ensure that national sovereignty is respected. Nationally appropriate mitigation actions seeking international support will be recorded in a registry along with relevant technology, finance and capacity building support. Those actions supported will be added to the list in appendix II. These supported nationally appropriate mitigation actions will be subject to international measurement, reporting and verification in accordance with guidelines adopted by the Conference of the Parties.

8. Scaled up, new and additional, predictable and adequate funding as well as improved access shall be provided to developing countries, in accordance with the relevant provisions of the Convention, to enable and support enhanced action on mitigation, including substantial finance to reduce emissions from deforestation and forest degradation (REDD-plus), adaptation, technology development and transfer and capacity-building, for enhanced implementation of the Convention. The collective commitment by developed countries is to provide new and additional resources, including forestry and investments through international institutions, approaching USD 30 billion for the period 2010–2012 with balanced allocation between adaptation and mitigation. Funding for adaptation will be prioritized for the most vulnerable developing countries, such as the least developed countries, small island developing States and Africa. In the context of meaningful mitigation actions and transparency on implementation, developed countries commit to a goal of mobilizing jointly USD 100 billion dollars a year by 2020 to address the needs of developing countries. This funding will come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance. New multilateral funding for adaptation will be delivered through effective and efficient fund arrangements, with a governance structure providing for equal representation of developed and developing countries. A significant portion of such funding should flow through the Copenhagen Green Climate Fund.

10. We decide that the Copenhagen Green Climate Fund shall be established as an operating entity of the financial mechanism of the Convention to support projects, programme, policies and other activities in developing countries related to mitigation including REDD-plus, adaptation, capacity building, technology development and transfer.

Another significant result of the Copenhagen meeting was the decision regarding the financial support. The Accord decided to establish scaled-up, new and additional, predictable and adequate funding to enable and support mitigation actions by developing countries including REDD+, adaptation, technology development and transfer, and capacity building. This funding, to be mobilized jointly by developed countries from public, private, multilateral, bilateral and alternative resources, is amounted to USD 30 billion for the period of 2010-2012, and to 100 billion a year by 2020. A Green Climate Fund shall be established as an operating entity of the

financial mechanism of the Convention, and a significant portion of the said funding should flow through the Green Climate Fund.

However, the Copenhagen Accord was not the usual type of agreement made by COP neither in its way to be achieved nor on its acceptance by Parties. As countries were unable to outline even the major decisions that they needed to make, the negotiation was resolved by only a handful of head of states that convened in a high level meeting. The outcome of the meeting was presented to the forum, and unlike previous decisions that are accepted by unanimous consensus of the delegates, Copenhagen Accord was only "taken note" by the COP (Bratasida, 2011).

This process has left confusion and legal questions surrounding the Accord. The Copenhagen meeting was accounted as one of the major setbacks in international climate negotiation, since instead of resulting in a legally binding agreement as has been expected, it produced a document with a nature of lesser significance. There was also a shift where targets and actions are no longer negotiated but merely pledged, thus removing one of the main functions of an international agreement and would be dependent on national political circumstances.

3.2.3. Cancun Agreements 2010

Unlike the Copenhagen Accord, the Cancun Agreements is a decision of the COP that was adopted by majority of Parties, albeit not a legally binding one. It created a new standard for transparency in which all major economies will report on progress towards achieving their climate targets and actions, and will submit this progress to a review. Cancun Agreements provided new provisions for developed countries that did not exist under previous UNFCCC agreements, which are the development of common reporting formats for national communications, more frequent reporting with the submission of biennial reports, and a process of International Assessment and Review (IAR) of emissions and removals to track developed countries performances toward meeting targets.

Developing countries are also subject to new transparency provisions which include more frequent reporting through biennial update reports which will be verified by a process of International Consultation and Analysis (ICA), and to have their mitigation actions that seek international support registered through the registry prototype. Taken on from Copenhagen Accord, Cancun Agreement decided that internationally supported mitigation actions will be measured, reported and verified domestically and will be subject to international measurement,

reporting and verification while domestically supported mitigation actions will be measured, reported and verified domestically. Box 3 below shows the excerpt of the Cancun Agreements:

Box 3. Text from the Cancun Agreements

Cancun Agreements

60. *Decides* to enhance reporting in national communications, including inventories, from Parties not included in Annex I to the Convention on mitigation actions and their effects, and support received, with additional flexibility to be given to the least developed country Parties and small island developing States:
    a. The content and frequency of national communications from Parties not included in Annex I to the Convention will not be more onerous than that for Parties included in Annex I to the Convention;
    b. Parties not included in Annex I to the Convention should submit their national communications to the Conference of the Parties, in accordance with Article 12, paragraph 1, of the Convention, every four years or in accordance with any further decisions on frequency by the Conference of the Parties, taking into account a differentiated timetable and the prompt provision of financial resources to cover the agreed full costs incurred by Parties not included in Annex I to the Convention in preparing their national communications;
    c. Developing countries, consistent with their capabilities and the level of support provided for reporting, should also submit biennial update reports containing updates of national greenhouse gas inventories, including a national inventory report and information on mitigation actions, needs and support received;
61. *Also decides* that internationally supported mitigation actions will be measured, reported and verified domestically and will be subject to international measurement, reporting and verification in accordance with guidelines to be developed under the Convention;
62. *Further decides* that domestically supported mitigation actions will be measured, reported and verified domestically in accordance with general guidelines to be developed under the Convention;
63. *Decides* to conduct international consultations and analysis of biennial reports under the Subsidiary Body for Implementation, in a manner that is non-intrusive, non-punitive and respectful of national sovereignty; the international consultations and analysis will aim to increase transparency of mitigation actions and their effects, through analysis by technical experts in consultation with the Party concerned and through a facilitative sharing of views, and will result in a summary report;
64. *Also decides* that information considered should include the national greenhouse gas inventory report, information on mitigation actions, including a description, analysis of the impacts and associated methodologies and assumptions, progress in implementation and information on domestic measurement, reporting and verification, and support received; discussion about the appropriateness of such domestic policies and measures is not part of the process; discussions should be intended to provide transparency of information related to unsupported actions;

3.2.4. Durban Platform 2011

COP 17 in Durban, South Africa, resulted in "Durban Platform for enhance actions" to negotiate the long-term future of the regime, the second commitment period of the Kyoto Protocol and an array of decisions to implement the Cancun Agreements. The Platform seeks to establish the future direction of the climate regime by initiating a new round of negotiations to be concluded by 2015 and operationalized by 2020. The Platform ultimately brings all Parties from both developed and developing countries onto one track of negotiation, and provides for reintegration under the same agreement for the developed countries that have remained outside Kyoto Protocol or have withdrawn from it.

Parties were looking up to make the MRV system as agreed in the Cancun Agreement operationalizable. On reporting and review issue, guidelines were adopted that are going to be used by countries to develop the first biennial reports. The modalities to review these reports through IAR and ICA were also set in Durban, although they lack clarification regarding the composition of review team, authority of the review team to make recommendations, compliance procedure and involvement of observer in the process to heighten the transparency and effectiveness of the process.

Regarding the national pledges, there need to be more detail and clarity of the underlying methodologies and assumptions that are required from Annex I countries, and on the kind of information that non-Annex I countries are invited to provide. It was also discussed whether a common accounting system for emission reduction and enhanced removals would be applied for both group of countries. In summary, the discussion centred on how to maintain environmental integrity while preserving flexibility for Parties. Box 4 shows the excerpts of Durban text:

Box 4. Text from The Durban Platform

Durban Platform
On establishment objective of ADP:
5. *Also decides* that the Ad Hoc Working Group on the Durban Platform for Enhanced Action shall plan its work in the first half of 2012, including, inter alia, on mitigation, adaptation, finance, technology development and transfer, transparency of action and support, and capacity-building, drawing upon submissions from Parties and relevant technical, social and economic information and expertise;

On enhanced actions on mitigation:
Nationally appropriate mitigation commitments or actions by developed country Parties
5. *Decides* to continue in 2012 the process of clarifying the developed country Parties' quantified economy-wide emission reduction targets contained in document FCCC/SB/2011/INF.1/Rev.1, with the objective of understanding the assumptions and conditions related to the individual targets, in particular in relation to the base year, global warming potential values, coverage of gases, coverage of sectors, expected emission reductions, and the role of land use, land-use change and forestry, and carbon credits from market-based mechanisms, and associated assumptions and conditions related to the ambition of the pledges; this process shall include the following:
(a) Submission of relevant information by developed country Parties, using a common template, to the secretariat by 5 March 2012 to be compiled into a miscellaneous document;
(b) In-session workshops;
(c) An update of document FCCC/TP/2011/1;
UNFCCC biennial reporting guidelines for developed country Parties
12. *Adopts* the guidelines contained in annex I on the preparation of biennial reports by developed country Parties (the "UNFCCC biennial reporting guidelines for developed country Parties");
13. *Decides* that developed country Parties shall use the "UNFCCC biennial reporting guidelines for developed country Parties" for the preparation of their first biennial reports, taking into account their national circumstances, and shall submit their first biennial reports to the secretariat by 1 January 2014, and their second and subsequent biennial reports two years after the due date of a full national communication (i.e. in 2016, 2020);

14. *Also decides* that Annex I Parties shall submit a full national communication every four years, noting that the next due date after adoption of this decision is 1 January 2014 according to decision 9/CP.16;
15. *Further decides* that in the years when the full national communications are submitted, developed country Parties should present the biennial reports as an annex to the national communications or as a separate report;

Nationally appropriate mitigation actions by developing country Parties

32. *Encourages* developing country Parties that are yet to submit information on nationally appropriate mitigation actions pursuant to decision 1/CP.16, paragraph 50, to do so, noting the need to extend flexibility to small island developing States and the least developed country Parties;

33. *Decides* to continue, in 2012, workshops, in a structured manner, to further the understanding of the diversity of mitigation actions as communicated and contained in document FCCC/AWGLCA/2011/INF.1, underlying assumptions and any support needed for the implementation of these actions, noting different national circumstances and the respective capabilities of developing country Parties;

34. *Invites* developing country Parties, with a view to providing input to the process referred to in paragraph 33 above, to submit, subject to availability, more information relating to nationally appropriate mitigation actions, including underlying assumptions and methodologies, sectors and gases covered, global warming potential values used, support needs for the implementation of nationally appropriate mitigation actions and estimated mitigation outcomes;

UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention

41. *Decides*:

(a) That non-Annex I Parties, consistent with their capabilities and the level of support provided for reporting, should submit their first biennial update report by December 2014; the least developed country Parties and small island developing States may submit biennial update reports at their discretion;

(b) That in using the Guidelines, non-Annex I Parties should take into account their development priorities, objectives, capacities and national circumstances;

(c) That the Guidelines should be used as a basis to provide guidance to an operating entity of the financial mechanism for funding the preparation of biennial update reports from non-Annex I Parties and, in the case of the first biennial update report, to the Global Environment Facility;

(d) To urge non-Annex I Parties to submit their requests to the Global Environment Facility for support, in a timely manner;

(e) That enhanced support for the preparation of biennial update reports should be ensured by developed country Parties and other developed Parties included in Annex II to the Convention by means of resources, in accordance with Article 4, paragraph 3, of the Convention, on the basis of agreed full-cost funding;

(f) That non-Annex I Parties shall submit a biennial update report every two years, either as a summary of parts of their national communication in the year in which the national communication is submitted or as a stand-alone update report; the least developed country Parties and small island developing States may submit biennial update reports at their discretion;

(g) That the first biennial update report submitted by non-Annex I Parties shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and that subsequent biennial update reports shall cover a calendar year that does not precede the submission date by more than four years;

42. *Also decides* that these guidelines should be reviewed and revised as appropriate, in accordance with decisions of the Conference of the Parties;

43. *Requests* the secretariat to facilitate assistance to non-Annex I Parties, on request, in the preparation of their biennial update reports, in accordance with Article 8, paragraph 2(c), of the Convention;

44. *Urges* and requests the Global Environment Facility to make available support to non-Annex I Parties preparing their first biennial update reports as early as possible in 2012 and on the basis of agreed full-cost funding;

3.3. Developed countries MRV system and provisions of Developing Countries MRV

You can't manage what you can't measure. This is the reason of why it is important to track countries' individual and aggregate progress in reducing greenhouse gas (GHG) emissions. In broad sense, MRV can help assess the world's progress toward limiting the increase in global temperature to below 2 degree Celsius, which is the goal agreed to by Parties at COP 16 in Cancun, as compared to pre-industrial level. It can also promote trust that all countries are doing what they pledged they would do. A system of reporting and reviewing can facilitate

learning and implementation by identifying which policies work and which don't, and what type of support that are needed by developing countries in order to develop and implement climate strategies.

The previous sections showed the mechanism of national reporting and its relations to LEDS, NAMAs, GHG inventory and MRV. The next section will present the MRV system of European Union that could be used as an example or an already running system. Afterward, the provision for MRV based on the current update on MRV in the negotiation is discussed.

3.3.1. Developed countries MRV: an example of a running system

In this section, the MRV system of European Union is used as an example of how developed countries implement the obligation of the Convention. The EU views that the role of MRV in international setting should be to build trust, to track mitigation actions and the results, to provide recognition of Parties' actions, to assess the need for and provision of support for mitigation and to identify and share best practice and enable improvements (Kitou, 2010).

MRV is not a new concept, since basically it means to have a system in place that allows for monitoring implementation of an action and to measure its result, to report on progress in implementation and on any results achieved thus far, and to verify at the end whether all went according to plan. If it did not, MRV could identify in which areas that actions needed to be strengthen of fixed, identify alternative of ways and paths, so that it makes possible early adjustment of the implementation plan.

It is acknowledged that establishing robust MRV system needs significant cost and effort in a short term if compared to a status quo. But establishing MRV system will bring more effective and reliable data and information, comparability of the information provided, and increasing transparency that will benefit the whole process. In a long term, MRV would improve policy making by implementing cost-efficient policies and measures, since it creates standardized reporting with higher consistency and credibility.

The bases of the establishment of EU MRV system are The Marrakech Accords, The Kyoto Protocol and IPCC Guidelines. While EU's own legal basis are Decision no 280/2004/EC of The European Parliament and of The Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol, and Commission Decision of 10 February 2005 laying down rules implementing Decision No

280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol[11].

EU decided to establish MRV system because institutionalization of MRV can ensure that all resource requirements are considered and properly accounted for in advance, and necessary mechanisms are in place to address all issues that arise on a continuous and systematic way rather than on an ad-hoc basis. The steps that were taken to build EU MRV system were as follow:

- Assessed data and information needs (strategy, action, inventory, national communication)
- Identified key stakeholders and data providers
- Assessed availability and timing of data and information
- Mapped out existing flows of data and information versus desirable flow of data and information (based on particular outcome to be achieved)
- Communicated on needs with stakeholders and data providers and coordinate outputs
- Formalized relationships and links (law, regulation, contractual arrangements, others)
- Communicated outputs with all involved
- Recognise good team players and identify "laggers"

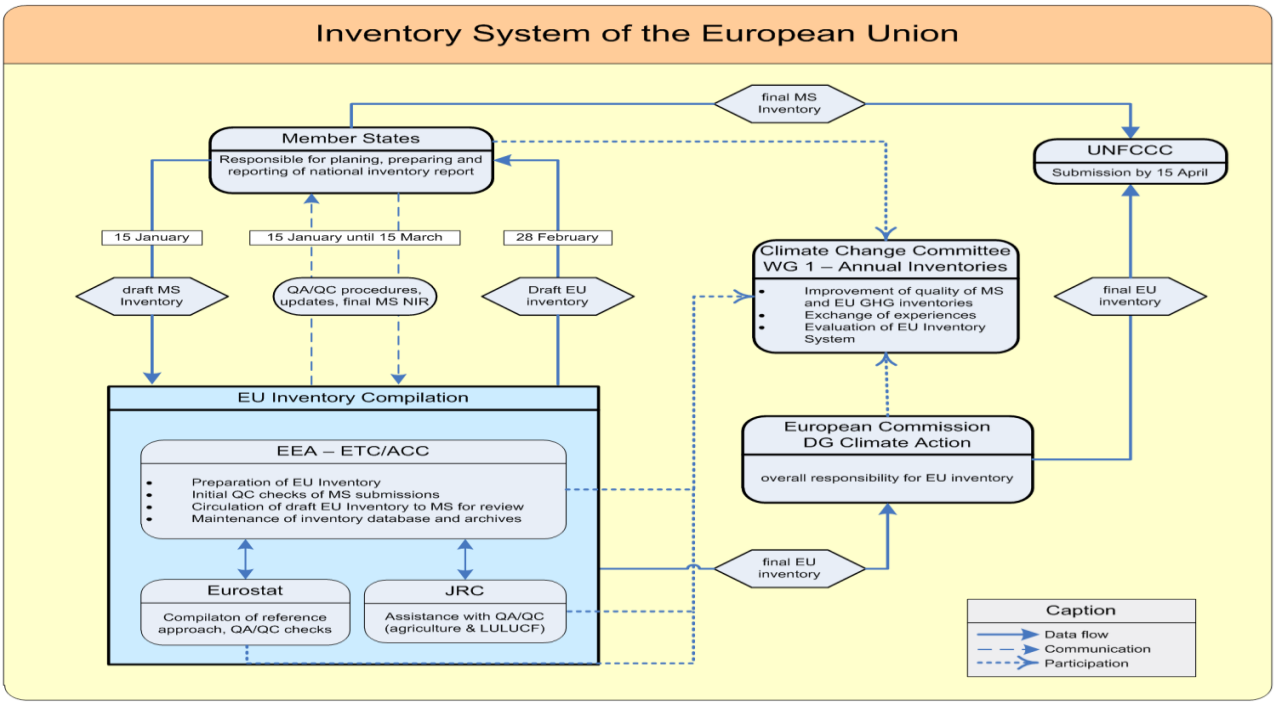

Figure 10. EU's Inventory system (Kitou, 2010)

[11] http://eur-lex.europa.eu accessed on 23-01-2013 at 15:03.

Figure 10 above shows the Inventory System of the EU. The outputs of MRV are in the forms of progress reports to Parliament and Council, trends and projections reports, annual inventories, press releases which are publicly available on the website of EU. Annual assessment are made of the progress of the European Community (EC) and its Member States (MS) in regards with annual emissions and progress in Community policies and measures and information submitted by MS. Biennial assessment was also made of projected progress of the Community and its MS towards fulfilling their Kyoto commitments that include projected emissions and removals, and policies and measures. Lastly, annual progress evaluation report was made to the European Parliament and the Council.

3.3.2. Current update of the negotiation on MRV: provisions for developing countries

The agreement reached in Durban marked an important milestone by agreeing on a set of guidelines for MRV, which were provided by the Subsidiary Body for Scientific and Technical Advice (SBSTA). The latest COP 18 in Doha, Qatar, however, has left some issues unresolved. On the reporting issue, countries managed to adopt common reporting format for Annex I countries. Nonetheless, the format does not cover emission allowances issued from market mechanism outside of the UNFCCC framework such as bilateral offset mechanism (which commonly involved non-Annex I counterpart) and sectoral crediting mechanism.

Regarding guidelines, there are general guidelines related to the preparation and development of NCs and BUR, GHG inventory and also the financing mechanism for these process. Guidelines for MRV is only on verification that will be under the consultation and analysis (ICA) for developing countries and review (IAR) for developed countries. There were propositions to take exemplars of CDM MRV to be applied in NAMAs MRV, yet these proposals have gained objection by developing countries for it is considered as too stringent and therefore inappropriate for NAMAs. Meanwhile the UNFCCC is currently asking for submission from Parties for the framework, design and concept of NAMAs MRV, but only for countries' general views and initial proposals. Yet the Doha meeting already created divergent views amongst Parties on how the ICA process would and should be conducted. Some Parties suggested that the analysis should be done by an expert team. But questions remained on who should be in the team, what is the composition of this expert team and what are the modalities for the team.

There is also the matter of how to efficiently make use existing institutions like the Consultative Group of Expert (CGE), which is a technical assistance body that were created to help developing countries meet their reporting requirements. Despite the technical support by the CGE, capacity building for developing countries to implement MRV is supposed to be channelled by the forms of workshops held by Annex I countries of facilitated by the UNFCCC Secretariat. It

is expected that the workshops will be the forum to share lessons learned, experiences and best-practices regarding low emission strategy, mitigation actions and MRV.

Box 5. Text from The Doha Work Programme

Doha Work Programme

Emphasizing the importance of providing relevant technical advice and support for the process of preparation of national communications and biennial update reports, as well as the importance of providing a forum for non-Annex I Parties to share experiences of this process,

[*Recognizing further* that developing countries require further support in the process to enhanced reporting,]

Recognizing that the preparation of national communications and biennial update reports is a continuing process,

1. Decides to continue the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention [for a period of [three years from 2013 to 2015][four years from 2013 to 2016] [five years from 2013 to 2017]][as a permanent expert group of the Convention];

2. Also decides that the Consultative Group of Experts, in fulfilling its mandate, shall function in accordance with the [revised] terms of reference contained in annex I to this decision;

3. Further decides that membership of the Consultative Group of Experts [should be increased from 24 to 28 with four additional members from Annex I Parties to the Convention (Annex I Parties)] [shall be the same as in decision 3/CP.8, annex, paragraphs 3–8] [should be expanded from 24 to 26 members in order to include one member from non-Annex I countries of Eastern European Group and an additional one member from Parties included in Annex I to the Convention (Annex I Parties)];

4. Decides that the Consultative Group of Experts shall be composed of experts [drawn from the UNFCCC roster of experts] with expertise in at least one of the following chapters of national communications or biennial update reports: greenhouse gas inventories, vulnerability and adaptation assessment, mitigation [financing, MRV/NAMAs, technology] and other matters related to the process of preparation of national communications and biennial update reports;

5. (d) [Providing technical and logistical support, as required [by committees, panels or working groups established to serve as technical experts for its functions including ICA;], [to the Consultative Group of Experts in [serving as] [building capacity for] the team of technical experts for international consultation and analysis;]]

10. [Invites][Urges] Parties included in Annex II to the Convention and other Parties [included in Annex I to the Convention] in a position to do so to [provide][contribute] financial resources to enhance the support by the secretariat to the work of the Consultative Group of Experts and to support the full operation of the work of the Consultative Group of Experts.

9. Requests the secretariat to facilitate the work of the Consultative Group of Experts by:

(a) Organizing meetings and workshops of the Consultative Group of Experts and compiling reports of its meetings and workshops for consideration by the Subsidiary Body for Implementation;

(b) Providing technical support to the Consultative Group of Experts as required, particularly in the areas of national greenhouse gas inventories, vulnerability and adaptation assessment, mitigation assessment, research and systematic observation, education, training and public awareness, technology transfer and capacity-building, [and also mitigation actions and assessments relating to institutional arrangements, assessment of gaps and needs, support received, domestic MRV, projections] as they relate to the process of and the preparation of national communications [or biennial update reports];

(c) Liaising with other relevant multilateral programmes and organizations to provide additional [financial and] technical support [,disseminating the information materials and technical reports prepared by the Consultative Group of Experts to Parties, relevant experts and organizations] to the Consultative Group of Experts as required related to the preparation of national communications and biennial update reports;

Box 5 shows the excerpt of text from the Doha Work Programme, with bracketed words that show which matters are still not being agreed upon. In regards with funding, the Global Environmental Facility (GEF) has prepared operational procedures to finance the development of NCs by developing countries and to assist eligible countries to formulate and submit proposals to access the fund. Under these procedures, fund that is up to USD 405.000 is made available to each countries for the preparation of the NCs, and there's an additional USD 15.000

per country for stocktaking activities and stakeholder consultations in preparations of the project proposals. The GEF also prepared policy guidelines for the financing of BUR of developing countries. Under the guidelines, developing country Parties can access up to USD 352.000 through a GEF Agency or via direct access[12]. All these pending issues are going to be further negotiated in UNFCCC inter-sessional meetings held in mid and third-quarter of 2013.

[12] http://unfccc.int/national_reports/non-annex_i_natcom/guidelines_and_user_manual/items/2607.php accessed on 12 March 2013 at 22.35.

Chapter IV

MRV at National Level: China

As former colonies of the European countries that just gained independence after World War II, developing countries as newly emerging states faced more or less the same problems. The most common and pressing economic problems that many of these states had to face, with the possible exception of some of the oil-rich countries, were poverty, unemployment, unequal income distribution, and low domestic savings. Historically, it has been found that a country consisting of many feuding states, provinces, cities, with many languages, many religions and believe systems, different ethnic groups and different cultural traditions, has a bigger tendency towards separatism since the allegiance of people to their respective localities is stronger that to the country. Lack of homogeneity of population, languages, religion and culture which are crucial to the growth of the spirit of nationalism makes it difficult for the population of different regions to work in unity towards the fulfilment of national goals. History further suggests that such diverse countries need gradual and slow transition process to a democratic governance (Roy et al., 2012).

This chapter presents the explanation of China's MRV implementation. The basic national circumstances are portrayed to give insight of condition of China's political, economic and vulnerability toward climate change. Afterwards, climate capacity, governance and environmental informational governance will be assessed. Climate governance includes policies and actions of MRV which is explained in the context of climate change mitigation, and the institutional arrangements. While environmental informational governance includes analysis of data and information system in general and on environmental sector, and constraints on economy, politics, organisational and cultural aspects. Lastly, China's perspective on the feasibility and justification of MRV is explained alongside the importance of and interest in MRV implementation.

4.1. Basic National Circumstances of China

4.1.1. Geography, climate and vulnerability

Situated in the eastern part of Asia and along the western shore of Pacific Ocean, China is the world's third largest country after Russia and Canada, which covers an area of 9.6 square kilometres and with a coastline of 18.000 kilometres. China's land area accounts for 1/15 of world total, or about as big as the whole Europe. China is bordered by 14 countries, which are

Korea, Vietnam, Laos, Burma, India, Bhutan, Nepal, Pakistan, Afghanistan, Tajikistan, Kyrgyzstan, Kazakhstan, Mongolia, and Russia. While its marine-side neighbours are Japan, Philippines, Brunei, Malaysia and Indonesia.

The vast land of China include plateaus, plains, basins, foothills, and mountains that are higher in the western part and lower in the eastern part, which creates a slope like three-step ladder. The highest step of this 'ladder topography' is formed by the Qinghai-Tibet Plateau at the average height of over 4,000 meters. The highest peak in the world, Mount Everest at 8844.43 meters high, is situated in this area. On the second step are large basins and plateaus with heights bout 1,000 - 2,000 meters. The third step, comprised of broad plains dotted with hills and lower mountains, has altitudes of over 500 meters. These well-cultivated and fertile lands produce abundant crops, which is one of China's prominent assets[13].

Most of the regions in China are located in the temperate zone with some regions in the south located in the tropical zone. China's varied topography and terrain conditions made its climate complicated and diversified. Most regions are cold and dry in winter and have a warm and rainy climate in summer. There is a long winter but no summer in the northern part of Heilongjiang Province, while there is a long summer but no winter in Hainan Province in the south. There are four distinct seasons in the Huaihe River valley, while it is like spring all the year round on the south of the Yunnan-Guizhou Plateau. The climate in northwest China varies greatly in winter and summer. The Qinghai-Tibet Plateau in southwest China has low temperature throughout the year while the desert regions have an arid climate and less rain throughout the year[14].

According to its Report of the State of Environment (MEP, 2011), China is vulnerable to drought and flood, with less precipitation have led to crop harvest disturbances, while heavy rain caused many health and sanitation problems. The recurrent drought affecting middle and lower part of Yangtze has on the extreme caused desertification and at the very least exacerbated pollution in the lakes and tributaries in the river basin, many of which were already badly polluted[15]. China also witnessed the increase in mean temperatures for the last five years, with big fluctuation between the high and low temperatures and more days with extreme heat particularly in urban areas. At the marine and coastal area, China suffered from sea level rise, sea-water intrusion, soil salinization and erosion.

[13] http://www.travelchinaguide.com/intro/geography/ accessed on 09 November 2012 at 17.29.
[14] http://www.topchinatravel.com/china-guide/china-in-brief.htm accessed on 12 February 2013 at 08.45.
[15] http://news.xinhuanet.com/english2010/china/2011-06/04/c_13910705.htm accessed on 23 May 2013 at 14.15.

Pollution has become the biggest problem in China today. There are several polluted sectors namely land and soil, river and river basin, and sea and coastal areas, with pollution threat ranged from heavy metal pollution, wastes that include solid, hazardous and electronic waste, organic chemical to nuclear and radiation. But air pollution was the worst problem of all, with pollution sources of greenhouse gases such as SO_2 and N_2O, and pollution particles like PM_{10} and $PM_{2.5}$. Earlier this year, air pollution in Beijing reached records high that the hazy smog in the air was compared to a sandstorm in the desert region, and people are forced to stay indoors. Beijing Municipal Environmental Protection Bureau put the blame on the combination of coal-fired power plants, heavy industry, vehicle emissions and lack of wind to clear the air. The hazardous air quality has caused many respiratory ailments especially among young children[16].

4.1.2. Political system

China has a turbulent history of political order. It was ravaged by foreign invasion, forced to cede its respective territories due to certain political arrangements, and marred by prolonged internal wars. In the seventeenth and eighteenth centuries China played an important role as a major Asian trading country. But in the 19th and early 20th centuries, the country was beset by civil unrest, major famines, military defeats, and foreign occupation. After World War II, the Communist Party under Mao Zedong established an autocratic socialist system that, while ensuring China's sovereignty, imposed strict controls over everyday life and cost the lives of tens of millions of people. After 1978, his successor Deng Xiaoping and other leaders focused on market-oriented economic development.

According to its constitution, China is a unitary, multinational state with People's Republic of China (PRC) representing legitimate sovereign entity. Although up until now the autocratic state of China is still governed by the communist party (China Communist Party/CCP), its leaders began to open up the closed economy in order to allow market forces and entrepreneurial dynamism to play a role starting in the late 1970. Despite many deficiencies that still remain, the high growth generated by marketization has raised the government budgetary revenue (Yueh, 2010). China has removed restrictions on several vital areas such as in the labour market and capital inflows, though the government has retained its control over many activities in the economy. Thus for much of the Chinese population, though political

[16] Hannah Beech (AP) for Time World: "Beijing Chokes on Record Pollution" 14 January 2013 on http://world.time.com/2013/01/14/beijing-chokes-on-record-pollution-and-even-the-government-admits-theres-a-problem/ accessed on 19 December 2012 at 16.20.

controls remain tight, living standards have improved significantly and the room for personal choice has expanded[17].

The current administration of China is divided into provinces, autonomous regions, municipalities directly under the central government, and special administrative regions. Provinces and autonomous regions are divided into autonomous prefectures, counties, autonomous counties, and cities. Counties and autonomous counties are divided into townships, ethnic townships and towns. Autonomous regions, autonomous prefectures and autonomous counties are autonomous places of various ethnic groups. At present there are 23 provinces in China, five autonomous regions which are Inner Mongolia, Ningxia, Xinjiang, Guangxi, and Tibet; four municipalities directly under the central government that are Beijing, Shanghai, Tianjin, Chongqing; and two special administrative regions of Hong Kong and Macao[18].

4.1.3. Economic condition

The introduction to market-oriented reforms in China stemmed from the structural imbalances derived from the centrally planned economy from 1949-1978. China's "Opening and Reform Policy" initiated a period of economic transformation in 1978. The economic reforms have benefited from conditions where the abundance workforce provided cheap labour for the emerging industrial sector on one side, and high-quality human capital that is educated, innovative, and with entrepreneurship skill on the other side; a set of functioning market institutions; the early stages of development of China that enables the economy to catch up rapidly, particularly in adopting new technology; and the high political interest in economic development (Chow, 2012) . These conditions facilitated economic growth in China to a significant degree.

Despite China's continuing economic growth, big portions of the population remained excluded from the process due to stagnation in social development and rapidly increasing inequality. There are considerable and growing discrepancies in development range and distribution of income between urban and rural areas as well as between provinces. Urban incomes in China today are 3.3 times of rural incomes, and the richest 10% of Chinese earned as high as 23 times as much as the bottom 10%. Living standards and levels of development also vary widely, with Shanghai showing the highest level and Tibet the lowest (Stiftung, 2012a).

Corruption, inefficient bureaucracy and inability of legal bodies to properly implement laws and regulation and lack of sustainability of China's economic development posed serious problems.

[17] http://geography.about.com/library/cia/blcchina.htm accessed on 31 March 2013 at 13.48
[18] http://www.china.org.cn/english/Political/28842.htm accessed on 17 May 2013 at 15.15

Environmental deterioration has caused economic and social cost, that put more burdens on the development of China. Furthermore, China's government is increasingly under pressure to fulfil the demands of the population for better public goods and services like social security, health care, working infrastructure, affordable housing, job opportunity and governmental accountability (Yueh, 2010). Although CCP has been able to win the growing support of the young and educated urban middle class, social unrest is increasing on those who are left behind and with lack of access to the shares of growth.

However, in spite of these drawbacks, currently China is the second-biggest economy of the world with economic growth rates of 9.2% in 2009 and 10.3% in 2010. In 2010, China's trade surplus was $183.1 billion and it became the biggest exporting country ahead of Germany. Macroeconomic performance of China continued to be strong during the financial crisis, mostly because of the measures taken namely the stimulus program to jumpstart the economy, reintroduced price controls and raised interest rates to overcome inflation, and raised the required reserve ratios for commercial banks[19].

4.2. China's MRV Policy and Implementation

4.2.1. Climate change in China: prioritizing on energy intensity

Initially, climate change has not been a priority in China. The central government has put the three issues of energy saving, pollution reduction and climate change together, implying that they have been given parallel significance. Yet there was distinction among the issues where energy saving and pollution reduction were essentially domestic issues driven by internal concerns, climate change has been considered from the beginning as an international issue driven mostly by external pressure (Qi et al., 2008). Moreover, climate mitigation efforts were believed to work against national interests because reducing greenhouse gas emission and energy consumption could slow economic growth .

Coal is the main energy consumed in China, and the mix energy consumption with coal as the main source will remain for a long time in the future. The relatively backwards methods of coal production and consumption have intensified the pressure on environment. Coal consumption has been the main cause of the air pollution in China, as well as the main source of greenhouse gas emission (Richerzhagen and Scholz, 2008). Figure 11 below shows the proportion of coal in China's energy consumption:

[19] http://data.worldbank.org/country/china accessed on 14 December 2012 at 23.10.

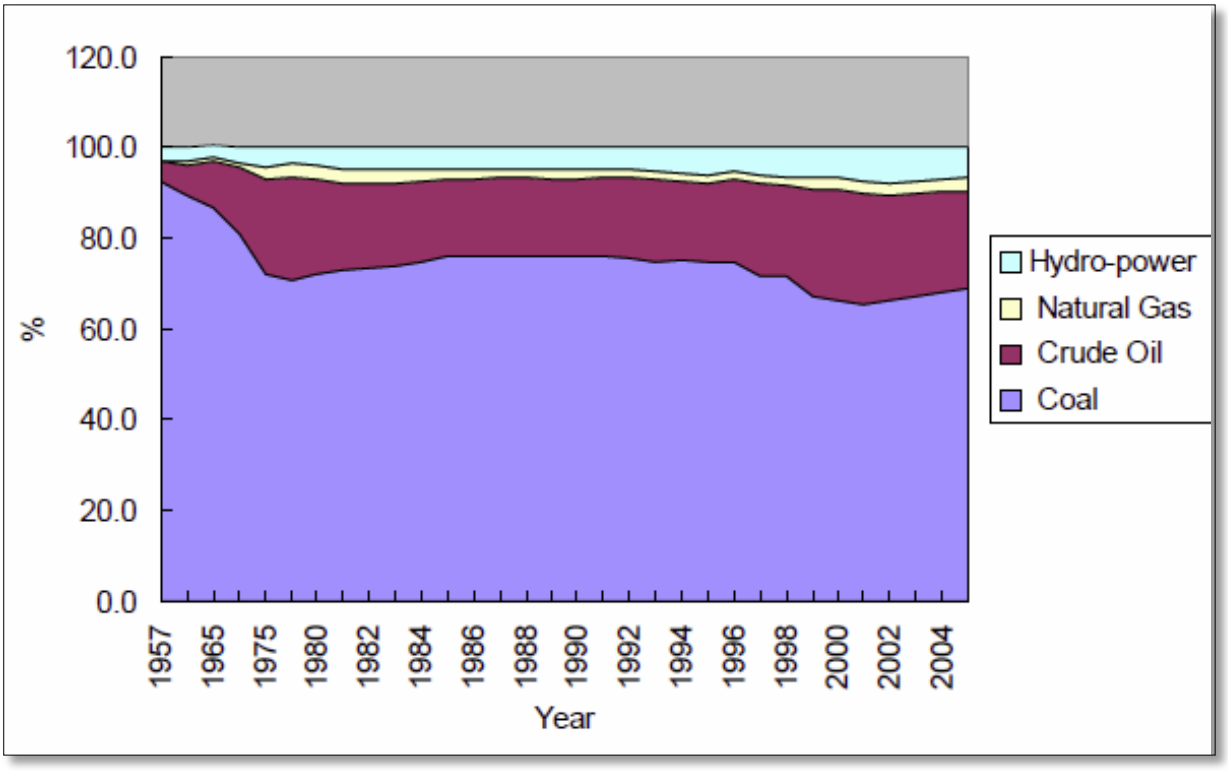

Figure 11. Energy consumption mix in China (Liu, 2007)

Climate Change has then been treated by government as a matter of sustainable development, especially as being tied to energy saving. Sustainable development is widely accepted whereas circular economy that fostered comprehensive utilization of resources, enhancing energy efficiency, promoting renewable energy and reducing greenhouse gas emission, has gained more voice and support throughout the country. Along with China's rapid economic development and the acceleration of industrialization and urbanization, the demand for energy keeps increasing with the construction of a stable, economical, clean and safe energy supply. The high demands caused high carbon emissions, particularly in industry, building and transport sector (Jiang, 2011). Therefore, energy intensity was set as main strategy to address climate change in China. Figure 12 below shows

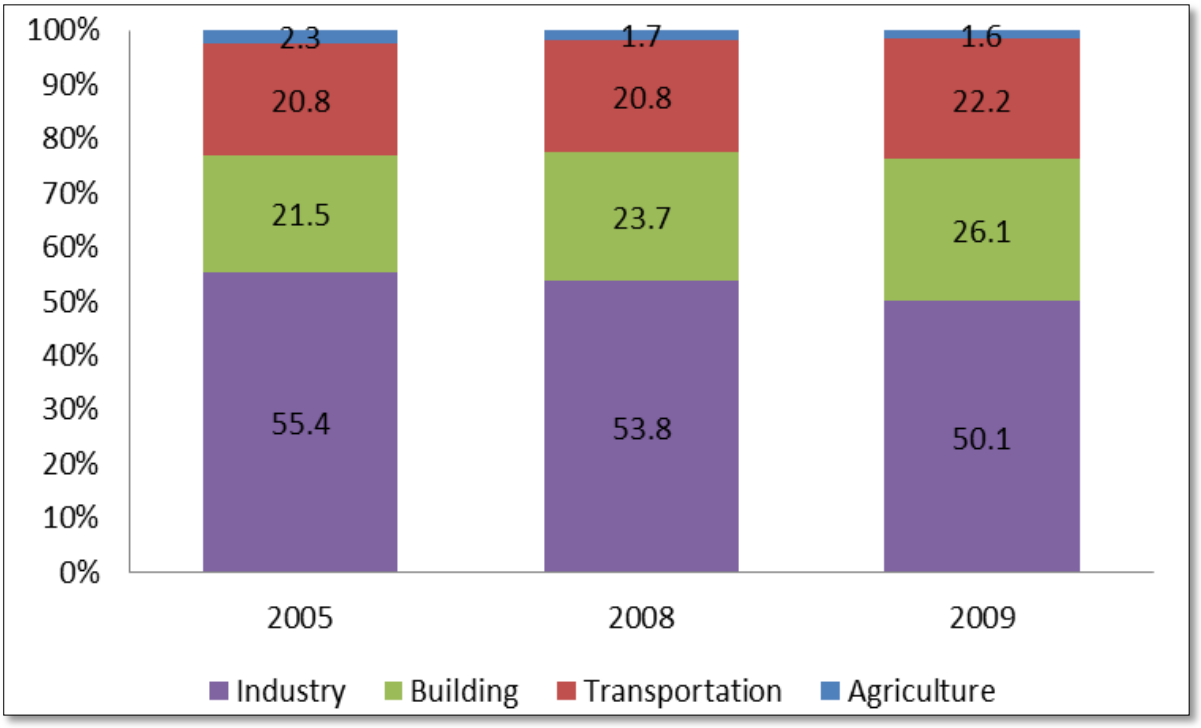

Figure 12. Energy-related CO2 emissions by sectors (Ke, 2012)

China is now the world's second largest energy producer and consumer. The sustained growth of energy supply has provided an important support for the country's economic growth and social progress, while the rapid expansion of energy consumption has created a vast scope for the global energy market[20]. Yet at the same time, China is taking largest energy conservation and renewable energy campaign in the world. The advancement of energy using technology, especially clean coal technology, is crucial for large scale mitigation. Energy conservation and environmental protection actions will help to reduce GHG emission at large. Thus far, China has established national laws and plans such as the Energy Conservation Plan, Renewable Energy Law and 11th FYP Energy Plan that stated the National Energy Intensity Target. However, China needs a more integrated policy package rather than stand-alone energy and climate change policies (Liu, 2007).

[20] Report of the Information Office of the State Council of the People's Republic of China, December 2007

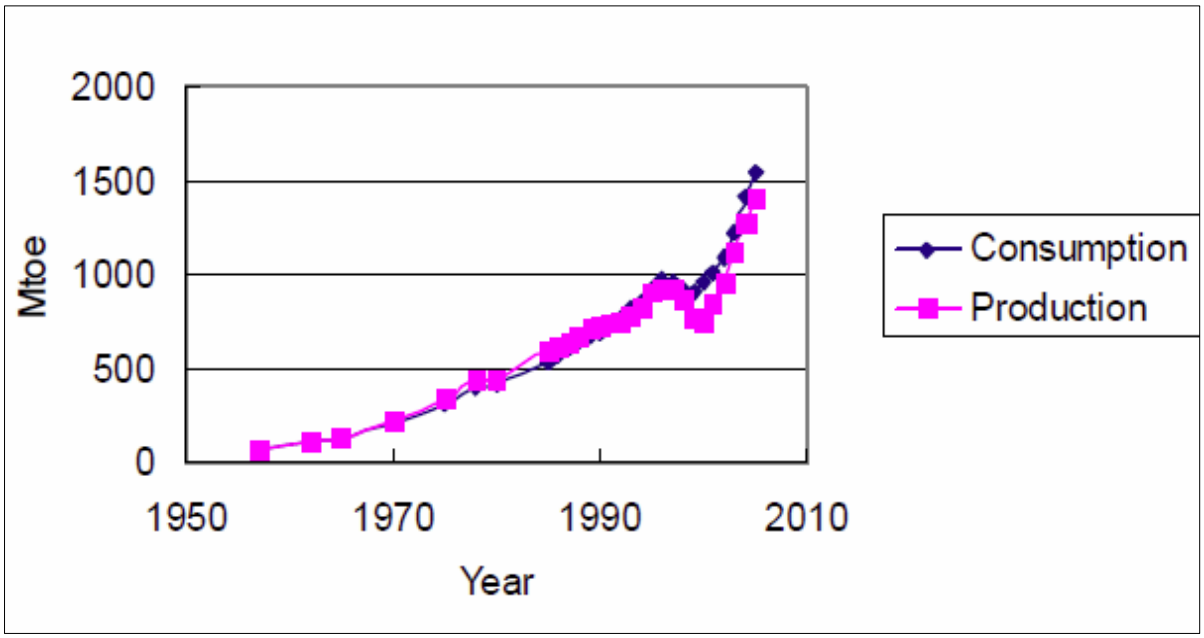

Figure 13. Energy Consumption and Production in China (Liu, 2007)

Chinese government is currently accelerating the development of a modern energy industry, taking resource conservation and environmental protection as its two basic policies, while giving prominence to building a resource-conserving and environment-friendly society in the course of its industrialization and modernization. The energy development plan emphasized on thriftiness, cleanness and safety, and was based on the principle of relying on domestic resources, encouraging diverse patterns of development, relying on science and technology, protecting the environment and increasing international cooperation for mutual benefit. China is striving to ensure a stable supply of energy with a steady increase in domestic energy production and promote the common development of energy around the world. The strategy and goals of energy development in China includes[21]:

- Promotion of energy conservation
- Improving energy supply capacity
- Accelerating the progress of energy technologies
- Coordination energy and environment development
- Deepening national energy system reform
- Strengthening international cooperation in the field of energy

[21] *ibid*

4.2.2. China's policies and actions to address climate change

After the 1992 UN Conference on the Environment and Development, China was the among first to formulate national Agenda 21 titled China's White Paper on Population, Environment and Development in the 21st Century which reinforced environmental protection in an all-round way through legislative and economic means. However, as China still perceived itself as a developing country, it felt the need to set an infrastructure that put the development of its economy and eliminating poverty as the main goal of its development plans. Still, there's an acknowledgement in these plans of the importance of environmental sustainability in being able to reach not just higher levels of income and but also increased welfare of the Chinese people.

The short-term development strategy of China is stated in the Five-year Plans (FYPs) which contain comprehensive economic and social development guidelines for all the nation's regions. The FYPs are blueprints that provide overall objectives and goals related to social and economic growth and industrial planning in key sectors and regions. Under the general FYP, different sectors also prepare sectoral Five-year Plans including those for Renewable Energy Development and sector-specific Energy Conservation plans, and the Five-year Plan for Environmental Protection.

Climate Policy

The 11th Five-year Plan for Environmental Protection in 2006-2010 was issued by the State Environmental Protection Agency (SEPA) (currently the Ministry of Environmental Protection/MEP) and National Development and Reform Commission (NDRC), and being approved by the State Council in 2007. The 11th FYP has set the compulsive goal for reducing per-unit GDP energy consumption in 2010 by 20% from 2005 baseline. During the period, China claimed to have achieved significant results in controlling its greenhouse gas emission by promoting industrial restructuring, energy restructuring and energy conservation, improving energy efficiency, and increasing carbon sink. China has accomplished its energy conservation goal in that period by lowering the energy consumption per-unit GDP by 19.1 % from that of 2005 accumulatively, which is equivalent to a reduction of 1.46 billion tons of CO2 emissions (Seligsohn et al., 2009).

The national climate change goals for China are also outlined in the National Climate Change Program released in June 2007 (NDRC, 2007). This was the first time the government of China synthesized its climate strategies at national level. The NCCP set major quantified objectives related to climate change to be achieved in 2010, that included the ambitious target of reducing energy intensity (energy consumption per unit of GDP) by 20 per cent and decrease emissions

of the main pollutants by 10 per cent from 2005 levels, and to increase the use of alternative energy to 10 per cent of primary energy consumption. Table 1 below shows the energy intensities and targets for major industry sectors:

Table 4. Energy Intensities and Targets for major industry sectors (NDRC, 2007)

	Year 2000	Year 2005	Year 2010 Targets
Thermal Power (gce/kWh)	392	370	355
Steel (kgce/t)	784	700	685
Aluminum (tce/t)	9.923	9.595	9.471
Cement (kgce/t)	181	159	148
Ethylene (kgce/t)	848	700	650
Railway transportation (tce/Mt*km)	10.41	9.65	9.4

The State Council Information Office then published a White Paper on Climate Change in 2008 comprised of *China's Policies and Actions for Addressing Climate Change*. The document, composed of eight chapters, introduced China's situation and impact of climate change on China, strategies and objectives for addressing climate change, mitigation and adaptation policies and actions, institution and mechanism building, enhancing of public awareness program, and China's active and constructive role in the international cooperation on climate change[22].

Currently, China is in the 12th FYP (2011-2015). The 12th FYP key themes are rebalancing the economy, ameliorating social inequality and protecting the environment. Some important initiatives in the plan include a national GDP growth rate target of 7%, promoting consumption over investments and exports, closing the income gap through minimum wage hikes and increase social safety nets, and a wide range of energy efficiency targets. To reach the energy targets, various measures are taken, such as comprehensively optimizing the industrial structure and energy mix, practicing energy conservation and raising energy efficiency (Lewis, 2011).

In line with China's national objective of reducing GHG emission per-unit GDP by 40-45 per cent by 2020 as compared to that of 2005, the 12th FYP stated the following compulsive objectives: By 2015, CO2 emission per-unit GDP would be reduced by 17 per cent and energy consumption per-unit GDP by 16 per cent as compared with that in 2010; the proportion of consumption of non-fossil energy to the consumption of primary energy would be increased to 11.4 per cent; and the acreage of new forest would increase by 12.5 million ha with increased in forest

[22] http://www.china.org.cn/government/news/2008-10/29/content_16681689.htm accessed on 8 February 2013 at 13.40.

coverage rate and forest growing stock. Based on the objectives, China is coping with climate change in the 11 major aspects as below[23]:

1. Strengthening the legal system building and strategic planning in addressing climate change
2. Accelerating economic restructuring through policy readjustment and institutional innovation to foster low-carbon development
3. Optimizing energy mix and developing clean energy
4. Continuing to implement key energy-conservation projects
5. Vigorously developing a circular economy
6. Steadily launching low-carbon pilot projects
7. Gradually establishing a carbon emissions trading market
8. Enhancing the capacity of carbon sinks
9. Enhancing the capacity of adaptation to climate change
10. Continuously strengthening capacity building
11. Carrying out all-directional international cooperation on climate change.

On top of these sectors, in 2011 the government released the Comprehensive Working Plan for Energy Conservation and Emission Reduction and a Work Plan for Controlling Greenhouse Gas Emission as an overall arrangement for energy conservation, emission reduction and GHGs emission control during the 12th FYP.

Institutional arrangements

NDRC and MEP are the two leading institutions in climate change policy planning and implementation in China, with Ministry of Foreign Affairs (MoFA) is the institutions in charge of climate diplomacy and negotiation (Richerzhagen and Scholz, 2008). Yet in order to improve institutional coordination in climate change, China created the National Coordination Committee on Climate Change (NCCCC) which comprised of 17 ministries and agencies. Starting from 2001, the NCCCC organized the work on the compilation for the Initial National Communication on Climate Change that were submitted in 2004 (NDRC, 2007). The NCCCC was first set up within the China Meteorological Administration, but then it was relocated to the State Development and Planning Commission (the former body of the NDRC).

In June 2007, the State Council established the National Leading Group on Climate Change (NLGCC) that led and oversaw about 30 government agencies including ministries,

[23] http://www.china.org.cn/government/whitepaper/2011-11/22/content_23977426.htm accessed on 13 February at 22.14.

commissions, administrations and office. The leading Group is responsible for deliberating and determining key national strategies, guidelines and measures on climate change, as well as coordinating and resolving issues related to climate change. It demonstrated the change in government's stance on climate change, of which it has become a priority (Qi et al., 2008). In 2012, China's government also established national climate change think tank, which is the National Climate Change Strategy Research and International Cooperation Centre to further strengthen national research capacities and capabilities in addressing climate change. The Centre will provide policy decision-making support for climate change negotiations, advise on low-carbon economic development and cooperate internationally in this area[24].

Other institutions involved constitute for example university-based research institutes, Chinese Academy of Science, State Meteorological Administration, National and Local Bureau of Statistics, and National Energy Administration. Climate change programs implementation/deployment will be through provincial and local government, enterprises, businesses and industries sectors. Below is the figure of climate change deployment:

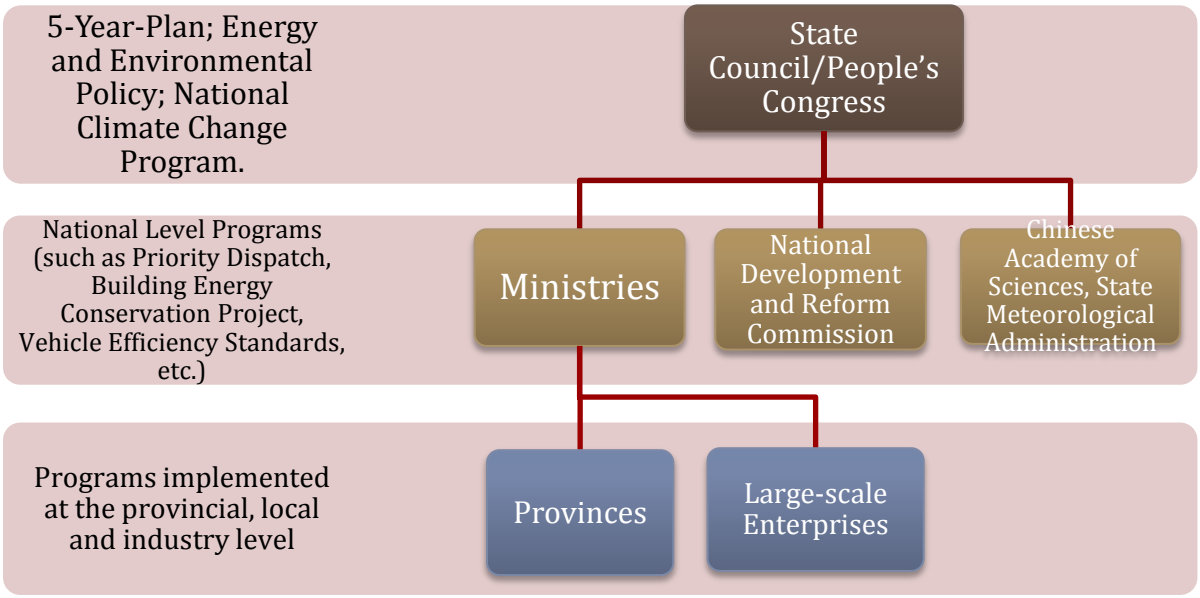

Figure 14. Flow of Mitigation Actions implementation/deployment (Ke, 2012)

[24] http://www.chinadaily.com.cn/business/2012-06/11/content_15493199.htm accesses on 29 June 2013 at 15.30.

4.2.3. China's MRV Policies and Implementation

To implement the MRV requirement of the Bali Roadmap, China's Government Work Report in 2007 mandated the government at all levels to set up the indicators system, monitoring system, and assessment system for energy conservation and emission reduction, and to fully implement an accountability system. China explicitly declared its goal to establish an MRV regime amongst the best in the world. China has actively implemented MRV for sustainable development and has already made a significant progress in the NAMAs of energy conservation and emission reduction aspects (Zhao, 2010).

China's further position on NAMAs and MRV was issued by Chinese Government on May 2009 as the response toward the then upcoming Copenhagen Climate Change Conference[25]. China is of the view that NAMAs in developing countries should be the mitigation actions that are supported by technology, financial and capacity building from developed countries. The NAMAs that are subject to MRV requirements were only where such NAMAs are enabled by supports and whereof that supports are subject to MRV as well. In summary, China has the propositions that the MRV for developing countries will be conducted following the mechanism below (Xumei, 2012):

- At national level, under international guidance
- For supported action, reporting made through financial and technology mechanism
- For unilateral action, reporting made through national communications

According to Copenhagen Accord, and unlike in the Bali Action Plan, any NAMAs will be subject to international MRV be it taken by developed or developing countries. This difference was contradicting to China's view as described in the mechanism above. This was the main reason that China opposed of the Copenhagen decision. International MRV is considered unacceptable since it conflicted with national sovereignty. China has raised the debate of whether Copenhagen's international MRV is an appropriate and effective way to improve transparency and enhance international trust (Zhao, 2010). However this objection has been softened after the Cancun meeting and now China has accepted parallel actions of domestic and international MRV, with reservations that the ICA process is only for supported actions and there should be different requirements for voluntary unilateral actions.

China has produced its First National Communication in 2004 based on 1994 environmental data. Yet the data regarding emissions has only being reported in the Second NC in 2012 that include national GHG Inventory covering the data of 2005. The reporting scope of China's

[25] http://www.china-un.ch/eng/bjzl/t564324.htm accessed on 24 June 2013 at 19.55.

National GHG Inventory was covering five major sectors, which are energy activities, industrial processes, agricultural activities, land use change and forestry, and waste treatment, and involving six greenhouse gases as listed by the IPCCC. The institutions that engaged in the preparation of this inventory mainly followed the methodologies provided in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories and the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas, and referred to the 2006 IPCC Guidelines for National Greenhouse Gas (P11).

Currently, China is creating an expert team for the preparation of the Third NC, BUR and updated GHG inventory with data from 2008. During the development of the NCs and GHG Inventory, China received support in the form of grant from the UNDP, as the implementing agency of the GEF. Based on the experiences in developing NCs, China perceived BUR obligation as only an extension to NCs, and will try to comply with the submission requirement and deadline despite the lack of clarity on the MRV mechanism for the BUR. However, just as the process of NC, the development of BUR will still need to be supported with financial and technical assistance (P4).

The existing MRV system in China comprised of statistics, reporting and reviewing/monitoring of energy intensity target. There is yet a system specifically for carbon accounting. The MEP has a different system for monitoring and accounting of traditional pollutants that is related to clean air, water pollution or municipal waste. The establishment of statistical system for GHGs emissions in China is based on the improvement of energy statistical system. The MRV system for carbon and other GHGs emission then would be taken from the system of energy accounting which covers three areas of energy production, energy circulation and energy consumption (Teng et al., 2009). Figure 5 below shows the data source of the three areas for the energy accounting system:

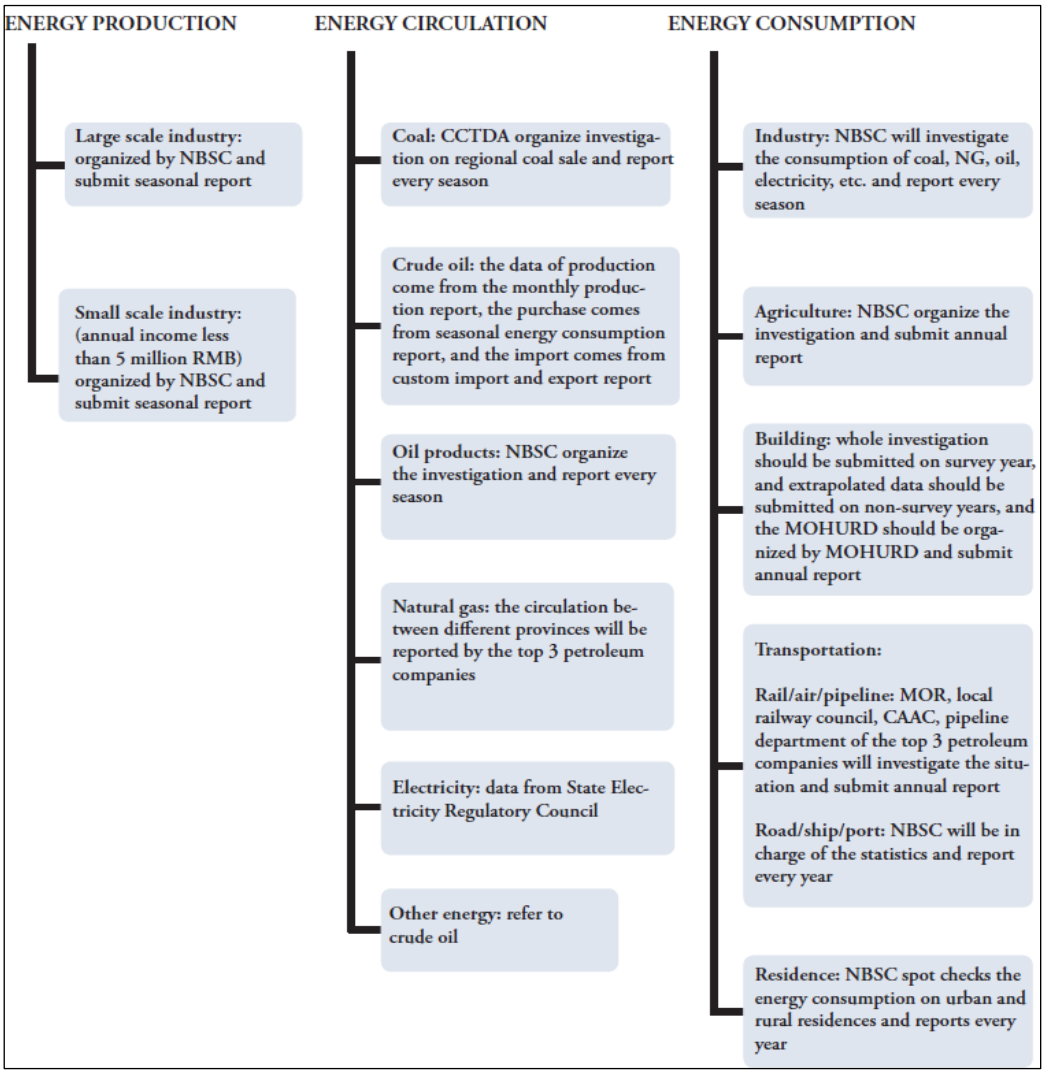

Figure 15. Data source of the energy accounting system (Teng, 2009)

Data were gathered from reports submitted by industries or companies, or by line ministries, regional, provincial and local governments. All levels of government then report through their Statistics Departments. The NDRC and National Bureau of Statistics of China (NBSC) jointly set the standards and implement the system, where NBS collects the data and the NDRC leads a verification and inspection process. Based on an on-site assessment, the NDRC drafts an examination report and submits it to the State Council. After being examined and approved, the report is being returned to NDRC, and published in energy year book to general public. Figure 16 shows the flow of procedures in the reporting mechanism:

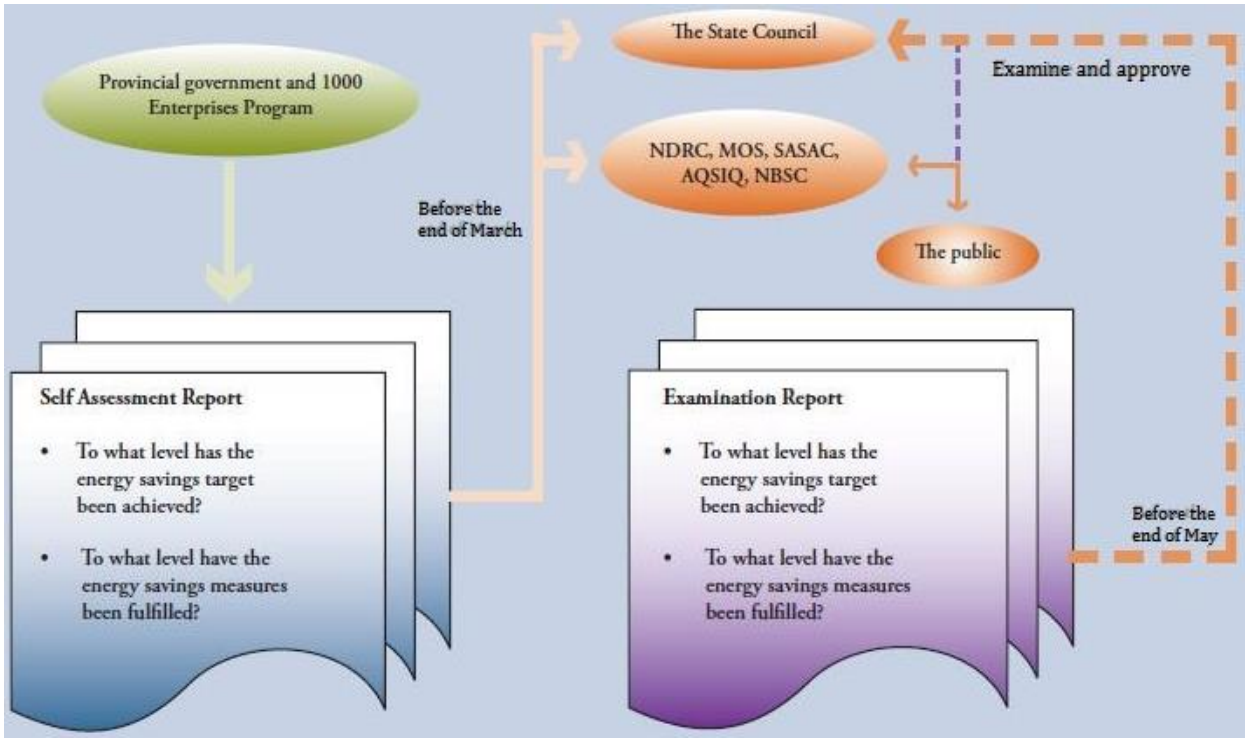

Figure 16. Reporting mechanism for energy accounting system (Teng, 2009)

Central government monitors the progress made by provincial governments in achieving their target. A government- approved team conduct the on-site assessment for more than 10 per cent of key enterprises annually. The monitoring system is shown in figure 17 below:

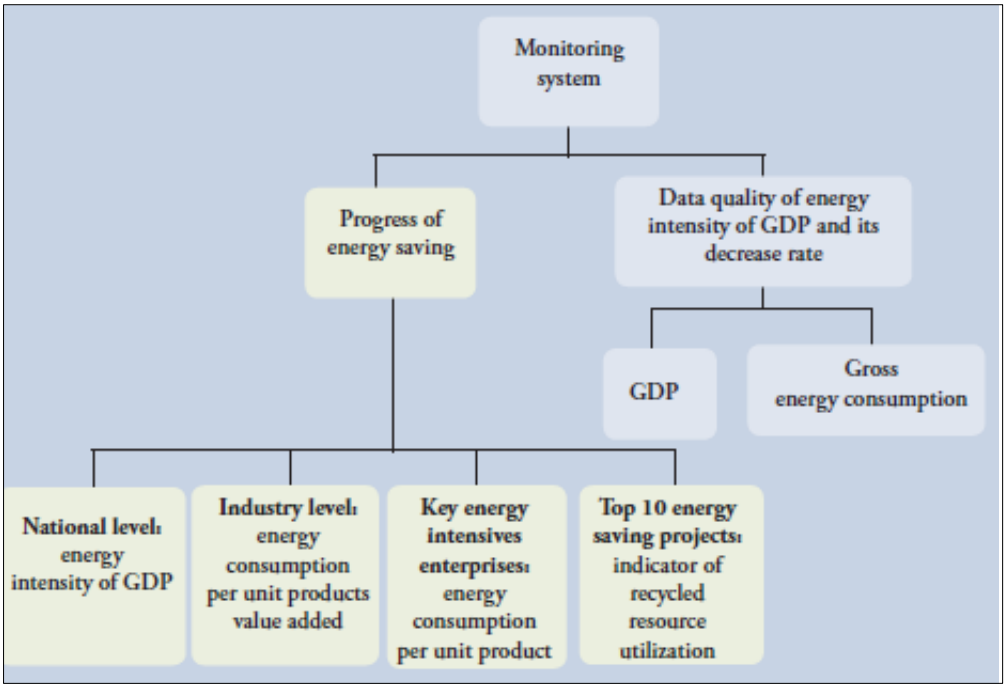

Figure 17. Monitoring system of energy target (WRI, 2009)

China's systems of reporting and monitoring differed greatly per policy and sector. And as the systems were only being introduced recently, it is not yet possible to test the quality of the systems or the reliability of the data produced. Moreover, it should be noted that some policy review and data collection processes are centralized, while others are decentralized. This problem lead to a diverse performance review of QA/QC (quality assurance and quality control) process (Teng, 2009).

At the provincial level, most provinces started complying and applying GHGI for the first time, following the requirements of NDRC "The Notice of the General Office of the NDRC on the start of the relevant matters of provincial greenhouse gas emissions inventory preparation" issued on September 2010 (NDRC, 2010). A database for inventory is under development, and alongside translated IPCC guideline, they are being distributed to provincial government. There are seven pilots of carbon trading scheme, which accounting and reporting of carbon emission are embedded for these pilots. Because this is the first step of carbon trading, they need to allocate the allowances to the participating enterprises. As for the state owned enterprises, they're already obligated to make regular report of carbon emissions from energy (P7).

4.3. National Circumstances for MRV implementation

4.3.1. Climate capacity

China has unitary and centralized governance system. Such system supposedly enables an easier coordination and command and control within governments, particularly between central and local government. Yet there are barriers in terms of capacity, motivation, compliance and incentives. Local government response to climate change established as a response to the central government's expectation for them to take actions. This establishment was not a result of growing vulnerability toward climate change effect or a growing awareness of the importance to take actions, and local governments' policy are mainly expressing the policy of central government. However, local governments came to realize that climate mitigation is closely tied to energy saving, a highly relevant and important issue to local economic development. Economic growth through energy-efficient industrialization is a primary motivation for local government (Qi et al., 2008).

However, apart from motivation, there is a concern of power and capacity. Capacity for climate change research, know-how and implementation of mitigation and adaptation actions is low at provincial and prefectural levels. Technical capacity is concentrated at the central government, particularly in Beijing. Chinese government and political system also known as rigid and does not encouraged innovation. These matters will need to be improved alongside clear, mandated

policies and plans from central government. Thus, capacity building is needed both at central level and prominently at local level, to raise awareness, enhance knowledge and improve vision and leadership value of the local government in climate change issue (Richerzhagen and Scholz, 2008).

4.3.2 Environmental informational governance

China's first access to information statute just took effect in 2008. Since then, the reviews about how the national Regulations on Open Government Information (OGI) have been carried-out are mostly critical, with titles like "China's transparency is Just Thin Air" or "China's sham information disclosure law"[26]. China, like many countries around the world, shares a tradition of government secrecy. And to open the doors to China's complex and massive bureaucracy and its data records are hard tasks that would take time to do. However, the Regulations had had an impact within Chinese people in terms of increased awareness of their rights and interests as citizens and taxpayers, and also on the government policy and way of conduct (Horsley, 2007).

The regulations required government to disclose information about its operations and other matters that are considered to be of public particular interest. Failure to do so will count as an infringement and could be filed as a lawsuit. The government websites have a special section with institution leaders' mailboxes or room for inquiries, though most of these websites are not well-organized or maintained. Under the Regulations, Chinese citizens, enterprises and other organizations can also request for information that has not been disclosed. Yet in the implementation, there are problems such as conflicts with existing legislation like the State Secrets Law, confusions among bureaucrats on how to carry the regulations and lack of adequate resources to meet records management and information request demands[27].

Indeed, while information regarding personal data and matters of public interest such as details on government expenses and budgets were made available, government agencies have generally been reluctant to provide information on their operations and policies. Moreover, Chinese justice system has frequently refused to accept lawsuits over information disclosure or have found in favour of the government. But even when specific information requests and lawsuits were not successful, this Regulation can already accounted as positive changes in

[26] http://www.atimes.com/atimes/China/JI12Ad01.html accessed on 09 March 2013 at 23.30.
[27] http://www.freedominfo.org/2010/04/update-on-china-open-government-information-regulations/ accessed on 15 March 2013 at 20.14.

Chinese law and policy, since prior to the Regulations enactment, even the disclosure of government budgetary information was unthinkable[28].

Aside from the national communications that are produced and submitted to the UNFCCC, domestically there are the reports of the State of the Environment. The reports are published annually by the MEP since 1996 and now have been made available online to be accessed by general public through the MEP website[29]. In its early years, the reports were somewhat cautious in describing the environmental situation in China. It was only after the environmental agency achieved ministerial status in 2007 that the reports started to become more critical in its description and explanation. The data and information provided in these reports were somewhat contributed to the environmental policy-making process in China, although there are no measurement to confirm this[30].

Based on the experts' interview, the state of environmental informational governance in China is still at early stage with lack of basic necessity and calls for improvement. The data collection at ground level is weak, a result of both lack of capacity and technical problems such as unstandardized procedures and lack of technology needed to collect data. The inadequacy in data hampered the data processing and production processes, and the existing data in not streamlined enough to support the policy-making process. While on the matter of public access to environmental information, the problems faced are more or less the same with other sector's information disclosures that have been explained previously (P6). More on the barriers on environmental informational governance in general, and specifically on the issue of climate mitigation actions MRV, will be discussed in the next section.

4.3.3. Constraints, gaps, opportunities and challenges in MRV implementation

With politically centralized system, China's central government decides on what or what not to do. This system has proven to be more efficient in policies implementation and deployment, despite some discrepancies on the capacities and technicalities between central and local government as described previously. Chinese leaders have also shown political will toward enhancement of emission reduction and establishment of an MRV system. In international negotiation, China has included some provincial and local representatives, which promoted more understanding and incentives for local governments to take actions (P6).

[28] http://www.hrichina.org/content/3247 accessed on 15 March 2013 at 22.45.
[29] http://english.mep.gov.cn/standards_reports/soe/ accessed on 10 December 2012 at 14.15
[30] http://www.chinafaqs.org/blog-posts/china-issues-annual-state-environment-report-ministry-calls-situation-very-grave

However, the persisting constraint lies on the institutional and organizational matters. For example, carbon accounting is covered by NDRC, but other pollutants such as SO_2, NO_x and CH_4 are covered by the MEP. For carbon intensity target, it is governed by another department of climate change under the NDRC while energy intensity target is governed by Ministry of Energy and Natural resources. It is then difficult to coordinate because each institution has their own system, different level of capacity and human resources that are not harmonized. Furthermore, these institutions sometimes competed with each other in terms of who is in charge of what, and also in sharing of data and information (P11).

In terms of economic constraints, most of the interviewees is of the view that if the previous constraints in political and organizational are overcame, then there will be no problem (P. Since climate change has been streamlined in the development strategy, the financing for addressing this issue has been incorporated within the development plans. Yet they are also of the view that since China is still part of developing country Parties in the UNFCCC, they are entitled to supports in terms of capacity building, technical and technological assistance, and also financial support (P4, P7, P11).

Beyond the economic and political constraints, there are many technical gaps and challenges for MRV implementation. The problems include, among others, lack of legal basis (P12), lack of publicly-available systematic reporting and monitoring programs; conflicting and difficult-to-interpret information provided in various reports, database and website; information that are often reported in units that are not clearly defined and standardized; lack of consistency between national intensity target and target of all provinces (both for energy and carbon intensity) and of relative target and absolute target. Overall 20% energy/GDP target is a relative target (ratio of energy to economic output), while most of the targets for the individual programs are absolute targets (like the savings of 100 Mtce by 2010 for the Top-1000 enterprise program), making it difficult to relate province's individual programs to the overall energy intensity goal (Ke, 2012). With existing gap between reported data from local governments and calculation made at central that amounted to 20%, it is hard to measure progress, since even if provinces claimed they have achieved target, but nationally it could be different and not ensured (P11).

Human resources capacity is also a problem. As discussed previously, there is lack of expert and expertise familiar with accounting and MRV, except in the capital of Beijing or cities like Shanghai and Guangdong where many mitigation activities have been running. For example, computer based database is established, asking provinces to submit annual data. But it is hard to do because local government or enterprises don't know how to submit data, and this lead to

more problems like double counting issue or just low quality data and information. On top of that, there is cultural problem where misuse of data, misinterpreting data, and even intentionally adjusting data to match the results are considered as common practice in China. This has led to even less reliable and accountable data and information in China (P11).

Specifically related to inventory, China's current statistical indicator system is not fully consistent with what is required for the inventory preparation, and some activity level indicators have not been incorporated in China's current statistical system. Adequacy of the activity level samples from typical surveys is limited, with some parameters relevant to the emission factors derived from sample tests and on-site measurements are not representative enough. Due to lack of the country-specific emission factors in some sectors, the default values from the IPCC Inventory Guidelines are used (PRC, 2012).

Despite the constraints, gaps and challenges mentioned above, there are opportunities presented from the implementation or enabling implementation of MRV. The opportunities are, among others, awareness is raised regarding the MRV and its importance, there is cognizance of dis-alignment of authority particularly between NDRC and MEP that needs to be fix, and acknowledgement of the need for stronger legal basis for institutional arrangement and other technical matters surrounding NAMAs, MRV and GHG inventory (P4, P12)

4.3.4. Role of non-state actors

As MRV is a new issue within the bigger picture of climate change, the role of non-state actors are not really significant. However, though existing accounting and monitoring process are under government, research institutes play more roles in this issue since they have knowledge and expertise in methodologies and systems. They have familiarity in technical matters of MRV, namely accounting and data handling. Therefore, research institutes are being engaged to work together with government in preparation and development of NAMAs and MRV strategy (P11).

There is growing recognition among industries in China to do emission accounting beyond energy accounting as obliged. Some businesses have already done own measurement served for carbon trading under CDM projects, or under the newly-established domestic carbon trading scheme. Other large or multinational enterprises are doing measurement to gain acknowledgement and to comply with international standards. The enterprises are expecting higher profit from this acknowledgement, and also some kind of reward from the government by taking actions (P7).

Regarding civil society, many of the NGOs in China are better described as government-organized non-governmental organizations (GONGOs). They are funded, controlled and supervised by the state and mainly operate as purveyors of CCP policies. Environmental NGOs only established in early 1990s with general interests in environmental issues including climate change, but not yet specifically on MRV. Although NGOs do not have authority to make policies, they have the ability to influence the government's policy-making process and implementation (Schwartz, 2004). Alongside the media and other government-watcher organisations, they are expected to play role to help monitoring progress of the national target in carbon intensity, both at national or city level (P11).

4.4. China's perspective of MRV for developing countries

4.4.1. The importance of MRV for China

Based on the current development on climate change meeting rounds, China claimed to have noticed that many Parties noted the importance about transparency for 2015 agreement. The transparency should be built on the MRV system and the ICA and IAR as international verification mechanisms. Yet, China has been very clear regarding its priority of the developmental goal. Climate change issue is taken as part of its sustainable and low carbon development path, thus is important and inseparable with the overall development plan and strategy. China has established its nationally legally binding target on energy intensity, and conducted mitigation actions and adaptation strategy to achieve the target (P11).

National MRV system is essential to ensure achievement of the target, regardless the lack of clarity resulting from the on going negotiation at international level. Despite limited capacity, human resources, and technology, China is developing a system to track the achievement of quantified target, alongside NCs, BUR and GHG Inventory (P7). However, China is first focusing on MRV system for domestic target, and later on perhaps to integrate and synchronise it with international system (P12). Thus China's government is trying to simplify the system, so as not to be as complicated as in the IPCC guidelines. A simple accounting system is believed to help achieve China's goals in mitigating through energy sector (P11).

4.4.2. National interest in implementing MRV

The establishment of national MRV system is then in line with China's national interest, if directed to fulfil the need to measure and monitor progress in achieving national emission reduction target. A monitoring and measurement system will drive the government to implement the target, even until the household level. Thus an MRV mechanism should be aligned with any actions, with hindsight to be more efficient in implementing program, to better

coordinate among institutions and agencies, and to avoid double counting. Limited resources is not an excuse to not doing MRV. On the contrary, lack of resources is the more reason to calculate where to invest and how to improve (P12).

The government of China is expecting domestic incentives from implementing MRV . For example, on the problem of high level of air pollution that is being experienced in capital city of Beijing. Public has strongly demand for government to take actions to address this issue alongside climate change, since they have realized that both problems are mutually inclusive (P11). Another motivation is the improvement of quality of life and human health, for climate change effects have proven to be linked to health problem, be it directly or indirectly. Therefore, MRV is seen as a way to ensure that real actions are being taken to tackle climate change, which in return will reduce the level of air pollution and improve quality of life and health condition of the people. For industry sector, the incentive expected is international acknowledgement and to get carbon certification from either the national government or international crediting entity, just like in CDM scheme.

Despite the three types of MRV as stated in BAP that include MRV for NAMAs, MRV for GHG Inventory and MRV for support, China is of the view that the stringency of MRV at international level should be limited only for actions. Meanwhile, at the national level, MRV should cover the mitigation actions, the policy adopted toward NAMAs implementation, and the actual emission reductions. Regarding the design of climate mitigation actions MRV for developing countries, the views are divided between a standardized, top-down mechanism (P12); a country driven, bottom-up design (P4, P11), and hybrid that combined the twos (P6). Standardized MRV design is deemed to be the better strategy to achieve global emission reduction target, and to have a better outlook and achieve transparency of country's individual actions. Particularly if NAMAs are going to include carbon offset, the mechanism of carbon trading, pricing or taxing should have standardized MRV. On the other side, the MRV system should consider the different situations among developing countries, so it supposed to be country driven.

4.4.3. Feasibility and justification of climate mitigation actions MRV for developing countries

In order to get the perspective of the feasibility and justification, the research elaborates findings from secondary data and interview result. The outcome of this elaboration is summarises in the table of variables, criteria and indicators for China MRV implementation as below:

Table 5. The compiled analysis of findings on the variables, criteria and indicators for China MRV implementation:

Feasibility					
International climate regime	Provisions for MRV		Exist	Not clear	No
		Guidelines for MRV		x	
		Framework/design of MRV			x
		Supports availability to implement MRV	x		
National circumstances	National governance		Good	Medium	Poor
		Climate governance		x	
		Environmental Informational Governance			x
		Involvement of non-state actors			x
	National constraints		High	Medium	Low
		Economic constraint			x
		Political constraint			x
		Organizational/Institutional constraint	x		
		Cultural/Interpretational constraint		x	
		Other gaps and challenges		x	
Justification					
International climate regime	Principles of the Convention		Just	Medium	No
		Common but differentiated responsibility			x
		Voluntary mitigation actions for developing countries			x
		Align with national development priority and country's respective capability		x	
National circumstances	National interest		Yes	Not clear	No
		Achieve national mitigation target		x	
		International acknowledgement and supports achieved		x	
		Domestic policy incentives	x		

The evaluation for the indicators is using a simplified scoring that is explained in detail in the discussion of methodology in Chapter VI. However, as this is a qualitative research and the interviews conducted applied open-ended questions, the results of the interviews are varied and difficult to be quantified. Thus the research is using interpretive analysis in processing data, incorporating both from primary and secondary sources. Interestingly, the interviewees mostly shared similar views, albeit minor issues and details. They were only providing different background and reasoning to the questions asked. The findings then are explained below.

For China, despite existing inadequacies and constraints, to establish a domestic MRV system and to follow the requirements of the international regime on MRV for developing countries are considered feasible. But it still needs a long way to go, because the environmental informational governance especially related to data and information system is still weak. A rudiment MRV system is expected to be established in between five years from now (P4, P12), or by 2015 which marks the end of the 12th FYP (P6, P7), or at least before 2020 (P6, P11).

By looking at China's national interest, China in principle needs MRV anyway. Developing and implementing MRV system is perceived as a wise decision and investment. MRV is an instrument within a process, a tool to know at which stage of the process that one stands and how far one has progressed in between target. Yet the international pressures are focusing mainly on mitigation actions, while developing countries need also and even more adaptation strategies to tackle climate change. But focus and provisions for adaptation actions is lacking, let alone its MRV. So while China would like to have adaptation actions along with its support for MRV, this seems to be even longer way to go (P6).

MRV is a crunch issue in negotiation. It is important but not critical as to hamper the negotiation. But some countries do hold on to it as bargaining chip. For example, Norway or the EU would like to have a standardised MRV for all countries. On the other hand, SIDS are also pushing major developing countries toward stringent mitigation actions. But China is taking position to wait and see of what would be further decided at the climate negotiation forum. There are still different views on different type of NAMAs and which ones have to be MRVed, though China would stick to its position to only adhere to MRV for the supported actions (P11).

China has shown political willingness and has taken appropriate steps toward implementation of MRV. But first developed countries should have stringent emission reduction targets and take more actions to achieve those targets. On top of that, developed countries should fulfil their commitments to provide financial and technical assistance for developing countries. If the support for MRV is made available, then NAMAs MRV is justified. If not, economic development is still the most important thing for the developing countries (P4, P7, P11, P12).

While guidelines for MRV already exist, there are many other matters that need to be cleared up. For example, developing countries MRV should be of country-driven, bottom-up design. But there's ICA that is a top-down mechanism. If there is going to be a hybrid design, then its mechanism has to be clarified and defined. Regarding international verifier, it is deemed unnecessary to have that kind of scrutiny. Technically, it is not feasible to check on the reliability of data. It will only make sense to check about the methodology of acquiring data. If these matters could be cleared up and become acceptable before reaching a legally binding decision in 2015, then the perception of justification might be change (P4).

Chapter V

MRV at National Level: Indonesia

This chapter presents exhaustive explanation regarding MRV implementation in Indonesia. It starts by portraying the basic national circumstances of Indonesia that includes geographical, climatic and vulnerability of Indonesia, political situation and economic condition. It will then look at the national governance that includes climate governance and capacity, and environmental informational governance. Climate governance includes policies and actions of MRV which is explained in the context of climate change mitigation, and the institutional arrangements. While environmental informational governance includes analysis of data and information system in general and on environmental sector in Indonesia, and constraints on economy, politics, organisational and cultural sectors. In the last section, Indonesia's perspective on the feasibility and justification of MRV is explained alongside the importance of and interest in MRV implementation.

5.1. Basic National Circumstances

5.1.1. Geography, climate and vulnerability

Indonesia is the largest archipelagic country in the world. It consists of five major islands and about 30 smaller groups of islands. In total, there are about 17,000 islands of which only about six thousands are inhabited. Located in Southeast Asia, Indonesia lies at the intersection between two oceans, the Pacific and the Indian Ocean, and two continents which are Asia and Australia. The five main islands of Indonesia are Sumatra, Java, Kalimantan, Sulawesi, and Irian Jaya/Papua. Indonesia shares its land borders with Malaysia, East Timor and Papua New Guinea, and other neighbouring countries which are Singapore, Brunei, Thailand, The Philippines and Australia. Indonesia's total land area is 1,919,317 square kilometres. Included in Indonesia's total territory is another 93,000 square kilometres of inlands seas (straits, bays, and other bodies of water). The additional surrounding sea areas bring Indonesia's generally recognized territory (land and sea) to about 5 million square kilometres. Indonesian government also claims an exclusive economic zone which brings the total area to about 7.9 million square kilometres[31].

Geographically, Indonesia could be separated into three divisions: Greater Sunda Islands which lie on Sunda shelf and comprised most of the major Islands (Sumatera, Java-Madura, Sulawesi

[31] http://www.indonesiapoint.com/geography-of-indonesia.html accessed on 12 February 2013 at 22.30.

and Kalimantan), East Indonesia or Outer Islands which are Irian Jaya/Papua and its surrounding islands that lie on Sahul shelf, and Lesser Sunda Islands which comprised of the islands between the two first groups (Bali, Lombok, Maluku). The topography of Indonesia is predominantly mountainous with about a hundred volcanoes that are still active. The volcanoes' eruptions have caused atrocities up until recently, yet the volcanic ashes have made the fertile soils, which suited the agriculture sector especially in Java region[32].

Being passed by the equator, Indonesia is almost entirely tropical in climate, with the coastal plains temperature averaging 30°C, the inland and mountain areas averaging 26°C, and the higher mountain regions 23°C. The area's relative humidity ranges between 70 and 90 per cent. Winds are moderate and generally predictable, with monsoons blowing in from the south and east in June through September and from the northwest in December through March. Prevailing wind patterns interact with local topographic conditions and produce significant variations in rainfall. Western and northern parts of Indonesia experience the most precipitation since the north-and westward-moving monsoon clouds are heavy with moisture, resulting in rainfall measuring more than 2,000 millimetres per year. On the other hand, the islands closest to Australia like Nusa Tenggara and the eastern part of Java tend to be dry, with some areas experiencing less than 1,000 millimetres per year. The season in Indonesia is split into dry season from April to September which influenced by the Australian continental air masses and rainy season from October to March which is the result of mainland Asia and Pacific Ocean air masses[33].

As an archipelagic country, Indonesia is mostly prone toward sea level rise. Sea level rise and changing rainfall patterns, combined with extreme wave and high tide are threatening small islands in Indonesia. The coastal region experienced inundation, sea water intrusion to the ground water, land subsidence and erosion. High fluctuation between the dry and rainy season have increased Indonesia's vulnerability with heavy rainfall causing flood and landslide, and in reverse drought was putting strain to agricultural production due to scarcity of water. Prolonged dry season affecting water quality and quantity in the rivers and lakes, causing health and sanitation problems particularly to people living in the basin areas, the impoverished people dependent to the rivers as their water resources, and the elderly and young children. Increased temperature during the dry season has also caused urban heat island phenomena in big cities, recurrent forest fires and endangered wildlife and biodiversity in Indonesia. Higher frequency of extreme weather events have also occurred, such as El Nino and La Nina, which

[32] http://countrystudies.us/indonesia/28.htm accessed on 04 March 2013 at 09.22.
[33] http://countrystudies.us/indonesia/29.htm accessed on 04 March 2013 at 09.20.

caused significant impact in the form of massive high waves and storm surges in the northern and southern parts of Indonesia (MoE, 2010).

5.1.2. Political system

Indonesian history is said to begin in the 7th century, when Sriwijaya Kingdom in South Sumatera united the separate local kingdoms spread from Malay Peninsula to the eastern part of present-day Indonesia. In the early 1600s the Dutch began to grow large settlements on Indonesia's islands, and then ruled Indonesia for 350 years as Netherlands East Indies (except for East Timor which was ruled by Portugal). By early 20th century, Indonesia began movement for independence which peaked on Japanese occupation during World War II. On 17 August 1945, Republic of Indonesia was established.

In years following its independence, Indonesia struggled to govern itself and there were several attempts of rebellions or separatist activities. In 1949 the new republic adopted a constitution which established a parliamentary system, yet in 1959 the first President Soekarno returned to the constitution of 1945 that provide more presidential powers and take power from the parliament. This era of authoritarian government was known as "Guided Democracy", where Soekarno severed Indonesian relation to the western world and fastened its ties to Soviet Union and China. After an attempt of coup by the communist party in 1965, President Soekarno transferred political power to General Soeharto who became second President of Indonesia. Soeharto established what is called as "new order" to rehabilitated Indonesia's economy and rekindled ties with the western world. He ruled the country until 1998 when he was forced to step down after years of civil unrest and undisclosed cases of violation of human rights in some regions of Indonesia[34].

Today Indonesia is a democratic republic with a single legislative body that is the House of Representative which split into People's Consultative Assembly (Majelis Permusyawaratan Rakyat/MPR) as an upper body and House of Regional Representative (Dewan Perwakilan Rakyat/DPR) which is the lower body. The executive branch is led by the president which serves as both Chief of State and Head of Government. Indonesia is the world's fourth most populous country behind China, India and the United States, with more than 230 million people and around 300 ethnic groups.

[34] http://geography.about.com/od/indonesiamaps/a/indonesiageography.htm accessed on 04 November 2012 at 17.15

Indonesia is divided into administrative units in different level: national, provinces (regional level), cities and municipalities (local level). Based on Ministry of Home Affair (MoHA) Regulation no. 66/2011, currently there are 33 provinces, 399 municipalities, and 98 cities in Indonesia. Each provinces in Indonesia is headed by a governor, and divided into several cities/ municipalities. A city is headed by a mayor, and a municipality is headed by a regent. Each administrative level has its own legislative bodies, where a province has provincial parliament (DPRD Provinsi), a city has city parliament (DPRD Kota), and a municipality has municipal parliament (DPRD Kabupaten). From 33 provinces in Indonesia, 5 provinces have special status due to their historical or political importance, with the capital city Jakarta being one of them.

5.1.3. Economic condition

Indonesia has made significant progress in its economy. After the 1997-1998 Asian financial crisis, followed by the end of Soeharto's authoritarian ruling, Indonesian economy has returned to a pre-crisis level of real GDP, with annual economic growth rates between 4%-6%. This remarkable achievement was due to the government of Indonesia's decisive and swift actions in passing an adequate economic stimulus package that enabled accelerated recovery. The administration of current President Yudhoyono has introduced significant reforms in the financial sector by comprehensively restructuring the banking sector, reforming tax and customs system and fostering capital market development and supervision. The government also promoted fiscal conservative policies that resulting in reduction of national debts from 100% of GDP in 1999 to 26% of GDP in 2012, a fiscal deficit below 3 per cent and historically low rates of inflation. This lead to a relatively good macroeconomic condition, and the next global financial crisis of 2008-2009 did not slow Indonesia's economic growth[35].

Higher state revenue also gained from the contribution of its fast growing workforce, which has given birth to a strong and burgeoning middle class in Indonesia. Indonesia's workforce is growing for about seven thousand people each day, adding an estimated 21 million people to its workforce by over the next decade. This rate is second only to India as Asia's fastest growing workforce. Aside of making significant amount allocated to saving and investment, the trend of the middle class is that they are spending more on durable goods such as property, car, electronics, home appliances, clothing and many other goods. With easier access to low-cost financing and bigger employment opportunities, disposable incomes could rise by 11 per cent

[35] http://www.indexmundi.com/indonesia/economy_profile.html accessed on 27 January 2013 at 19.04.

annually over the next five years. This made domestic consumption accounts for two-thirds of Indonesia's GDP[36].

Investment growth in Indonesia is responsible for about a third of the GDP, both domestic and prominently foreign investment. The strong policy framework has facilitated investor's ability to plan ahead and to maintain confidence in the future that motivates more investments. Increased foreign investment and a rising middle class have kept Indonesia's economy afloat despite the turmoil in global markets. It is estimated that Indonesia's GDP growth will reach 6.5 per cent in 2013. Yet, leading up to the upcoming general election in 2014, Indonesia's business and investment will be under particular focus. Continued improvement of the regulatory environment and effectively communicating new reforms are important steps to sustain robust investment outlook and economic growth[37].

However, Indonesia still struggles with poverty and unemployment, corruption, a complex bureaucracy and regulatory environment, and unequal resource distribution among regions. In recent years, the Government of Indonesia (GoI) faced the on going challenges of improving Indonesia's insufficient infrastructure to remove impediments to economic growth, labour unrest over wages, and reducing its fuel subsidy program in the face of high oil prices. Indonesia also continued its efforts to alleviate poverty. With population living below the national poverty line decreased from 16.6% in 2009 to 13.3% in 2010 and the unemployment rate is at 7.14%, Indonesia is one of the top 10 countries with the quickest progress in human development in recent years. But with an HDI value of 0.6 in 2010, indicating a level of Medium Human Development, Indonesia still remains below the world and the regional average, positioned at 108 out of 169 countries and areas. About 60% of the population lives on less than $2 a day. Overall development in rural areas and prominently in the eastern provinces still falls behind considerably (Stiftung, 2012b).

5.2. Indonesia's MRV Policy and Implementation

5.2.1. Climate change in Indonesia: the importance of forestry sector

With its vast coastline and climatic systems that are susceptible to natural disasters, Indonesia is one of the countries that are most vulnerable to the negative impacts of climate change. According to OFDA/CRED International Disaster database, ten biggest natural disasters in Indonesia since 1900 that were directly or indirectly affected by climate change happened after

[36] http://www.usfunds.com/investor-resources/frank-talk/significant-growth-potential-for-indonesiae28099s-middle-class/ accessed on 23 June 2013 at 11.32.
[37] http://www.worldbank.org/en/country/indonesia/publication/indonesia-economic-quarterly-reports accessed on 15 February 2013 at 22.40.

the 1990s. Those disasters, consisting of droughts, forest fires, floods and subsequent vector-borne diseases outbreaks, have cost up to USD 26 billion, and caused countless fatalities throughout Indonesia (MoE, 2007). This extensive vulnerability made addressing climate change a critical national priority for Indonesia.

At the international and regional level, Indonesia has played an active role. Aside of continuously participating in climate negotiations and hosted the 13th Conference of the UNFCCC that resulted in Bali Action Plan, Indonesia is the home to Secretariat of ASEAN for Climate Change Initiative. Being estimated as among of the top emitters of GHGs, Indonesia realized that it has an important role in global mitigation efforts. Along with its vulnerability and active role, this realization made the government of Indonesia (GoI) recognised the need to take sufficient actions to tackle climate change. Climate change planning cannot and should not be performed separately from national economic development planning, thus mitigation and adaptation strategies must be integrated in all aspects of national, regional and local development planning (MoE, 2007).

Indonesia's rank among top GHG emitting countries is primarily due to its high emission from the land-based sector. The emission from land-use related activities was estimated to account for 60 to 85 per cent of its total GHG emission. High rates of deforestation, degradation of peat lands and forests degradation constitutes the key sources of emissions. Causes of deforestation were identified as conversions of forests to perennial plants like oil palm, shrubs and short-rotation pulpwood plantation; conversions of forest to annual cropland; energy and mining exploration in forest lands; conversions to exploit mineral resources; conversions to shifting cultivation lands with slash-and-burn methods; and conversion to urban lands and other infrastructure (Bappenas, 2010b). Figure 18 below shows the emission sources in Indonesia:

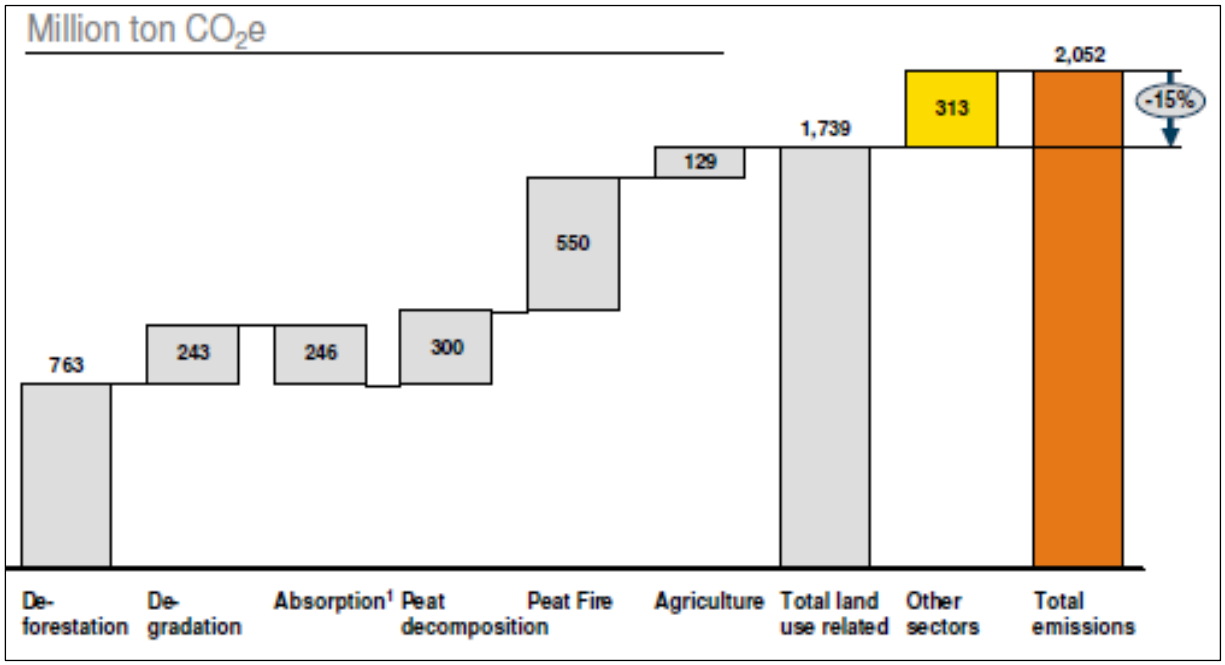

Figure 18. Indonesia's emission sources (Bappenas, 2010)

As the country with third largest forest area in the world, Indonesia' forestry sector role in the context of climate change is crucial for both national and global level. Forest has dual functions as carbon sink and as source of carbon emissions. As sink, forests play a critical part in regulating earth's climate through carbon cycle, removing carbon from the atmosphere as they grow, and storing carbon in leaves, woody tissue, roots and organic matter in soil. The world's forests absorb about one-third of CO2 released through the burning of fossil fuels each year. While deforestation and forest degradation account for about 10-15 per cent of global GHG emissions, the burning of peat land associated with forest clearing account for an additional of 3 per cent emissions. As a comparison, these emissions are greater than from the entire global transportation sector. The loss of forest cover also means a loss of forests natural capture and storage capacity, amplifying emissions from other sources. Though peat land forests cover only about 3 per cent of earth's land area, they store as much as one-third of all soil carbon[38].

Depending directly on climatic parameters rainfall and temperature, Indonesia's forest is highly vulnerable to negative impacts of climate change. Natural climatic effects interact with human-induced climatic factors such as land-use change and forest degradation process which are aggravated by higher temperatures and drier conditions. Such condition has implicated the lives of forest-dependent people and destabilises feedback systems and ecosystem services of forest area. Indonesia has lost approximately 1.7 million ha of its forest per year during the period of 1985-1997. The highest forest loss occurred during 1997-2000, reaching 2.8 million ha per

[38] http://www.cifor.org/fileadmin/factsheet/RIO+20_Factsheet%20-%20Mitigation.pdf accessed on 25 April 2013 at 17.50.

year. The latest data showed that net forest lost has decreased during 2000-2005, reaching about 1.09 million ha annually. Based on the statistic from the Ministry of Forestry in 2008, there is 77 million ha of critical land[39] all over Indonesia, of which 59 million ha are located in forest area and needs to be rehabilitated (Bappenas, 2010a).

Table 6. Indonesia's forest and non-forest lands (Tedjasukmana, 2010)

Indonesia lands in million ha									
	Forest lands							APL	Total
	Conservation	Protection	Limited Production	Production	Total Permanent Forest	Convertion Forest	Total forest land	Non Forest land	Total
Forest cover	15,2	23,0	18,8	22,1	79,1	11,0	90,1	8,3	98,5
Non-Forest cover	3,8	5,9	5,5	13,1	28,3	11,0	39,3	46,5	85,8
Data deficiency	0,7	0,9	0,5	0,5	2,6	0,3	3,0	0,6	3,6
Total	**19,7**	**29,9**	**24,8**	**35,7**	**110,0**	**22,4**	**132,4**	**55,4**	**187,8**
%	18	27	23	32	100				

In order to cope with this problem, National Development Agency (Badan Perencanaan Pembangunan Nasional/Bappenas) developed a set of mitigation strategy for forest sector that comprised of:

1. Sustainable Forest Management (SFM) that aimed to protect forests areas based on the functions: conservation forest, protected forests and production forests. This strategy includes curbing log harvesting encroachment, illegal logging and human-induced forest fires,
2. Reducing Emissions from deforestation and forest degradation (REDD) that facilitated land swap agreement and financing incentives to reduce emissions from unwanted degradation and unplanned deforestations,
3. Plantations, both on non-forest cover lands or as a rehabilitation of critical lands and peat lands, to increase carbon sink capacity.

Indonesia's initiative in taking these measures has led to growing interest from international communities. A bilateral partnership between the Government of Indonesia and the Government of Norway on shaping and encouraging the implementation of REDD+ in Indonesia has been launched (Boer et al., 2010). Both countries agreed through a Letter of Intent (LoI) that focused on Norwegian support to Indonesia's efforts on reducing emission from deforestation, land degradation and peat land conversion with up to USD 1 billion. The (+) in REDD+ entailed

[39] Critical land refers to a piece of land severely damaged due to loss of vegetation cove or loss of functions as water retention, erosion control, nutrient cycling, micro climate regulation and carbon retention. Based on its vegetation condition, the land could be classified as: very critical, critical, slight critical, potential critical and normal condition

the better management of standing forests, expanding tree cover through socially and environmentally responsible reforestation and restoration, putting cost and time effective strategies to conserve and enhance carbon stocks and mitigate climate change, and helps deliver a range of livelihood and environmental benefits that both people and ecosystems to adapt to climate change[40].

The concessions in the REDD+ agreement between Indonesia and Norway are in return of the moratorium of forest conversions. However, there are many problems with the scheme, namely that the moratorium was agreed to be on time-based of two years instead of performance-based, that the LoI is not legally binding, and worst, that it is not reducing deforestation. Forest destruction in Kalimantan is said to be continued in regions where coal concessions were already granted. While in Papua, deforestations happen under pre-existing logging concessions. There is also lack of clarity of the status of forest's functions, which created loopholes in the moratorium[41].

Indonesia is faced by challenges to fulfil the needs of its people and become self-sufficient in food production. It is also source of agro-industry product and bioenergy plantation. Thus expanding of agricultural land is deemed crucial to increase crop harvest in main food production such as rice, cassava, potato and corn, and commodities like coffee, cacao, sugar and palm oil. Agriculture sector is vulnerable toward the change of rain pattern, increased temperature and sea level rise for agriculture land in coastal area. GHGs emission from this sector which are CO2, CH4 and N2O are expected to be reduced through mitigation, which combined with adaptation programs that promote sustainable agriculture management (Bappenas, 2010b).

In Indonesia, the energy sector consists of four major sub-sectors, namely transportation, industry, electric power and commercial and residential. The emission from energy sector is estimated to be 15 to 25 per cent of Indonesia's total emissions. In order to reduce GHG emissions from the energy sector, Indonesia needs to properly address its heavy reliance on fossil fuels like oil, coal and natural gas that are primary contributors to CO2 emissions. Aligned with the national commitment of 26 % emission reduction below BAU, the emission reduction from energy sector is targeted to reach 16% by 2025, through reducing dependency to fossil fuel, promote renewable energy and implementing energy mix policy. However, the energy sector must be managed carefully as it is of crucial importance to the Indonesian economy,

[40] http://www.cifor.org/fileadmin/factsheet/RIO+20_Factsheet%20-%20Mitigation.pdf accessed on 17 June 2013 at 22.35.
[41] http://www.redd-monitor.org/2012/05/04/deforestation-in-indonesia-continues-despite-the-moratorium/ accessed on 17 June 2013 at 21.17.

responsible both for earning export revenue and for fulfilling the need for domestic energy (MoE, 2010).

5.2.2. Indonesia's Policies and Actions to address Climate change

The National Long-Term Development Plan (Rencana Pembangunan Jangka Panjang Nasional/RPJPN) for Years 2005-2025 highlights the importance of sustainable development which will be reached by keeping the balance between utilization, sustainability, existence, and usefulness of natural resources and the environment by protecting the function, capacity and the comfort of living in the present and the future through balanced land use for settlement, social economic activities and conservation; augmenting the economic utilization of natural resources and environment sustainably; improving the management of natural resources and the environment to support the quality of life; providing the wonder and comfort of life; and enhancing the preservation and utilization of biodiversity as basic capital of development (Bappenas, 2010b).

This Long-term Development Plan was being break-downed into five-year Medium-term Development Plan (Rencana Pembangunan Jangka Menengah Nasional/RPJMN) and Annual Government Work Plan (Rencana Kerja Pemerintah/RKP)[42]. Climate change has been integrated into these development plans. For example, RPJM 2005-2009 focused on climate-related disasters, so climate change was addressed through the Disaster Risk Reduction Program, which includes meteorological disasters, as one of the priority program in RKP in 2008. As the consequence, budget allocation for the program of Meteorological Early Warning System (MEWS) in the Meteorology, Climatology and Geophysical Agency (Badan Meteorologi, Klimatologi dan Geofisika/BMKG) has been augmented to improve the national early warning system for climate variability in Indonesia.

Climate Policy

In preparation toward the then UNFCCC COP 13 meeting in Bali in 2007, Indonesian government published National Action Plan on Climate Change (Rencana Aksi Nasional Perubahan Iklim/RANPI) as an initial guidance for a multi-sectoral coordination effort designed to address the challenges of climate change. The plan stated that as a country that is highly vulnerable toward the negative impact of climate change, Indonesia is determined to take actions to reduce its GHG emission in energy and LULUCF sector, and to enhance its carbon absorption. However, the plan further stated that Indonesia will still prioritise its economic

[42] http://jdih.bpk.go.id/wp-content/uploads/2012/02/UU_no_17_th_2007.pdf accessed on 06 December 2012 at 14.30.

development, with a hindsight that prosperous people will be easier to have their awareness raised to look after their environment. Thus, the development strategy will be based on *pro-growth, pro-poor, pro-job and pro-environment* principles (MoE, 2007).

In order to bridge the current and subsequent development plan, particularly in formulating the mid-term national plan and the annual work plan to be more responsive in addressing sectoral and cross-sectoral issues related to climate change, Bappenas, in collaboration with various government institutions developed The National Development Planning: Indonesia's Response to Climate Change or simply known as the Yellow Book. This document served as reference for the international community to support climate change-related policies, programs and activities of the priorities sector of mitigation and adaptation that include the agriculture, forestry, energy and mining and ocean and coastal area[43].

In 2009, Indonesia has pledged for emission reduction target of 26% below business-as-usual scenario by 2020 that qualifies as unilateral NAMA, while the target is up to 41% with international support. These two sets of target are in line with the distinction between unilateral NAMAs and internationally supported NAMAs, with possibility to offset credit for the emission reductions achieved under the second category. There are five sectors initially by which the target is to be achieved namely agriculture, forestry and peat land, energy, industry and waste sectors. Later, the sector groupings are altered following the classification in the 2006 IPCC guidelines into three categories which are AFOLU or land-based sectors, energy which includes IPPU and transportation sector, and waste sector.

Between year 2009 and 2010, Indonesia has also developed and established reports of Technology Needs Assessment (TNA) and Vulnerability Assessment (VA) with support from GIZ as development partner and GEF on financing. Community-based VAs were also being developed in local areas, highlighting the differences in characteristics and needs and potential adaptation actions of the assessed regions.

Bappenas established ICCSR or the Indonesian Climate Change Sectoral Roadmap in 2010. This document confirms the government recognition that tackling climate change is an integral part of the developmental challenge that is faced by the country. The ICCSR is meant to provide inputs for the medium-term development plan for the period of 2010-2014, and for the subsequent long-term national development period until 2030. It laid emphasis on the challenges and potentials for mitigation and adaptation in forestry, energy, industry, agriculture, transportation, coastal area, water, waste and health sectors. ICCSR provided

[43] https://crawford.anu.edu.au/accpforum/pdf/ppp/7_Melisa.pdf accessed on 18 March 2013 at 16.27.

detailed policy guidance and mainstreaming tool for the sectoral and cross-sectoral development programs in order to take up considerations of climate change into all aspects of development planning (Bappenas, 2010b). Figure 19 below shows the integration of climate mitigation and adaptation into national development planning:

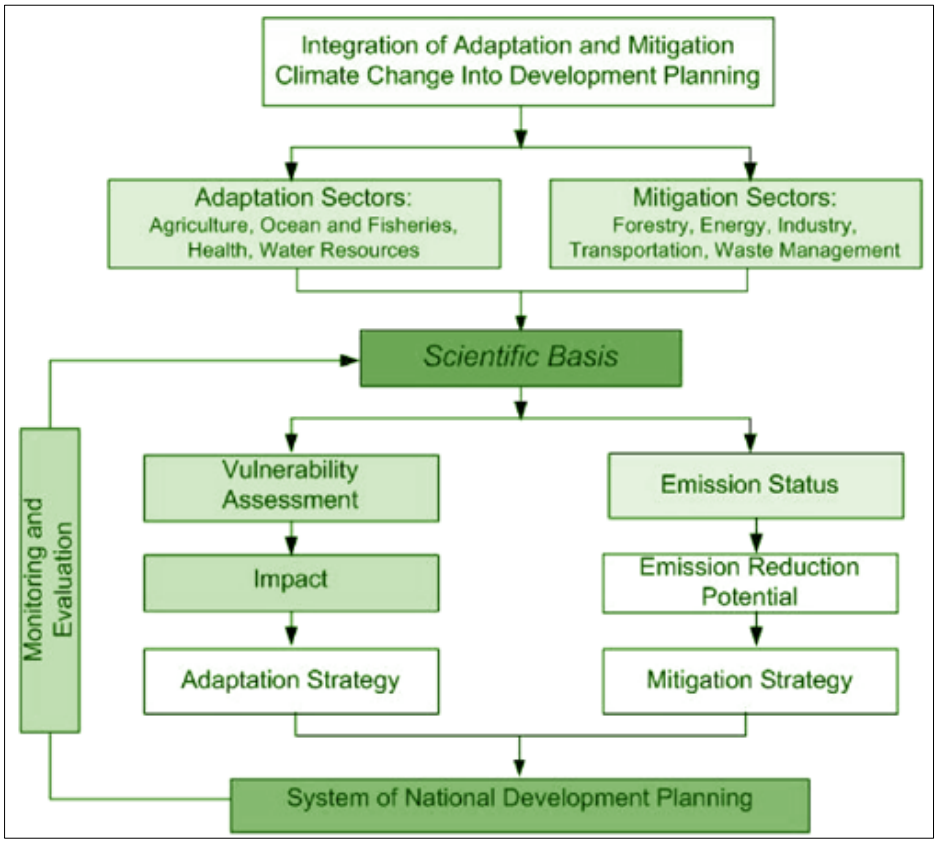

Figure 19. Integration of Climate Mitigation and Adaptation into Indonesia's development plan (Bappenas, 2010)

To support and accelerate the implementation of climate change programmes, the Government of Indonesia established The Indonesian Climate Change Trust Fund or ICCTF that aimed to be a platform of alternative financing for climate change mitigation and adaptation programmes. The ICCTF has five specific objectives namely (i) to facilitate and accelerate investment in renewable energy and efficiency and simultaneously reduce GHG emissions from the energy sector, (ii) to reduce emissions from deforestation and forest degradation and stabilise carbon stocks through sustainable forest and peat land management, (iii) to reduce vulnerability in coastal zones, agriculture and water sectors, (iv) to bridge the financial gaps necessary to address climate change mitigation and adaptation and (v) to increase the effectiveness and impact of external

finance for climate change programmes. The ICCTF can be accessed by line ministries and other stakeholders to support the implementation of climate change programs[44].

Since the national emission reduction target is based on business-as-usual (BAU), the Indonesian government is developing a quantified reduction target. According to the GHG Inventories, Indonesia's net emission is expected to increase from 1.76 to 2.95 GtCO2e between year 2000-2020. This estimation was based on the measurement of historical emission between year 2000-2005, and a projection of BAU scenario from 2005-2020. Figure 20 below shows the quantified emission calculation and projection per sector:

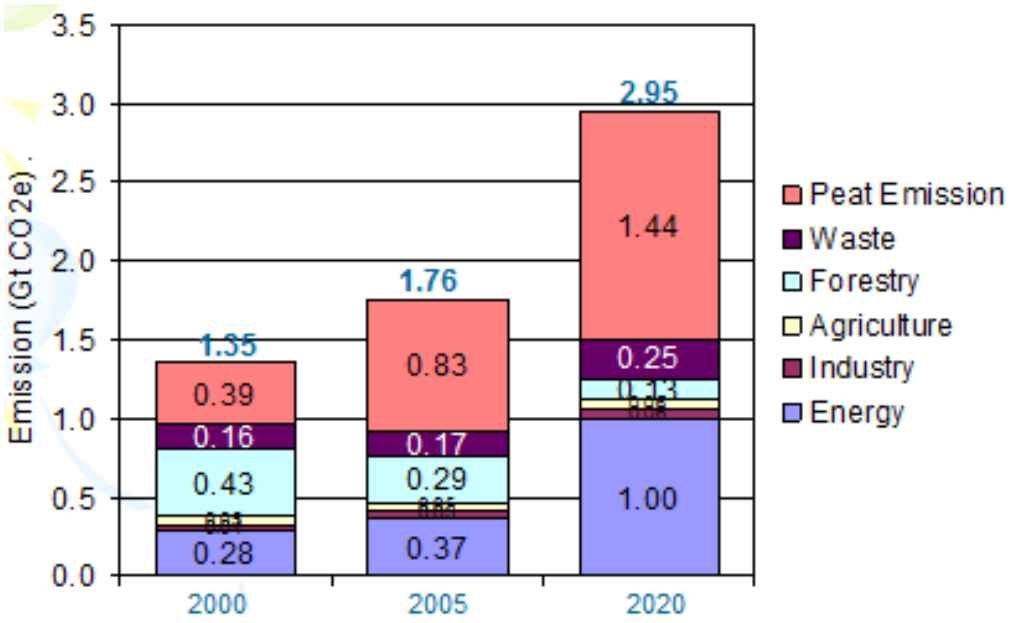

Figure 20.. Indonesia's net emission projection per sector (Source: MoE, 2010)

In 2011, President Yudhoyono issued Regulation No. 61/2011 that mandated the line ministries in the targeted sectors to incorporate climate mitigation actions and its monitoring system in their development plan, and Presidential Regulation No. 71/2011 with mandate to establish a greenhouse gas inventory system at national level. Following the Presidential Regulation No. 61/2011, Bappenas was coordinating the sectors to develop the National Action Plan for Reducing Greenhouse Gas Emissions (Rencana Aksi Nasional Penurunan Emisi Gas Rumah Kaca/RAN-GRK). The GoI lists three principles in the RAN-GRK, stating that the mitigation actions:

1. should not hinder economic growth, and should prioritize people's welfare, especially in with regard to energy resilience and food security,
2. support protection of poor and vulnerable communities, including environment conservation in the framework of sustainable development and

[44] http://icctf.or.id/ accessed on 18 May 2013 at 16.35.

3. consist of core activities to reduce emissions and supporting activities to strengthen the policy framework.

The RAN-GRK consists of about 70 programs which are distributed across five sectors and it shows what type of resources will be needed for implementation, new kinds of policies that need to be formulated as well as the institutional settings required for successful implementation. To implement the RAN-GRK at local level, local governments have developed their own RAD-GRK (Rencana Aksi Daerah Penurunan Emisi Gas Rumah Kaca) as local action plan. Table 7 below shows the quantified emission reduction target per sectors and the related agencies:

Table 7. Indonesia's quantified emission reduction target per sectors (MoE, 2010)

Sectors	Emission Reduction Plan (Giga ton CO2e)		Agency
	26%	15% (total 41%)	
Forestry and Peat	0.672	0,367	Ministry of Forestry, Ministry of Environment, Ministry of Public Works, Ministry of Agriculture
Waste	0.048	0.030	Ministry of Public Works, Ministry of Environment
Agriculture	0.008	0.003	Ministry of Agriculture, Ministry of Environment
Industry	0.001	0.004	Ministry of Industry
Energy and Transportation	0.038	0.018	Ministry of Transportation, Ministry of Energy and Mining, Ministry of Public Works
	0.767	0.422	

Aside from RAN-GRK, Indonesia in 2010 has submitted its voluntary NAMAs to the UNFCCC within the framework of the Copenhagen Accord, which are (i) Sustainable peat land management, (ii) Reduction in rate of deforestation and degradation, (iii) Development of carbon sequestration programs in forestry and agriculture, (iv) Promotion of energy efficiency, (v) Development of alternative and renewable technology, (vi) Reduction in soil and liquid waste and (vii) Shifting to low emission transportation modes[45]. While a NAMA on Sustainable

45 http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/indonesiacphaccord_app2.pdf accessed on 27 November 2012 at 19.55.

Urban Transport Initiative has been submitted under the registry for mitigation actions looking for support of implementation[46].

Institutional arrangements

With multi-sectoral approach in tackling climate change, there are various institutions and agencies involved in climate change policy planning and implementation. The climate mitigation actions is governed by National Development Agency (Bappenas) for RAN-GRK, while Ministry of Home Affairs (MoHA) is responsible in monitoring the implementation of RAD-GRK by local governments. Sectoral mitigation actions are involving the Ministry Energy and Mineral Resources (MEMR), Ministry of Finance (MoF), Ministry of Agriculture (MoA), Ministry of Forestry (MoFor), Ministry of Transportation (MoT), Ministry of Public Works (MoPW), Ministry of Environment (MoE) and Meteorology, Climatology and Geophysics Agency (BMKG). On adaptation, Ministry of Health and Ministry of Ocean and Fishery are involved to governed climate change-related impacts on their respective sectors. All of these institutions and actions are coordinated under the Coordinating Ministry of Economy and Coordinating Ministry of Public Welfare.

Apart of its role in sectoral mitigation strategy, MoE is also responsible in coordinating and developing national MRV system and acting as Designated National Agency (DNA) to develop National Communication. To strengthen the implementation of the climate change actions and the position of Indonesia in international climate regime, the GoI established the National Council on Climate Change (Dewan Nasional Perubahan Iklim/DNPI) to act as focal point in climate negotiation forum. DNPI functions include formulating national policies, strategies and programs on climate change which include adaptation, mitigation, MRV, technology transfer, capacity building and financing[47]. On the other hand, MRV for the REDD+ Initiative is governed under Presidential Working Unit for Supervision and Management of Development (Unit Kerja Presiden Bidang Pengawasan dan Pengendalian Pembangunan/UKP4), along with its REDD+ taskforce.

Recently, the GoI has established the Indonesia Climate Change Center (ICCC) as an independent body to utilise and coordinate scientific community and technical input from research centres within line ministries, universities and research institutes, and from international experts to

46 https://unfccc.int/files/cooperation_support/nama/application/pdf/nama_implementation_indonesia_sustainable_urban_transport_initiative.pdf accessed on 26 November 2012 at 19.20

47 http://dnpi.go.id/portal/en/ accessed on 15 May 2013 at 23.17.

address climate policy priorities[48]. There are also the role of Secretariat of RAN-GRK to manage domestic mitigation actions, Secretariat to the ICCTF for climate finance and World Agroforestry Centre (ICRAF) in land-based sector.

Under the coordination of the Ministry of Agriculture, the GoI has also established the Research Consortium on Climate Variability and Climate Change to accelerate the development of mitigation and adaptation technologies. The GoI is in the process of establishing Indonesia's National Carbon Accounting System (INCAS) based on Australia's system but tailored to Indonesia's unique circumstances. In addition, Indonesia is developing Indonesia's Forest Resource Information System (FRIS), a comprehensive and transparent information management system to support effective planning and forest management decision making for forest lands in Indonesia. (SNC, 2010)

5.2.3. Indonesia's MRV Policies and Implementation

Following the decision in the Copenhagen Accord, Indonesia realized the need to develop an MRV system based on the improved and strengthened existing monitoring and evaluation system. At the same time, the European Commission is initiating a scoping study aimed at understanding and exploring the needs of developing countries with regards to enabling activities for mitigation, MRV and GHG inventory. This study is part of the support from the EU for capacity building in those three areas, and being implemented in five countries which are Mexico, Indonesia, Peru, Thailand and Kenya. The study aimed at providing general recommendations on the needs and possible shaping of capacity building programs applicable to all developing countries, and resulted on the reports on the gap analysis of MRV system implementation in Indonesia (PAKLIM, 2011).

The existing system in Indonesia is called Monev or M&E, stands for Monitoring and Evaluation. Under this system, all programs implemented by government institutions and agencies are subject to review by the Inspectorate Generals for performance achievement of programs, and by Agency for Financial Audit (Badan Pengawas Keuangan/BPK) for financing of programs. Align with the RAN/RAD GRK, Bappenas is improving the M&E system into MER, short for Monitoring, Evaluation and Reporting (Pemantauan, Evaluasi dan Pelaksanaan/PEP). This MER system is including emission accounting aside of the performance and financial accounting. Currently, Bappenas is conducting socialisation of the MER to line ministries and local governments (Bappenas, 2013).

[48] http://iccc-network.net/en/about-us/who-we-are

The MRV system then will be based on this MER, with taking into consideration of NAMAs, NCs, BUR and ICA processes. Based on the government regulations No 61/2011 on National Mitigation Actions (RAN-GRK) and 71/2011 on National GHG Inventory, MRV will be focused on both elements. The domestic MRV system will be governed under new agency, which composition is still under discussion. This envisaged MRV Agency should have the technical and management capabilities to undertake planning and management of MRV processes and overall QA/QC of the MRV components. This Agency will coordinate the activities related to various MRV components but will not actually perform the elements of MRV like taking measurements or estimating emissions. Instead, the Agency will function in an oversight capacity, streamlining and collating the various activities (NCCC, 2012).

At present there is no system in place for QA/QC for the GHG emissions data. The Bureau of Statistics and several other agencies that are responsible for collecting data from local governments and private companies have set up procedures for data quality checking. Ministry of Environment as the sector responsible to establish National GHG Inventory System (Sistem Inventarisasi Gas Rumah Kaca Nasional/SIGN) will further develop this QA/QC systems. The overall objective of SIGN is to strengthen the capacity of sectors and local governments in order to improve the quality of the GHG inventory for the development of a sustainable inventory management system. There are three priority focus areas under SIGN (MoE, 2013):

1. Improvement of methodologies, activity data and emission factors;
2. Strengthening institutional arrangements, their functions, and operations of archiving, updating and managing of greenhouse gas inventories; and
3. Increasing awareness of local governments on the importance of the National GHG Inventory for developing mitigation strategies.
4. Increasing the capacity of designated personnel of the GHG Inventory within each sector for developing and managing the GHG inventory.

Figure 21 below shows the function of of GHG inventory in estimating baseline for the mitigation actions in meeting the national emission reduction target:

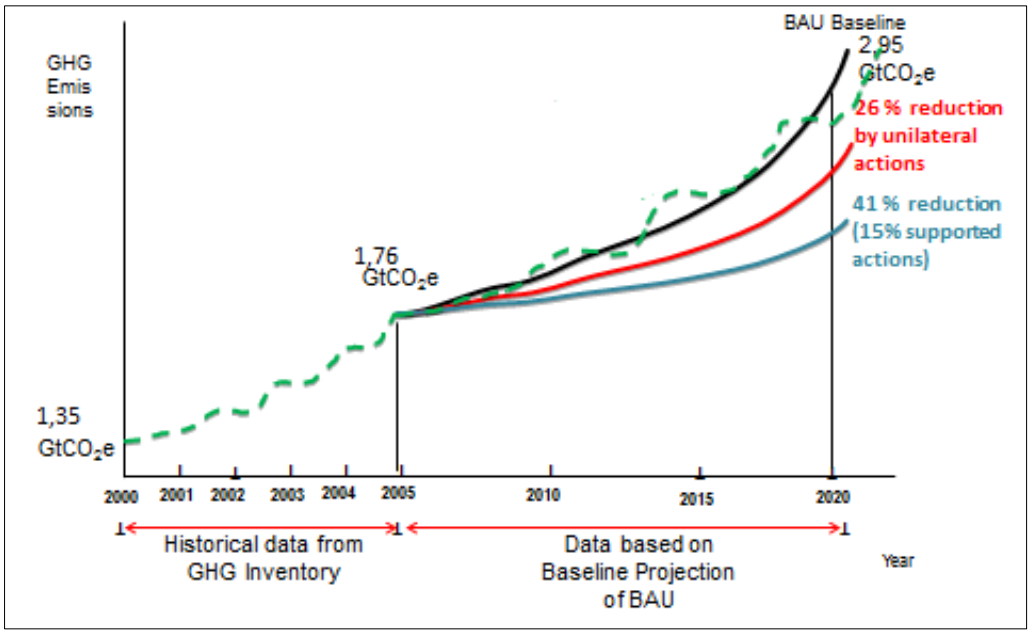

Figure 21. Role of GHG Inventory to determine baseline for mitigation strategies (MoE, 2013)

Figure 22 below shows the implementation of GHG Inventory among related institutions and agencies within the targeted sectors:

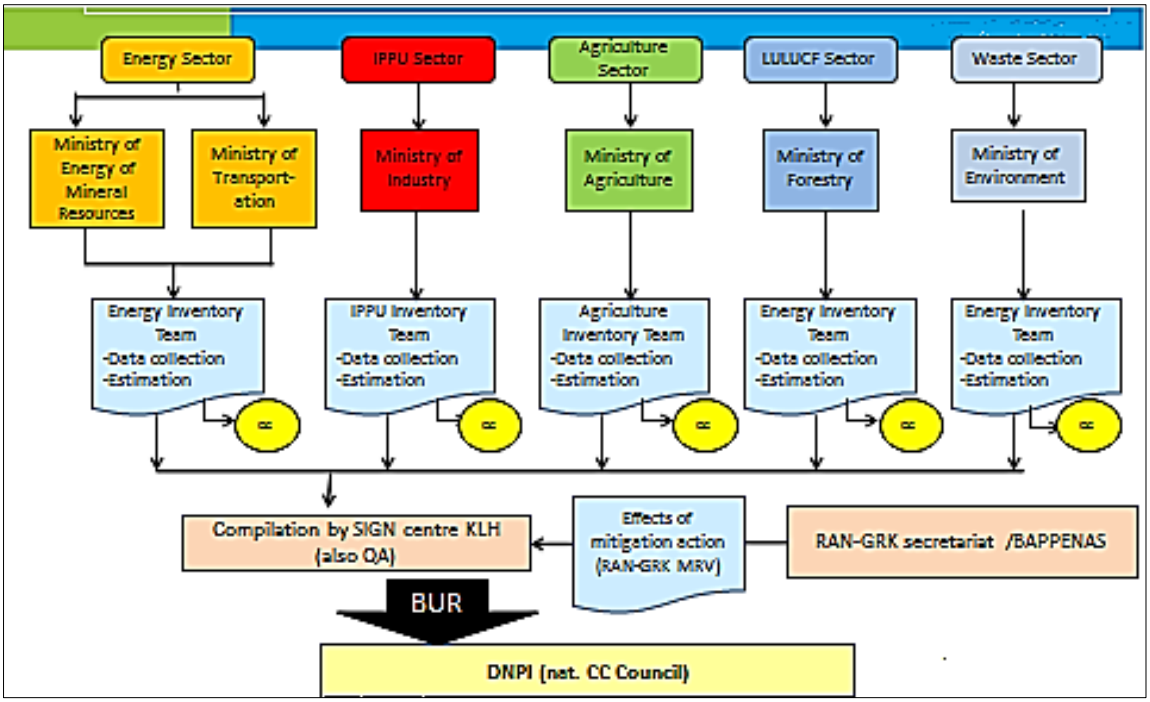

Figure 22. GHG Inventory and QA/QC system within sectors (Bappenas, 2013)

At present, the GoI led by Bappenas and MoE, with support from GIZ as the development partner, are formulating the national MRV system. Significant progress has been achieved, yet many things are needed to be further discussed and resolved. One of the progress being that

Indonesia has formulated the aspects and scope of each the M, R and V, which has not yet existed at international level. The subsequent three figures below show the proposition on MRV system for Indonesia, which are the scope of MRV, concept of MRV related to national mitigation actions and registry system, and structure of agency for MRV and NAMAs Registry:

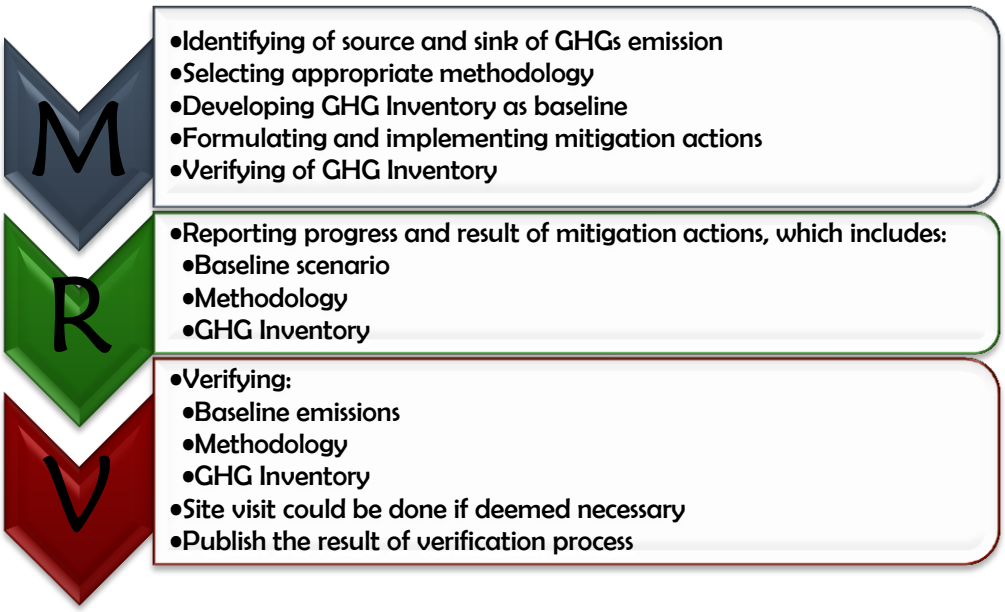

Figure 23. Scope of work of the MRV system (Bappenas, 2013)

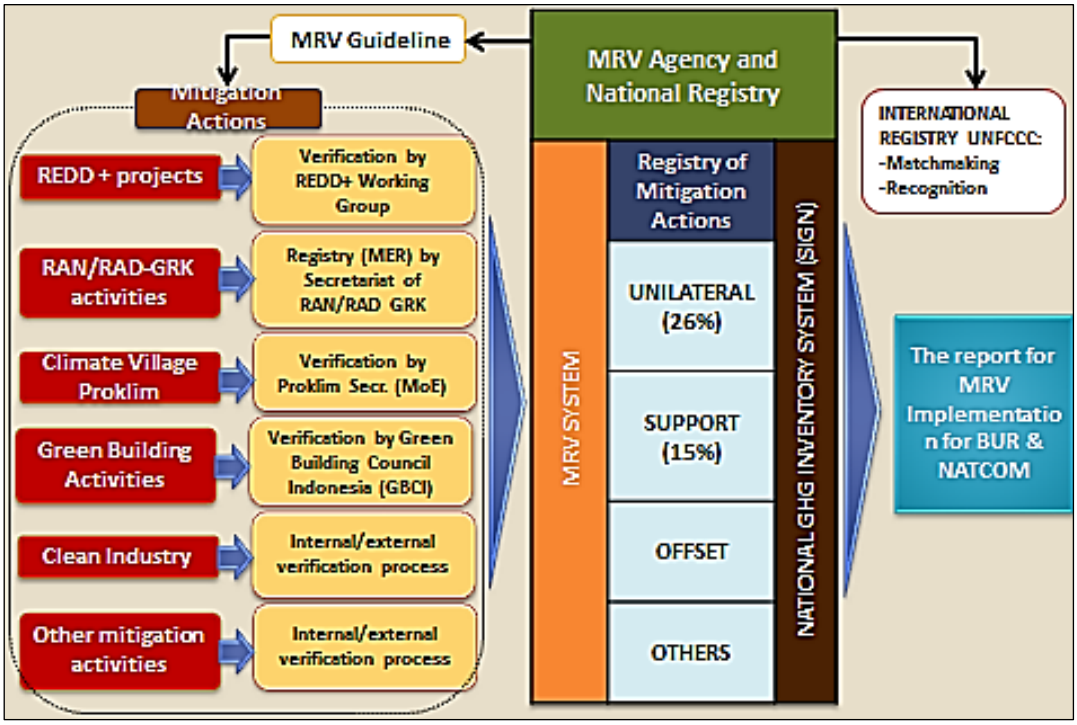

Figure 24. MRV concept related to national mitigation actions and registry (MoE, 2013)

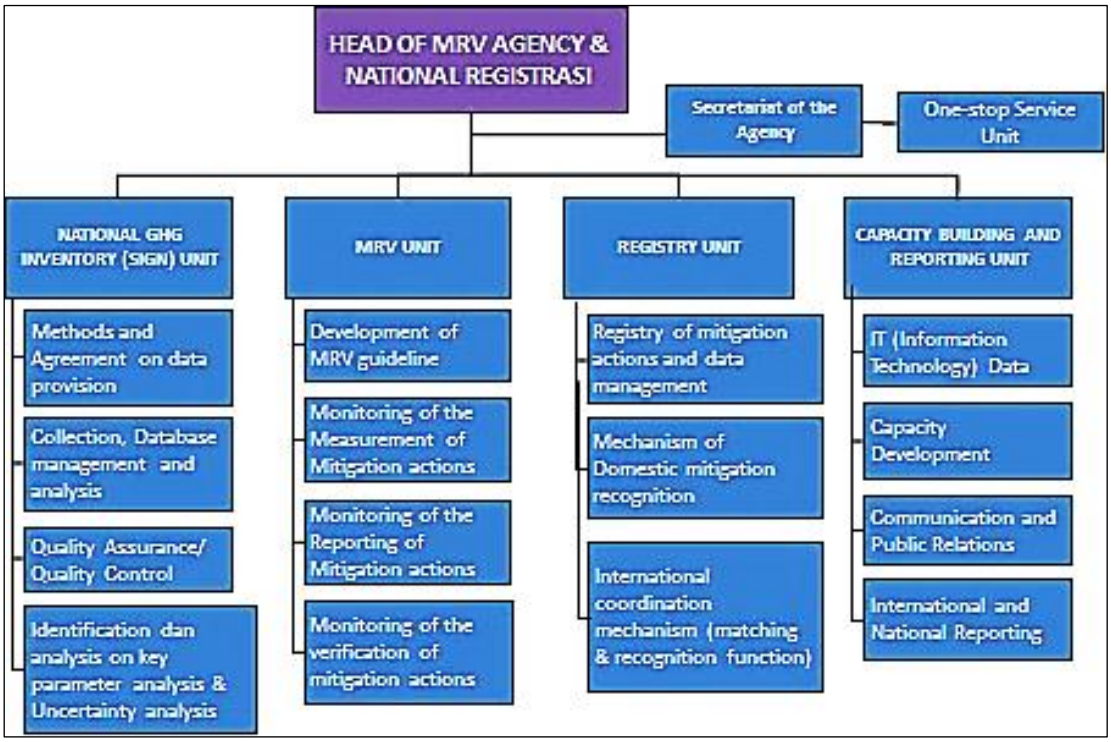

Figure 25. Structure of MRV Agency and National Registry (MoE, 2013)

Indonesia has produced and submitted two national communications, which were developed with support from UNDP as the implementing agency of the GEF. Currently, Indonesia is in the process of preparing for the third NC along with BUR. There is already allocated support provided for the development of these reports. For the development process of NCs, there was an ad hoc team comprised mainly of consultants. But for BUR development it will not work the same way, since government is the one who should develop it, or at least the role of government should be dominant while experts and consultants should only function as subsidiary. The difference between BUR and NC is that BUR only covers mitigation and GHG Inventory, while NC coverage includes national circumstances and adaptation actions.

5.3. National Circumstances for MRV implementation

5.3.1. Climate capacity

The reformation era in Indonesia was marked by the change in the governance system into decentralisation which was regulated by act No. 22/1999 and reaffirmed by act No. 32/2004. The vast geographic condition with numerous islands, various provinces and subsequent local units in Indonesia have caused a complication in coordinating within government, either horizontally between central and local governments, or vertically among the same level of governments. With the decentralized system that allows provincial and local governments to manage their own area with own set of regulations and policies, it is a difficult task for the

government of Indonesia to incorporate the national emission reduction target and mitigation policies down to the local levels. There are also different level of awareness and political will among the provincial governors for example, or simply different interest due to distinctive characteristics and needs of the provinces and regions .

With the increasing trend of climate hazards frequency and intensity, the most affected group will be the poorest of the society who are more exposed and least resilient. The capacity of this group to adapt to extreme climate events is limited due to their limited resource availability and access to climate information and technology. It is likely that their reliance on national and public assistance from government will also increase. Therefore, improving access to a diversified set of incomes and resources is a key method to improve climate capacity. This is closely linked with poverty reduction which is essential to help the poor and vulnerable communities to become resilient to natural climate variability and human induced climatic change (MoE, 2007).

The GoI is improving the knowledge and building capacity on the mainstreaming and implementation of mitigation and adaptation strategies at all levels of the society through publications, seminars, trainings and socialisation programs. Supported by development partners and international donors like GIZ from Germany, JICA from Japan, DANIDA from Denmark, DFID from UK, US, Australian and Norwegian governments, studies and researches were conducted on mitigation and adaptation potentials in Indonesia. Furthermore, to promote information sharing related to climate, many agencies have established a web-based climate information system (MoE, 2010).

5.3.2. Environmental Informational Governance in Indonesia

Good governance has become a concern in developing countries. From its experience, the governmental system in Indonesia during the 32 years or new order regime is a far cry from good governance value. The governmental system was centralistic, closed and non-participatory by the general public, with all political powers were in the hands of the President and his cronies. Within such system, information regarding governments operations, budgetary, and other matters that are of public interest is either unavailable, inaccessible, or unreliable (Agus Pramusinto, 2009)

The reformation era and decentralisation have brought significant change to the system. Public were demanding for information transparency and higher participation in the governmental system. Yet decentralisation brought negative governing practices conducted by local government officials like rampant corruption, high inefficiency and policy-making process that

do not take into account the interest of the people. The widespread corruption is worsened by the lack of transparency in government management and absence of citizen control over public policy process[49].

The GoI then introduced and promoted government transparency and accountability both at central and local level. As one of eight founding members of the Open Government Partnership (OGP), Indonesia is trying to play bigger role in seeking to achieve better governance by providing access to information, increasing government transparency and strengthening public participation. The informational governance in Indonesia has been improved by the establishment of Open Government Indonesia (OGI) based on law No. 14/2008. The law stated that government institutions and non-government organisations whose operations are funded by national budget are required to disclose information regarding its policies, financial flow and operations to be accessed by general public. The information provided is divided into regular publication, one-time publication and by-request publication. Line ministries, institutions, agencies and regional, provincial and local governments have provided the information through the information division within each office and also via official websites[50].

On environmental information governance, the state of data collection in Indonesia is still weak with lack of capacity, standardised mechanism, and most importantly, awareness of the importance of a reliable data. So even if environmental data is available, not all existing data is sufficient. Data accuracy is also weak, for there are often inconsistencies between national and local data, or between different sectors on the same data. Since the data quality is low, policy makers prefer to use numbers than data. These numbers could be created, or just based on assumptions. The used of assumption-based numbers has caused an unrealistic planning for future environmental strategy (P2).

Regarding data processing and flow, the environmental data and information were somewhat utilized in policy-making process (P13). Yet there exist shortfalls and different problems among sectors. For AFOLU sector, specific expertise and sophisticated technology are needed in order to collect and process data (P2). While in industry sectors, companies were often confused by overlap of reports that are required to be made. For example, the companies in Pulp and Paper need to make report to its association and to Ministry of Industry regarding its activities, to Ministry of Trade regarding its sales and production, but since their activities are related to agroindustry they also required to report to Ministry of Forestry (P5). On top of that, there's

[49] http://unpan1.un.org/intradoc/groups/public/documents/EROPA/UNPAN027462.pdf accessed on 28 December 2012 at 22.46.
[50] http://opengovindonesia.org/ accessed on 25 April 2013 at 19.07.

also PROPER requirement by Ministry of Environment, and AMDAL UKL/UPL[51] assessment local environmental agency (P13). The Ministry of Environment already has a clearing house of information and reporting for environmental problems. But responses over these reports, if exist at all, were usually slow due to lack of capacity and supporting enforcement (P10).

On the production of environmental information for general public, the MoE has developed two National Communications and GHG Inventory that have been submitted to the UNFCCC, and the MoE also has published the reports of the State of the Environment (Status Lingkungan Hidup Indonesia/SLHI) since 2002. These reports were launched formally to other ministries, agencies and related stakeholders, and also have been made available for general public via MoE's website[52].

5.3.3. Gaps, constraints, opportunities and challenges in implementing MRV

In spite of the many problems faced in the economic growth, Indonesia does not seem to have significant barriers in climate change financing (P14). It is true that Indonesia is looking for support for its mitigation and adaptation actions, and also for the establishment of MRV system. But the political will already exists and as long as there are supporting regulations for budget allocation, Indonesia is considered sufficient enough to build a good system (P2). Yet there is clash amongst political parties and tendency that all parties want to hold power. The ruling political party decides which policy will pass as legislation and which will not. An example is the regulation about fuel subsidy. Government has pushed hard to pass the regulation, yet since the majority of political party in the House disagreed, the implementation is delayed. So changing in Chief of Government can disrupt policies implementation, if the said policies are considered as not of national interest or priority any longer (P13).

Constraints exist mainly on institutional and organisational arrangements (P14). There is overlap and confusion in tasks and functions among sectors. Institutional structure with roles and mandates for MRV and mitigation is not yet clearly defined. And there is a competition among institutions where they are creating their own requirement and guidelines of MRV instead of synchronizing, which could lead to double counting or data that are incomparable. Sectors are often reluctant to utilised data and information from other sector, while reversely one sector may not want to share data and information to other sector for the matter of confidentiality and fear of misuse. This also happens between central and local government, and between public and private sector. For example, Riau provincial government cannot access the

[51] AMDAL is short for Environmental Impact Assessment, while UKL and UPL stand for Usaha Pengelolaan Lingkungan Hidup dan Usaha Pemantauan Lingkungan Hidup respectively.

[52] http://www.menlh.go.id/?s=SLHI accessed on 18 July 2013 at 19.37.

information on how much oil produced by oil companies in Riau province since the refinery data is reported directly to line ministry at central level (P5).

There are also barriers in cultural aspect, where Indonesians are regarded as hard to coordinate, inefficient and do not appreciate the importance of and accountability of data (P13). Indonesians are also difficult to follow standard operating procedures (SOP), so for example in measurement, the measured data is not reliable due to not following procedure in in the measuring process and this led to inconsistency of data for the same program/project. The problem of confidentiality arose from the careless data handling particularly in terms of ethic and recognition of data source (P2, P14).

Gaps exist on technical problems, where expertise and capacity to measure existing and estimating future emissions are not yet present in the key institutions. Level of understanding of NAMA at local government and sectors are either different or still limited resulting in different degrees of willingness toward MRV implementation. Understanding and capacity for defining baseline as reference to measure the effectiveness of NAMA implementation is still lacking. Particularly for MRV, there is yet formal institutional mechanism to allow for regular transfer of activity data for the elaboration of reliable national GHG inventories; high uncertainty of activity data particularly for non-energy sector; inconsistent data; no standardised system for QA/QC among sectors; and poor data archiving system particularly at local level (P2).

MRV entails not only issues of a mere quantitative nature such as GHG emissions and removals, but also financial assistance, capacity building and technology transfer. Challenges then remain on how to raise awareness and capacity to do MRV; how to build comprehensive system that can accommodate MRV not only for actions and inventory, but also for supports of financing, capacity building and technology transfer, and how to integrate and improved current M&E system into MRV as required by international standard (P14).

In spite of the gaps and challenges, MRV is perceived as an opportunity to enhance and upgrade existing MER system in Indonesia. The arrangement among the many sectors, institutions and agencies in MRV could also improve, so that the mutual understanding and trust built will enables easier harmonisation. Lastly, the task and function of institutions could also be clarified, like right now Bappenas has MER for RAN/RAD-GRK, MoE has SIGN centre, UKP4 has REDD+ taskforce and own MRV mechanism; these should be synchronised in order to avoid confusion and overlap (P2, P10, P13).

5.3.4. Role of non-state actors

Non-state actors play a rather significant role in MRV implementation in Indonesia. Companies already have their own monitoring and verifying system that are mostly comprised of QA/QC of product and production system, but has not incorporated emissions accounting. This system are done voluntarily and intended for company's usage. However, there are businesses that have taken some form of MRV for various reasons. Some companies has achieved ISO 14062 on environmental standard and performance, while larger or multinational companies have done accounting and made reports to the World Business Council of Sustainable Development (WBCSD) for international recognition on their sustainability (P5).

Businesses usually have market concern and are looking for incentives apart of the awareness of necessity for efficiency. The Ministry of Environment has established PROPER (Program Penilaian Peringkat Kinerja Perusahaan) which is an evaluating and assessment mechanism for companies by the MoE to promote compliance of companies toward cleaner production by incentive and disincentive in reputation. Based on the performance assessment, companies are given rank represented by colours which are gold, green, blue, red and black. Companies that are not fulfilling the criteria and being marked as "red" or "black" are given warning and being named-and-shamed for public disclosure (P13).

Presidential Regulation no.71/2011 has given mandate to high emitter companies to do inventory, but it's still under process of determining the threshold for the companies that belong in such criteria. Subsequently, there are demands now from businesses so that the government created a robust MRV system with clear guidelines, so as they don't have to make several accounting and reporting mechanisms to fulfil this obligation (P5).

Overseas-based aid organizations, international- and local-based NGOs and other social enterprise on environment have been rigorously promoting climate change as one of the main issue within their agenda. These organisations are also actively campaigning activities contributing to mitigation and adaption to climate change impacts, ranging from plastic bag diet program to conservation of forest and biodiversity[53]. Yet so far, NGOs have no specific concern on mitigation actions MRV. For role of academia and research institutions, it is still limited where they could be involved at project research level. Research and studies were done based on the interest or request of government and companies, or for students themselves (P10)

[53] http://pub.iges.or.jp/modules/envirolib/upload/710/attach/fc2_3088.pdf accesses on 20 June 2013 at 17.45.

5.4. Perspective of MRV for developing countries

5.4.1. The importance of MRV for Indonesia

For Indonesia, MRV is perceived as a mechanism and framework to quantify mitigation actions and to balance between commitments and qualitative actions. In general, MRV is important to improve the performance of national development strategy. MRV also strengthen the monitoring of financing of sectoral programs and strategies, which initially has already been covered in each institution's M&E system. Therefore, MRV is seen an entry point so that every action and plan is measured and real, including the efficiency and progress made. The transparency, accountability and reliability of Indonesia's actions are crucial to get international recognition and support for a stringent emission reduction target (P2).

At the international negotiation forum, governments have realized the importance of MRV. Yet developing countries have put forward so many actions and concessions on the table, while developed countries have yet enhancing their target and commitment. With their long-established and robust MRV system, developed countries were lagging behind their emission reduction target within the first Kyoto period. And currently, they seem to be reluctant to scale-up the commitments, targets and actions, along with providing support for developing countries. Therefore, Indonesia is waiting for more clarity and looking at the direction and development of the negotiation on NAMAs and MRV, before deciding which ones are in line with Indonesia's interest (P10).

5.4.2. National Interest of implementing MRV

In developing policies to tackle climate change, Indonesia identified three basic principles, that the response strategy cannot be separated from national development strategy, the principle of equity and justice must guide the process of anticipating and assessing impact, and net GHG emissions must be reduced without hampering the national development objectives. Although these principles affirmed Indonesia's priority to national development, it is within the current government's interest for Indonesia to be at the forefront in combating climate change within the international community. Indonesia has an aspiration to become exemplary for other developing countries in mitigation -and adaptation- toward climate change, which consequently includes MRV (P2, P14)).

Indonesia's national commitment of 26% emission reduction from BAU baseline has been the main driver of establishment of an MRV system. As a system to keep the work on track, MRV is very much needed to monitor progress and to be more efficient toward achieving the target (P10). As one of the first among developing countries to submit the emission reduction pledge, Indonesia would like to be on the forefront on MRV issue. However, this view is only adopted

by those who are working, involved and concern about climate mitigation and monitoring. Outside of climate change, there are other environmental issues, let alone developmental or other national issues. Therefore GoI cannot be too idealist and neglecting other national development priorities (P2, P10).

However, there is concern that Indonesia's progress in MRV is regarded as too advanced by other developing countries, especially for major developing countries. This will burden them, since it will be regarded that if Indonesia could achieve such advancement, why can't other, more advanced, developing countries follow suit? Indonesia should not make this counterproductive move, since no developing countries want binding decision that will negate the voluntary nature of their actions. Since even developed countries are reluctant toward a binding second Kyoto period, developing countries should wait for their commitments first (P2).

Indonesia is of the view that for supported actions, everything including whether target is actually met, actions, policies, finance and capacity building should be MRVed. But for unilateral, voluntary actions, there is no need to have a too stringent MRV. Regarding the design of MRV system for developing country, in line with NAMAs which is nationally appropriate, MRV should mainly be nationally-appropriate with country-driven, bottom-up approach. However, certain standardisation could be applied in a hybrid system, but how this application would be needs to be really clear (P10, P14).

5.4.3. Feasibility and Justification of MRV for developing countries

As is the case with China. the evaluation for the feasibility and justification of Indonesia's MRV implementation indicators is using a simplified scoring and interpretive analysis in processing data the Indonesian interviewees also share similar views and opinions, with differences exist in the background reasoning. Table 8 below shows the compiled analysis of the findings on the variables, criteria and indicators for MRV implementation in Indonesia:

Table 8. The compiled analysis of the findings on the variables, criteria and indicators for MRV in Indonesia

Feasibility					
International climate regime	Provisions for MRV		Exist	Not clear	No
		Guidelines for MRV		x	
		Framework/design of MRV			x
		Supports availability to implement MRV	x		
National circumstances	National governance		Good	Medium	Poor
		Climate governance		x	
		Environmental Informational Governance			x
		Involvement of non-state actors		x	
	National constraints		High	Medium	Low
		Economic constraint			x
		Political constraint			x
		Organizational/Institutional constraint	x		
		Cultural/Interpretational constraint	x		
		Other gaps and challenges		x	
Justification					
International climate regime	Principles of the Convention		Just	Medium	No
		Common but differentiated responsibility			x
		Voluntary mitigation actions for developing countries		x	
		Align with national development priority and country's respective capability	x		
National circumstances	National interest		Yes	Not clear	No
		Achieve national mitigation target	x		
		International acknowledgement and supports achieved	x		
		Domestic policy incentives	x		

MRV is perceived as an issue that is neither hampering nor expediting the climate negotiation process. Yet it is still an important issue and is complementary to more crucial issues like shared vision for a stringent target, long-time cooperation on mitigation actions and climate financing (P2). There are debates surrounding MRV issue, but as long as there is no pressure or compulsion to developing country Parties, it is not a major issue. Indonesia thought that there should be flexibility and appreciation given to what has been done and adopted by developing countries (P14).

Despite persisting gaps, challenges and barriers as explained, Indonesia is quite positive that it is feasible to implement MRV as required by the UNFCCC. From the resource persons' interview, it is estimated that it will take about 4 to 5 years (P2, P5, P10, P13) to have a first-trial, not fully-running MRV system, and up to 10 years (P13)to establish a robust and fully-running MRV. This amount of time is considering the difficulties faced in the land-based sector, whereas MRV for energy sector only is estimated to be achieved in 5-year time (P2).

The positivity is based on the current strong political will and high interest from the top level of the government to generate NAMAs within each sectors and to comply with the MRV requirement (P14). Secondly, there is already a mutual understanding amongst line ministries, related institutions, agencies and local government that MRV system is crucial for more efficient mitigation actions implementation in order to meet the national emission reduction target. This understanding led to acceptance by the institutions and despite challenges in coordination, all sectors are willingly mainstreaming and incorporating policies to enable MRV (P10). However, the MRV system is envisioned to fulfil domestic needs to meet national emission reduction target. Strengthening M&E into MER for RAN/RAD GRK is the current priority, while on parallel, MRV system is being developed based on improved MER. This is all the while waiting for more clarity for MRV agreements and decisions at the UNFCCC negotiation (P14).

Interestingly, realising the emission growth by developing countries where Indonesia plays a significant part, MRV is regarded as partially justified to be implemented[54]. The ambitious target that has been pledged by Indonesia will not mean much if it cannot be monitored, reported and verified appropriately (P14). MRV therefore is fundamental for any scheme to achieve emission reduction target, be it national or sectoral. However, MRV is justified for supported action only and the justifiability is conditional based on the availability of support in funding, capacity building and technology transfer, and on the stringency and deliverability of actions by developing countries. For example, in transfer of technology, it has to be ensured whether the technology is accessible, regardless the matter of property right, and so as it will not be just another technology market scheme. Therefore, the supports themselves should be closely measured and verified (P2).

[54] An elaboration of how to achieve this conclusion regarding Indonesia's view of justification is given in Chapter VI.

Chapter VI

Discussion, Conclusion and Recommendation

6.1. Discussion of the research

Climate change impacts are already being felt throughout the world. The latest International Energy Agency (IEA) report confirms that energy-related CO2 emission hit record high[55]. Unchecked global warming will exponentially increase human and economic toll from responding to a warmer planet. A recent report from the World Bank[56] outlines the devastating effects of a global temperature rise of a 4 degrees Celsius above pre-industrial levels: flooding of coastal cities, risks to food production, unprecedented heat waves, increased frequency of extreme weather and climate events that cause casualties and mounting economic and human costs. Thus we should move toward a low-carbon future, investing in low-carbon energy systems and preparing our infrastructure for the adverse impact of climate change. Delaying actions would increase the costs by having to retrofit energy sources and risking them become obsolete.

The main challenge faced by the international climate regime is to reduce GHG emissions to a level consistent with the 2 degrees target. This requires bold mitigation action by developed and developing countries. Based on a study by McKinsey, it is estimated that global GHG emissions will be of 70 gigatonnes CO2e per year in 2030, of which 38 gigatonnes CO2 could be abated cost-efficiently. About 60% of these GHG abatement potentials is located in developing countries. Given this projection, the world can only meet its goals for stabilization of GHG concentration in the atmosphere if developing countries reduce their emissions alongside stringent target by developed countries (Enkvist et al., 2007). Figure 26 below shows the abatement potentials of the BAU emissions:

[55] http://www.usatoday.com/story/news/world/2013/06/10/iea-energy-emissions-rose-to-record-high-in-2012/2407555/ accessed on 4 May 2013 at 15.22.

[56] http://climatechange.worldbank.org/sites/default/files/Turn_Down_the_heat_Why_a_4_degree_centrigrade_warmer_world_must_be_avoided.pdf accessed on 18 April 2013 at 23.09.

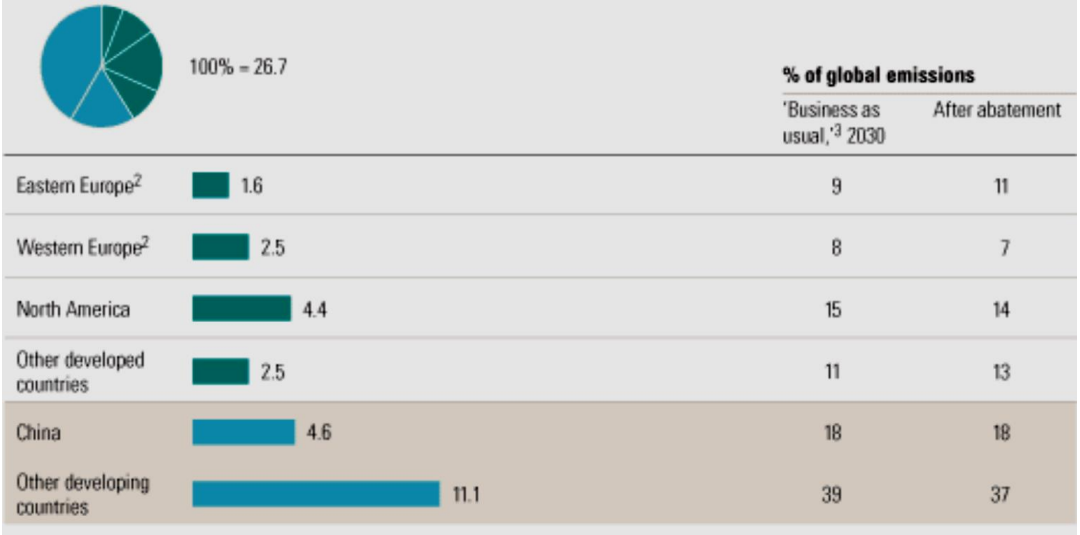

Figure 26. Abatement potential of GHG emissions (Enkvist, 2007)

Based on figure 26, it is clear that developing countries must take part in global mitigation target in order to achieve the 2 degrees target. Yet this proposition is conflicting with the principles of the UNFCCC that clearly stated that developing countries are not obligated to mitigate climate change due to the different historical responsibility and respective capability between developed and developing countries. However, countries like China, India, Brazil and Indonesia are not developing countries in the sense the Solomon Islands, Mali or Tuvalu. So taking into consideration that some developing countries have experienced significant growth that resulted in increasing emissions, developed countries want this emerging economies to share some responsibilities in mitigation and to quit hiding behind the label of 'developing country'.

Many developing countries have taken mitigation actions previously within the CDM scheme, which is a flexible, project–based mechanism with clear and stringent methodology and MRV. Since the CDM and other flexible mechanisms have not been sufficient in reaching the global target, NAMA is created. NAMA is then aimed to be the forum of developing countries' mitigation actions, particularly for the major developing countries, with BUR and ICA as the MRV mechanisms. NAMAs MRV for developing countries is to ensure that the NAMAs taken are "real", comply with UNFCCC requirements, and to channel existing support for a more advanced technology and rigorous effort (P9).

However, MRV for the NAMAs cannot be enforced for all developing countries due to the vast differences among countries in terms of circumstances, capacity and capability. The actions by developing countries should also maintain the voluntary nature and conditional to the availability of provisions in terms of clear guidelines, framework design, and supports from developed countries and international community at large. MRV should not become barrier and

caused too much effort The cost to set up an MRV system should not surpass the cost to take domestic mitigation actions. For supported NAMAs, the cost should only take small portions of the whole fund (P1).

The research are studying and comparing the MRV system in China and Indonesia with reasons that they are quite advanced in terms of basic national circumstances in economic and political situation, they play active role in the international climate negotiation forum and are vocal regarding MRV issue, and they have been either adopting or developing policies on MRV. The analysis below will try to gain a more thorough understanding of MRV implementation in both countries

6.1.1. Discussion on the findings based on research objective and questions

At the international level, the divergences on MRV issue lie where developed countries want MRV to assess contributions of developing countries to global mitigation with while developing countries do not want to be burdened by overly complex MRV requirements. Within developing countries themselves, the differences between LDCs/SIDS and advanced developing countries lead to different degrees of willingness to engage in MRV (P8). MRV issue then become a bargaining chip of the negotiation, which is still unclear of whether it is going to expedite, or hamper the negotiation process.

The lack of clarity of the guidelines, framework and provisions of the MRV for developing countries led to confusion in implementing MRV requirements at national level. Yet in most cases, sometimes developing country Parties are unaware of the availability of support, for instance, that there is already fund for BUR development for each country. Or even if this fund is known, the least developing countries do not have the capacity to meet the requirements to access this fund, which is developing a proposal (P3). Most developing countries are now taking the position of wait and see of the progress of the issue, all the while strengthening national capacity and existing monitoring system to be upgraded to fulfill international MRV requirements.

China and Indonesia have different geographic characteristics and topographic condition. But they have about the same level of vulnerability toward the impact of climate change and other climate-related environmental problems. The similarities also shared in terms of economic capacity, where the high growth of both countries have resulted China's and Indonesia's high emissions level, but on the other hand made them sufficient enough to self-finance their respective mitigation and adaptation actions. However, as developing countries, China and Indonesia still faced many developmental problems which need to be addressed first and

foremost. Thus the economic capacity to address climate change is related to the political will of the ruling government, on how high is climate change be placed in national priority and how to allocate or govern the financing to the climate actions.

The distinction of the political situation between China and Indonesia is also noticeable where China centralised system enables an easier coordination and command-and-control from central to local government than Indonesia's decentralised system. Reflecting this distinction, the institutional arrangement in both countries are different where China has less institutions or agencies that are involved in climate change in general and in MRV in particular, rather than Indonesia' institutional arrangements. The complicacy of Indonesia's institutional arrangements is also caused by the multi-sectoral approach of its mitigation strategy. Yet in spite of this complication, political will to establish MRV seems to be more progressive in Indonesia, along with its ambition to become the exemplary for other developing countries.

China and Indonesia are also among the first countries that ratified the climate change Convention, and have played active role in the negotiation process. Internally, both China and Indonesia have integrated climate change into the development plans and strategies. Several policies have been adopted and regulated through subsequent laws and legislations. Based on the national characteristic and natural circumstance, it is rational that China is focusing more to the energy sector in combating climate change, while Indonesia put high importance to the forestry and peat land since those sectors are the biggest emission source within each country. Therefore the policies and actions of both countries are quite distinctive.

Specifically on MRV issue, there are more on going processes and developments in Indonesia than in China. Though there are still a lot of problems need to be furthered and resolved, Indonesia has a more thorough and comprehensive planning and strategies toward MRV establishment. Indonesia also has more preparation toward the additional requirement like BUR and ICA process, which it perceived as an extension of the current reporting mechanism. On the other hand, China has yet taken a known actions toward these requirements, all the while insisting that international verification process would be unacceptable and disregarding to national sovereignty.

These differences are notwithstanding the climate capacity -or lack thereof- in both China and Indonesia. Although the government of China and Indonesia have adopted climate policies and actions and integrated those policies and actions into national development strategies, both countries are in need of more awareness raising, capacity building and development and transfer of more sophisticated technology to mitigate climate change, more so to the MRV of the

mitigations actions. Regarding non-state actors, there is a higher pressure from the business sector in Indonesia who has a significant demand and interest toward establishment of MRV system than in China.

Constraints on MRV implementation exist in term of institutional and organisational matter for both China and Indonesia. There are complicated institutional arrangements with gaps and overlaps in task and functions, topped by lack of coordination and non-cooperative manners among institutions. There are also existing cultural problems namely the behaviour of Chinese and Indonesian that is not appreciative to the importance of data, with lack of reliability and accountability in handling data and recognising the data source. Other hindrances exist on technical matters that are related to capacity and weak data system. The lack of capacity and weak environmental informational governance could hold back both countries' effort in putting a MRV system in place.

However, both China and Indonesia are moving toward establishing MRV system, since it is in line with their national interest. The MRV system is expected to trigger a change within their existing monitoring system, which could improve efficiency and effectiveness in achieving national target. Other incentives for China and Indonesia to implement MRV are, among others, to raise awareness and promote transparency and accountability of their data and information system, to advocate bigger role from non-state actors with particular focus on industry sectors, and to reduce vulnerability by meeting emission reduction or energy intensity target.

Table 9 summarises the findings of the research, with the methods in reaching this summary is explained in the section discussion on research methodology below:

Table 9. Summary and comparison of findings on China and Indonesia. C stands for China while I for Indonesia

Feasibility					
International climate regime	Provisions for MRV		Exist	Not clear	No
		Guidelines for MRV		**C/I**	
		Framework/design of MRV			**C/I**
		Supports availability to implement MRV	**I**	**C**	
National circumstances	National governance		Good	Medium	Poor
		Climate governance		**C/I**	
		Environmental Informational Governance			**C/I**
		Involvement of non-state actors		**I**	**C**
	National constraints		High	Medium	Low
		Economic constraint			**C/I**
		Political constraint			**C/I**
		Organizational/Institutional constraint	**C/I**		
		Cultural/Interpretational constraint	**I**	**C**	
		Other gaps and challenges		**C/I**	
Justification					

International climate regime	Principles of the Convention		Just	Medium	Not
		Common but differentiated responsibility			**C/I**
		Voluntary mitigation actions for developing countries		**I**	**C**
		Align with national development priority and country's respective capability	**I**	**C**	
National circumstances	National interest		Yes	Not clear	No
		Achieve national mitigation target	**I**	**C**	
		International acknowledgement and supports achieved	**C/I**		
		Domestic policy incentives	**C/I**		

6.1.2. Discussion on theoretical framework

The theoretical framework starts with the theory of governance in general and climate governance in particular. These theories have given an initial overview of what would be the scope of analysis, and some kind of a guidance on what and what not to be researched on. Since the research is analysing mitigation actions MRV in China and Indonesia as required by the UNFCCC, the climate governance is divided into national and transnational climate governance.

The definition of climate governance at national level enables the identification of variables of analysis for mitigation actions MRV, which are the national policies and strategies adopted to address climate change, the capacity to implement the policies, and the actors involved in the governance process either from governmental or non-governmental sectors. While the transnational climate governance theory gave an understanding of the complexity of UNFCCC as the operating entity of the international climate governance.

The theory of Prolonged International Negotiation Process that specifically focus on the climate negotiation gave more comprehension of the factors that shape state's preferences/interests. This theory also help in identifying other variables of analysis or complementing the variable that have been identified earlier. For example, the theory stresses the role of non-state actors and level of their engagement on the negotiation. This is regarded as complementary of the variable of actors involvement that has been captured in the climate governance theory. While examples of newly-identified variables include the preferences of the chief of government (which in this research is regarded as part of political will in the section of basic national circumstances and integration of climate strategy into national development plans), and vulnerability that is also country's basic national circumstances. Besides explaining the factors the affecting state's behaviour in the climate negotiation, this theory provided the basis to evaluate justification of MRV, which are the national interests, preferences and expectations in MRV implementation

The theory of environmental informational governance is taken for MRV is strongly related to data and information system, which for this research, only applied at national level. This theory provided the basis to evaluate the feasibility of MRV implementation, which are the state of data and information system itself and the national constraints that determined whether a country belongs to the category of rich- or poor information environment. The constraint are given more emphasis in this research since based on the preliminary data gathering, the results point to the gaps and challenges in MRV implementation. The four constraints in this theory help to classified the national constraints faced in reality.

Lastly, the theories of feasibility and justification are utilized to clarify that this research is indeed neither a feasibility study nor a justification analysis. I found that although there are many feasibility studies that has been done, the study of general feasibility like this research is not found. While on justification analysis, the existing studies are either an empirical justification that applies to knowledge or knowledge-related issues, or justification analysis like this research but with to religious/faith/belief system as unit of analysis. Thus, there is a possibility that this research is the first of its kind, and therefore it is susceptible toward flaws and shortfalls.

6.1.3. Discussion on research methodology

This research is applying a comparative study design since it aimed at understanding and enhancing knowledge of the subject of research which is climate mitigation actions MRV for developing countries. This research is taking case studies of China and Indonesia, and conducting analysis with a comparative approach. Although the research is making comparison on China and Indonesia, but to compare both countries' policies and actions toward MRV implementation, or both countries perspective in regards with feasibility and justification of MRV for developing countries, was not the goal. The objective of this research is to analyse the feasibility and justification of MRV for developing countries, from the circumstances and perspectives of China and Indonesia. The result is not meant to be a generalisation for all developing countries. Instead, it is hoped that by taking examples of China and Indonesia as major developing country, other countries within the international climate cooperation could get insight and lesson learned on MRV implementation in developing countries.

Because the units of analysis in this research are countries, the research applied a design with embedded units of analysis that consists of various components, variables and criteria at multiple levels. The various components and variables were identified from the preliminary literature review, experts' interview, and documentation analysis. These components and

variables were then developed into a conceptual framework to analyse the feasibility of MRV implementation, and to formulate questionnaire for resource persons' interviews.

After preliminary data collection, interviews were conducted. The method of getting the participants of interviews was done by a combination of convenience and snowball sampling methods. Since MRV is a segmented issue, there is only an exclusive list of resource persons who are familiar with and involved in this issue. From the limited list, only a handful of these persons are available and willing to be interviewed. The resource persons in this research are divided into interviewees at international and national level. Interviews at international level were conducted with of one UNFCCC negotiator/personnel, and three international consultants. While at national level, interviewees comprised of government officials and negotiators, and national consultants and experts.

Since the interviews were conducted within a considerable time frame, there are alteration in the list of questions from the preliminary interviews the more recent interviews. The questionnaires are also differentiated between for international and national level interviewees. The questionnaire consists of fifteen to twenty-five open-ended questions covering the components, variables and criteria of analysis, and attached as appendices in this thesis along with the list of interviewees. The interviews are conducted through various ways including direct face-to-face interview, Skype conference, phone conference and written correspondent via email.

The excusive list of interviewees provides limitations to the result, since the analysis then based only on perspectives of a small group of resource persons. However, background check done have ensured the significance and relevance of these resource persons in MRV issue. Another limitation was presented on technical problem which include language barriers in communication, limitations resulted from the different ways of interviews (for example, Skype and phone interviews were highly inconvenient compared to direct or written ones), and also where the interviewees had not read the background information given alongside the list of questions. That has caused some of the interviewees were not providing answers to questions that are related to theoretical framework mentioned in the background document, or only giving a general answers that are not accordingly to the context. Moreover, some questions also left unanswered due to some interviewees are not following the questioned matter or subject.

The results of the interviews were then being analysed with interpretive methods. The results of the interviews with international experts/resource persons are used as source of information of the background and condition of the international climate negotiation process on MRV. Even

though the interviews also captured the general perceptions of MRV implementation for developing countries. the international experts' view were not utilised to value the feasibility and justification of MRV for developing countries. The value of feasibility and justification were taken from the perspective of Chinese and Indonesian interviewees for their respective country's situation.

Since I developed a conceptual framework for the research with its own criteria and indicators, I faced difficulties in giving value to the results, because I could not find appropriate valuing methodology applicable in this research. The interview results are vary with far reaching degree of answers, due to the open-ended questions, thus difficult to be quantified as in existing qualitative analysis scoring method Consequently, I formulated a simplified scoring system as follow:

Out of the five interviewees from each China and Indonesia:

- 4-5 out of five answers constitutes as high/good/yes
- 2-3 out of five answers constitutes as medium/not clear
- 0-1 out of five answers constitutes as low/poor/no

For example, on the valuing of national constraints in MRV implementation in Indonesia. Based on the interviews results, all of Indonesian interviewees is of the view that there are high institutional and organisational constraints; four out of five said that there are cultural problems; two out of five mentioned other gaps like technical aspects in data system and lack of capacity; while none of them is of the view that there are barriers in term of economic and politic for MRV implementation. Thus, the score for organisational and cultural constraints is high, for other aspects is medium, while for economic and political constraints is low.

For valuing feasibility, the perspectives of the interviewees are being elaborated or matched with data and findings from secondary literature. However, this elaboration method applied only for the value of feasibility while for justification, it is based solely on the interviewees' perceptions. The example of valuing for the perspective of justification of Chinese interviewees is given in table 10 below:

Table 10. Example of question of the interview

Question:"Is the implementation of NAMAs MRV for developing countries justified?"			
China	Answers	Indonesia	Answers
P4	For NAMas MRV right now is not clear, it's only a topic to be discussed, let alone the implementation. Again, there should be support for NAMAs, moreover to its MRV. If that's not the case, like proposed by developed countries, then it is not justified.	P2	Justified as long as developed countries fulfill their commitments, especially in terms of providing support.
P6	--	P5	Yes, but not as an obligation
P7	Without the support of financial and technology, it is not justified.	P10	Based on the Convention, it is the obligation of every country to reduce emission. There's a conflict where developed countries want that to be applied literally, while developing countries take into account the historical responsibility. So it's actually not fair to expect that developing countries have MRV system with the same standard as developed countries. But nationally, it is good to trigger a robust existing system.
P11	I don't think it's very fair, because developing countries has no obligation to mitigate. It's only contribution and developed countries should do more, but they do not. We already have NAMAs, but they ask to MRV the NAMAS, so it's not fair.	P13	For supported actions, yes, but for own actions, no.
P12	About international verifier, it is not necessary to have that kind of scrutiny. For what (is it)? For national inventory? Company verification? It is not feasible for checking data. But if we're talking about checking methodology, it is still make sense.	P14	For Indonesia as major economy developing countries, yes.

The answer to this questions is being cross-checked with other questions within the scope of justification in the table of variable, criteria and indicators. These other questions are in regards with whether MRV helps countries in achieving national emission reduction target, international acknowledgement and support and domestic policy incentives[57]. Based on the answers, the conclusion reached was that from Chinese perspective, MRV implementation is

[57] For the list of questions, see appendix.

perceived as not justified while from Indonesian's perspective it is somewhat justified. More on the conclusions are given in the section below.

6.2. Conclusion and Recommendation

6.2.1. Conclusion

Based on the lack of clarity in the framework and design of MRV for developing countries, it is more inconvenient rather than infeasible for developing countries to implement MRV. The lack of clear guidelines, which are still under development based on the countries' submissions, is also not helping for developing countries to implement MRV requirements. But the main concern for developing countries is the availability of supports in terms of financing, capacity building, technology transfer and support for other technical matters.

For developing countries, there are challenges for example in setting up and updateable emission inventory system and defining credible baseline scenarios for emission reduction target (I8). And is MRV is perceived as a holistic auditing process for climate mitigation actions, then to set up a robust MRV system at national level is indeed costly and takes a lot of effort. The still weak data and information system, the high constraints in institutional and organisational matter, could hamper the implementation of MRV. And although China and Indonesia as major developing countries do not have significant economic barriers, the political situation are still fragile and the changes in the chief of the governments could disrupt a setting up process of not only MRV system, but the whole mainstreaming process of climate issue in national development plans.

Nonetheless, China and Indonesia have taken some sound measures toward establishing national MRV system, which is intended more to help them achieve their mitigation target rather than to comply with UNFCCC requirement. MRV is perceived as a necessary tool to complement national mitigation actions, to achieve emission reduction target as pledged that in a long run is expected to reduce their vulnerability toward global warming and climate change. MRV is also expected to expedite the way toward low emission development strategy, to achieve domestic policy incentives of strengthening the current system and to address other environmental problems, and also to get acknowledgment and support by developed countries and international community.

Yet there is distinction between China and Indonesia in the importance and interest of MRV. China is more inward looking, putting high priority to maintain and enhance its economic growth. That is also the reason why China is focusing on energy intensity target since the efficiency in energy and reducing dependency to fossil fuel by switching to renewables are in

line with the development strategy and growth target. Indonesia on the other hand is more outward looking by trying to comply to as many requirements, which is in line with its ambition to be at the forefront in climate change issue.

The various components and variables analysed above are then affecting the difference in China's and Indonesia's perspective on the feasibility and justification of MRV for developing countries. Where both countries perceived that it is feasible to establish MRV system for developing countries, but China holds a stronger opinion in terms of justification. China still perceived that it is not justified for developing countries to being required to implement MRV. MRV should be a voluntary mechanism, and only complementary to national mitigation actions. While for Indonesia, there is not an unanimous perceptions on justification, but the propensity is that emerging economy developing countries are justified to take some actions to mitigate climate change and to be have those actions monitored, measured and verified, though once again, highlighting the conditional of availability of supports.

6.2.2. Recommendation

This research is hoped to be able to give insight to anyone who is concern of the issue of climate mitigation actions MRV for developing countries. However, to be able to get a more thorough overview of the situation in and perspective of developing countries MRV, a further research is needed that incorporated a wider scope. The research should include examples of other major developing countries like South Africa, Brazil and India; medium developing countries like Mexico, Ghana or Thailand; and countries representing the group of LDCs/SIDS like Ethiopia , Maldives or Tuvalu. The further research should also incorporate a wider scope of interviewees, with balanced participants from non-governmental actors. Regarding the research conceptual framework , I would utilises all the components and variables as the basis for interviews and scope of analysis. However, there are possibilities for the variables of analysis to be adjusted to incorporate more aspects, or in reverse, to be focused only to the more relevant variables like for example, national interest and climate governance, depending on the situation of the countries.

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Appendices

I. Background Information

Thank you for your participation in my thesis research at Wageningen University and Research Center (WUR) intern requirement with Environmental Policy (ENP) department. This thesis is one of the requirements for my master degree on Climate Studies. The thesis itself is titled "MRV on Climate Mitigation Action for Developing Country Parties: Feasibility and Justification. Perspective of China and Indonesia". Below is a little background to my thesis research.

Background

The United Nations Conference on Climate Change (UNFCCC) was established as an outcome of Earth Summit in Rio de Janeiro in 1992, and it entered into force in 1994. The Kyoto Protocol, an international treaty linked to the Convention, commits industrialized countries to reduce their greenhouse gases emissions through measures at national scale. The target of emission reduction is amounted to an average of five per cent against 1990 levels over the five-year period of 2008-2012 (Depledge & Lamb, 2005).

At UNFCCC COP 13 meeting, Bali Action Plan (Decision 1/CP. 13, www.unfccc.int) introduced the notion of linking GHG mitigation action in developing countries with support for such action. It also coined the term "measurable, reportable and verifiable (MRV)" which is the manner of information system of Parties' national mitigation actions. However, it does not specify the relationship or link that could be made between nationally appropriate mitigation actions (NAMAs) in developing countries and mitigation support. The term itself leads to many questions and interpretations including what M, R and V are, what they should apply to, who should undertake them, and how. It also remains unclear whether the MRV requirements apply to the link between NAMAs in developing countries and mitigation support, or to one or both of the separate elements (Ellis et al., 2011).

Through series of meetings, negotiations and discussion on the topic of MRV at the international or regional level, there seem to be a loosely mutual agreement that MRV refers to a set of processes and procedures through which factual information is provided, assessed and checked to determine whether, when and how Parties effectively meet their respective obligations in reducing emissions. Thus, MRV is crucial since it entails provisions of transparency and accountability which are essential to assess and commensurate countries' performance and compliance to the international climate change cooperation (Wemaere, 2009).

Following the Copenhagen Accord, Cancun Agreement (Decision 1/CP. 16, www.unfccc.int) established new and additional responsibilities for developing countries or Non-Annex 1 Parties to enhance the measurement, reporting, and verification (MRV) of mitigation actions and GHG inventory. These requirements were furthered at COP17 in Durban, South Africa, where the Parties to the UNFCCC decided that non-Annex 1 Parties, in accordance with their respective capabilities and level of support provided, should submit a biennial update report (BUR) every two years, with the first BUR's deadline is on December 2014.

The BUR should contain information on the national circumstances and institutional arrangements relevant to the preparation of National Communication; national GHG inventory; mitigation actions and their effects; constraints and gaps, and related financial, technical and capacity needs, as well as the level of support received. Information submitted in the BUR has to

be MRVed, while mitigation actions taken with international support will be subject to international consultation and analysis (Decision 2/CP. 17, www.unfccc.int).

Although developing countries in general agreed to MRV obligations, there are different levels of acceptance and perceptions toward them. The lack of clarity on the technicalities of MRV for developing countries does not help the case, and so there are uncertainties on how to move forward with the implementation of MRV for developing countries.

The main objective of this research is to analyze the feasibility and justification of climate mitigation actions' MRV for developing county Parties under the UNFCCC. In general, to study about feasibility means to examine whether it is possible (or reasonable or profitable) to do something. The study of feasibility could also mean an analysis of possible solutions to a problem and a recommendation on the best alternative. It can decide whether a process can be carried out by a new system or structure more efficiently than the existing one (Kitnaes & Zingstra, 2012). Meanwhile, justification explains why we should or should not do something. To reach this objective, analysis will be conducted at international and national level. Ultimately, the findings of this research are expected to give a clear overview, conclusions and recommendations in regards with MRV issue in climate change negotiation.

This research will take the case study of China and Indonesia as representatives of developing country Parties in the international negotiation. China and Indonesia were selected as they are major economic developing countries, and are also the large CO2 emitting countries according to the Union of Concerned Scientist as shown in the figure 2 below:

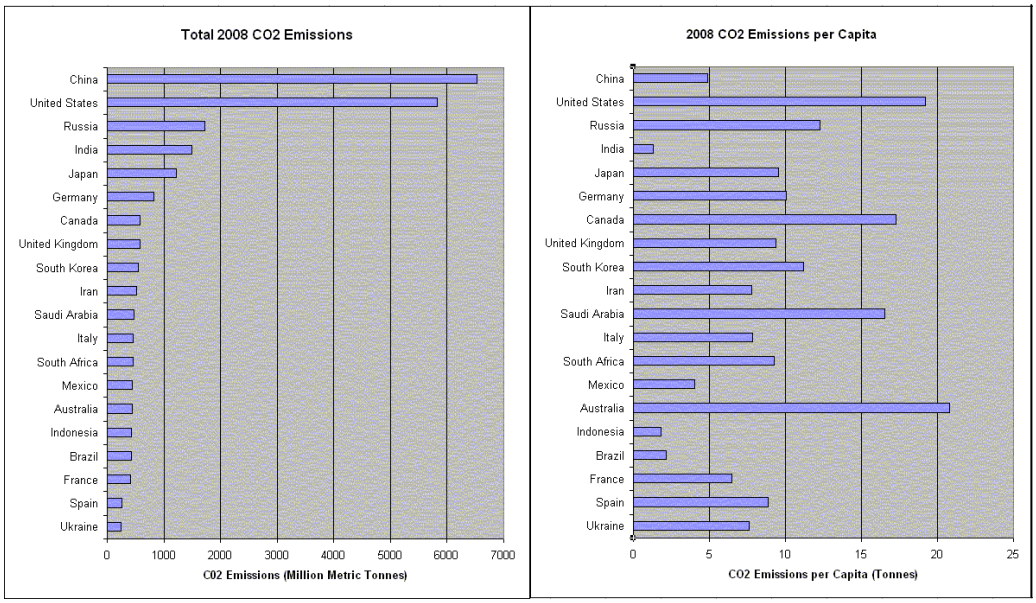

Fig. 2 The 20 countries that top total CO2 emissions and CO2 emissions per capita (Source: www.ucsusa.org)

China and Indonesia are among the first countries which embrace the Copenhagen Accord. China stated its plan to limit its greenhouse gas output by reducing its carbon intensity in 2020 to up to 45% from 2005 baseline (www.news.bbc.co.uk). However, China has predominantly opposed to NAMAs MRV for developing countries, particularly toward international verification (Hsu&Basset, 2009). Meanwhile, Indonesia in G20 meeting in 2009 has stated its pledge to reduce its emission in 2020 up to 26% by unilateral actions, and up to 41% with international support. In Copenhagen meeting later that year, Indonesian President Yudhoyono reiterated that pledge and further stated that Indonesia is accepting MRV obligations and is open to

international consultation and analysis. He repeated the support on MRV in his statement in Durban meeting in 2011 (www.unfccc.int).

This research is using theoretical concept of Informational Governance by Arthur Mol (2008) in his book "Environmental Reform in the Information Age: The Contours of Informational Governance". Mol stated that knowledge and information on the environment are crucial for environmental policy making, governance and reform measures and strategies. However, it is important to make a distinction between knowledge, information and data whereas abundance data may contain only little information, let alone knowledge. Environmental data often refers to numbers and figures on environmental conditions and environmental information that points out meaningful flows of signs for a targeted audience. Information then refers to raw data that are processes, selected and translated to address meaningfully an audience, whose in turn decide whether the information could be passed as knowledge or not.

Mol further explained about the shift from informational society to informational age, which bring about and brought about by the changes and innovations in the global modern world. This shift created the clustering of information-rich environments and information-poor environments. Most of industrialized countries, notably the OECD countries, belong to the first cluster. However, one can notice that there are particularities in the informational governance between United States, The Netherlands and Japan due to the various cultural, economic and political system.

While the second cluster consists primarily of developing countries, not all industrializing states belong to this group. Mol provided four ideal-typical forms on information-poor environments, which in reality, these ideal types mix in nature. First, information-poor environments are driven by economic constraints and secondly by political constraints. Third, information-poor environments can relate to poor organizational-institutional conditions and environmental capacities and fourthly, it can relate to problems in the cultural or interpretations frames of information, or to conflicting cultural or interpretation frames of information.

This theory will be used to assess the condition and circumstances of China and Indonesia, on their state of environmental informational governance in terms of data collecting, existing reporting and monitoring system, and the producing of national communication and GHG inventory, as the existing reporting mechanism so far. It will then be analyzed, how is the relation of each country's informational governance with the policy-making in implementation of climate mitigation MRV obligation.

II. Questions for International Interviewees

1. What is the current update on the issue of climate mitigation actions' MRV in international negotiation forum?
2. What are the debates and trade-offs in regards with negotiations of MRV for developing countries between Annex I and Non-annex I countries? What are the debates within the Non-annex I itself, if any?
3. What is the importance of the issue of MRV for developing countries within the international negotiation forum?
4. What is the background of BUR obligation as enhanced reporting mechanism? What lesson that could be learned from the national communication as the existing reporting mechanism?
5. What should be MRVed in BUR/NC: mitigation actions, policy adopted toward NAMAs, or the actual emission reductions?
6. In your estimation/prediction, how long do you think it will take to establish MRV system/to complete the implementation of MRV for developing countries?
7. What are opportunities and challenges in implementing MRV (enhanced) requirements for developing countries?
8. Based on the theoretical framework above and on your experiences or observations, what would be the biggest constraints faced by developing countries in establishing a reliable MRV system: economic, political, organizational/institutional or cultural constraint?
9. What should be the design of climate mitigation actions' MRV for developing countries: standardized, top-down mechanism; or non-standardized, country driven, bottom-up design?
10. With limited resources that developing countries have (financial human capacity, technology), to which do you think it is more important for these resources to be allocated: mitigation (and adaptation) actions or MRV implementation/establishment? Or both could/should be aligned?
11. Will MRV make mitigation actions more efficient in meeting country's national emission reduction target?
12. Do you think that cost to develop MRV (capacity building, tech transfer, installment of system, institutional arrangement, etc.) commensurate with the result(s) expected?
13. Do you think the implementation of MRV for developing countries is a priority?
14. Do you think the implementation of MRV for developing countries is feasible?
15. Do you think the implementation of MRV for developing countries is justified?

III. Questions for National Interviewees

On International Negotiation Process

1. What is the current update on the issue of climate mitigation (NAMAs) MRV in international negotiation forum?
2. What are the contentious issues or debates and trade-offs in regards with negotiations of MRV for developing countries between Annex I and Non-annex I countries? What are the debates within the Non-annex I (Group 77 + China) itself, if any?
3. What provisions (guidelines, framework, support in terms of financial, technology transfer and capacity building) already exist for developing countries MRV implementation?
4. What is to be expected in the MRV negotiation in future round of negotiation?
5. Do you think that MRV issue hinder/hamper/hold back negotiation process or in reverse enable/expedite/accelerate it?

MRV requirements for developing countries

6. What is Indonesia's position in terms of NAMAs MRV requirements for developing countries in the UNFCCC negotiation?
7. What policies have been adopted by Chinese/Indonesian government to implement these MRV requirements?
8. How do you perceived the new Biennial Update report (BUR) obligation? Will Indonesia be able to meet its deadline of 2014?
9. In preparing the Biennial Update report, what lessons that could be learned from the national communication (NC) as the existing reporting mechanism (in terms of report producing/development, resources and time needed, supports and guidelines provided through UNFCCC's mechanism, etc.)?
10. What should be MRVed in the coming BUR and next NC: mitigation actions, policy adopted toward NAMAs, or the actual emission reductions?
11. In your opinion, what should be the design of climate mitigation MRV for developing countries: standardized, top-down mechanism; or non-standardized, country-driven and bottom-up design?

National Circumstances

12. What/ how is the existing monitoring and reporting mechanism in China/Indonesia?
13. Looking at theoretical framework given in the background document above, is there any constraints in China/Indonesia's environmental informational governance (based on the four criteria: economic, political, organizational-institutional, and cultural)?
14. Still based on the theoretical framework, I would like to apply the theory of environmental informational governance in the production process of National Communication and/or State of Environment:
    a. How is the state of data collecting and processing in preparing these two reports (NC and SoE)?
    b. How significant is the use of the information within these reports for environmental policy making?

c. How is the state of environmental informational flow and access to general public in Indonesia?

15. How is the state of Indonesia's capacity in terms of knowledge and expertise, financial resources and technology capacity that are needed in monitoring and reporting mechanism?

On feasibility and justification of MRV implementation

16. Based on the national circumstances discussed above, is NAMAs MRV implementation feasible for China/ Indonesia?
17. What is the importance of establishing MRV system for China/Indonesia?
18. What are the expectations of Indonesian government by establishing MRV system?
19. What are the factors that shape/determine China/Indonesia's MRV policy?
20. In your estimation/prediction, how long do you think it will take to establish a MRV system in China/Indonesia?
21. What are the gaps, opportunities and challenges in implementing MRV obligations for China/Indonesia?
22. What is the role of non-state actors (business, NGOs, media, academia/research institutions) in the issue of MRV and its implementation in China/Indonesia?
23. In the face of limited resources (financial, human capacity, technology), is implementation of NAMAs MRV for developing countries is a priority at this stage?
24. Will MRV implementation make mitigation actions more efficient in meeting country's emission reduction target?
25. Based on the principles of voluntary (mitigation) actions, common but differentiated responsibility, respective capabilities and historical responsibility, is the implementation of NAMAs MRV for developing countries justified?

IV. List of Interviewees

Number	Name/Nationality	Occupation	Date	Method
P1	Stefan Bakker (Dutch)	Team leader Transport & climate change in ASEAN region – GIZ South East Asia	15 Feb 2013	Direct Interview
P2	Rizaldi Boer (Indonesian)	Environmental Consultant/Professor – CCROM/Bogor Agriculture Institute	26 Jun 2013	Direct Interview
P3	William Bonsu (Ghanaian)	Negotiator - UNFCCC	16 Jan 2013	Phone Conference
P4	Wang Can (Chinese)	Professor – Tsinghua University	22 May 2013	Direct Interview
P5	Retno Gumilang Dewi (Indonesia)	Environmental Consultant/Professor – Bandung Institute of Technology	27 Jun 2013	Direct Interview
P6	Wang Ke (Chinese)	Professor – Renmin University	29 Jan 2013	Skype Conference
P7	Elisa Lee (Chinese)	Environmental Consultant – International Technology Transfer Center/Coway Company	22 May 2013	Direct Interview
P8	Axel Michaelowa (German)	Environmental Consultant/Economist – Perspectives GmBH, Zurich	05 Jul 2013	Written Interview
P9	Philipp Munzinger (German)	Adviser Work Area I – GIZ PAKLIM	04 Jul 2013	Direct Interview
P10	Emma Rachmawaty (Indonesian)	Government Official – Ministry of Environment Indonesia	10 May 2013	Direct Interview
P11	Fu Sha (Chinese)	International Cooperation Department – National Center for Climate Change Strategy and International Cooperation (NCSC)	24 May 2013	Direct Interview
P12	Ranping Song (Chinese)	Researcher –WRI China	30 Jan 2013	Skype Conference
P13	Anandita Susanto (Indonesian)	Adviser Work Area III – GIZ PAKLIM	05 Jun 2013	Direct Interview
P14	Syamsidar Thamrin	Government Official – National Development Agency Indonesia	02 May 2013	Direct Interview