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Promoting Smallholders Carbon Projects in Indonesia

Wahyu Yun Santosa¹

As archipelagic country comprising about 17,000 islands and spreading over a total area of 191 million hectares, the prospect of carbon projects in Indonesia are massive. Aside present carbon project activities, the chances to initiate more small scale carbon project are abundant. However, most of the attentions are given for large scale carbon projects as carbon reduction itself still considered as an exclusive interest only. Several lessons can be learn by Indonesian from other developing countries on the implementation of smallholders carbon project. This article aims to briefly describe this issue and purportedly explore the chance of promoting smallholders carbon projects in Indonesia.

Keywords : *smallholders, carbon project, climate change*

I. Introduction

A. Climate Change and the Adaptation Mechanisms

Climate change refers to global warming as a result of an increase in the atmospheric concentration of greenhouse gas (GHG). The greenhouse effect is a natural and necessary phenomenon – without it the earth would be as cold as the moon, and uninhabitable. The greenhouse effect is caused by the accumulation of so-called greenhouse gases – water vapour, carbon dioxide, methane, nitrous oxide, and ozone – in the atmosphere. GHG allow short-wave radiation from the sun to pass through them but trap long-wave infrared radiation emitted by the earth, thereby “warming” the earth. Increasing concentration of GHG causes an enhanced greenhouse effect, and, consequently, climate change.

Climate change is a global phenomenon triggered by people’s activities especially those related to the use of fuel and land. Climate change and global warming became the most-discussed issue since it was brought to international and global political agenda in the end of 1980s. The rising concerns on global warming issue are triggered by the rise on global greenhouse gas emissions with an increase of 70 % between 1970 and 2004 (24 % between 1990 and 2004) and the potential consequences of it.²

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² IPCC, *Fourth Assessment Report: Climate Change 2007*. available online at http://www.wmo.ch/pages/partners/ipcc/index_en.html

The potential consequences of global warming include the rise in sea level, changes in weather pattern, impacts on human health (flood, drought and problem on water management system), and decline in overall biodiversity and implications for agriculture and food security.³

Obviously, adaptation will play a key role in determining the economic and social costs of climate change.⁴ The adaptation scheme brought by the UNFCCC (United Nations Framework Convention on Climate Change) regime, intentionally made a brand new level of negotiating the climate change problem. The inclusion of "flexibility" mechanisms in the Kyoto Protocol as the implementing rules of UNFCCC provides another advancement of the regime. Three flexibility mechanisms have been included in the Protocol. Emission Trading (ET) is only possible between Annex B countries and does not involve any projects. It consists just of a transfer of a part of the emissions budget (Assigned Amount Units – AAUs) of one country to another. Joint Implementation (JI) refers to the investment of an Annex B country for a specific project in another Annex B country that leads to reduction of emissions. The emission reductions achieved by the project are credited to the investing country. Finally there is the Clean Development Mechanism (CDM), the only Kyoto mechanism requiring developing countries (non Annex B countries) to participate.

The operating rules of CDM have evolved and developed in many stages. Eventually, the 7th CoP (COP-7) held in Marrakech delivered Marrakech Accord that reached the final agreement on the rules and regulations for the CDM. With the guidance established by the Marrakech Accord, the CDM was starting to be a cost effective mean of promoting sustainable development in developing countries. Indeed, the effective implementation of CDM can also achieve global climate change mitigation through market-based instruments.

The implementation of the CDM in developing countries should be supported with firm framework, both institutional and legal framework. However, in Indonesia, CDM still "owned" by big-scale industries and government. The issues of adaptation on climate change are not yet a common need and interest. The smallholders farmer for example, have not realize and understand the concept and recent progress in the current climate change issues. Accordingly, the urge to initiate more active participation

³ Figueres, Christiana (ed.). 2002, *Establishing National Authorities for the CDM: a Guide for Developing Countries*, Canada: IISD – International Institute for Sustainable Development.

⁴ Smithers, J., Smit, B., 1997. Human Adaptation to Climatic Variability and Change. *Global Environmental Change* 7 (2), 129–146.

from small level stakeholders in climate change adaptation is still far from its path.

B. The CDM and the Developing Countries' Contribution for Climate Change

The Clean Development Mechanism seeks to reduce the costs of industrialized states for reducing greenhouse gas emissions while supporting abatement efforts in developing countries.⁵ If the CDM is designed appropriately, it could prove to be a win-win mechanism. Firstly, the CDM could provide an opportunity for developing countries to get more access to advanced energy efficiency and pollution control technologies and additional funding and thus, could accelerate their future development along more sustainable path. Secondly, the CDM could help Annex I countries to meet their Kyoto commitments at a lower overall cost than would otherwise have been the case if they have to do it on their own. Thirdly, the mechanism enhances international cooperation in combating global climate change and thus is beneficial to the global environment as well. Fourthly, the mechanism encourages and permits the active participation of private and public sectors.⁶

The concept of the CDM originated from a proposal made by Brazil known as "the Clean Development Fund (CDF)" in mid-1997. It provided a compliance mechanism under which Annex I countries defaulting on binding emission targets would contribute to a fund to facilitate the transfer of technology to developing countries. In general, industrialized countries, the United States in particular, opposed such concept. Eventually, at COP-3 discussions, a few Annex I countries introduced the concept of CDM which was then endorsed as one of the flexible mechanisms under Article 12 of the Kyoto Protocol. This concept aims to provide cost-effective emission reductions for Annex I countries, in the same time contributes to sustainable development in non-Annex I countries (developing countries) by enabling the transfer of clean technology and green investments.

From February 2005, the CDM market has been growing rapidly with the coming into force of the Kyoto Protocol, the approval of the decision on unilateral CDM and the launch of the EU-ETS (European Union-Emission Trading Schemes) linked with CDM/JI.⁷ If the CDM is effectively

⁵ Mitchell, Ronald B. and Parson, Edward A. 2001, *Implementing the Climate Change Regime's Clean Development Mechanism*. Sage Publication: the Journal of Environment and Development, Vol.10, No. 2, June 2001. p. 125 – 146.

⁶ *Supra*, Note 2

⁷ *Supra*, note 2.

implemented, it has the potential to develop into a strong tool to address climate change as it is the only mechanism of cooperation between developed and developing countries under the Kyoto Protocol.

A developing country wishing to set the CDM as their strategy to obtain the investment on carbon market may need to take these circumstances into account:⁸

- a. Whether it could offer an attractive supply of cheap CDM projects;
- b. How the synergy between GHG reduction and national sustainable development can be achieved; and
- c. How is the capacity building of the national authority to sustain the CDM strategy.

The characters mentioned above show the importance of information, best-practice adaptation, appropriate capacity and institutions for the development of CDM projects, especially in developing countries. From the standpoint of developing countries, the success of the CDM rests on the contribution it may make to national sustainable development objectives.

The Marrakech Accord, a "package" which deals with the outstanding technical details on the Bonn Agreement settled by CoP-7 2001,⁹ provides several tasks that should be done by host country institutions, namely tasks concerning the project approval procedures, capacity building and marketing. It also requires the giving of annual reports of the CDM projects progress in respective countries.¹⁰ For a developing country like Indonesia, implementing a CDM policy is a financially interested challenge which has to be borne with.¹¹

II. Carbon Project Development In Indonesia

The CDM potential in Indonesia is very big, for about 20-40 million ton of carbon dioxide equivalent per year, with half of it lies in the energy and

⁸ Michaelowa, Axel. 2003, *CDM Host Country Institution Building*, published in *Mitigation and Adaptation Strategies for Global Change*, 8, 2003, p. 201-220.

⁹ Boyd, Emily. and Schipper, Emma. 2002, *Marrakech Accord—at the Crossroad to Ratification: Seventh Conference of the Parties to United Nations Framework Convention on Climate Change*. Published on the *Journal of Environment Development* 2002, 11, p. 184-191.

¹⁰ *Supra*, Note 2

¹¹ However there are partial negative perspectives on CDM occurred in NGOs, especially among regional NGOs on forestry and agrarian issues. The implementation of sectoral forestry policy has created a problem to some extent, particularly in regard to the rights of local people of forest resources. The lack of information disseminations on CDM in local region, furthermore has stimulated minor perspectives on local region that implementing the CDM is a risky strategy, particularly on forestry CDM projects.

industry sector and the other half in the forestry sector¹². The Indonesian National Strategy Study on the CDM had identified following category as potential CDM projects: renewable-energy sector projects, eco-efficiency energy projects, forestry projects and relevant emission reduction projects such as in agricultural sector. The Department of Energy and Mineral Resources (ESDM) had mentioned the evaluation data that each main province in Indonesia has potential resources on oil drill and/or coal mining to be promoted as CDM projects.¹³ On the forestry sector, the NSS indicated that the critical area needed rehabilitation cover into 32,5 million acre, in which 50 % of these area or 16,3 million acre are potential forest area for the CDM projects.¹⁴

On the energy sector, there are some barriers to promote more investment on the energy-CDM projects. The lack of mutual-share provisions, high investment costs and lack of legal certainty are the main issues in this sector. Meanwhile, the competence of the Ministry of Energy on energy sector is divided into four Directorate Generals (DGs): DG on Electricity and Energy Use, DG on Oil and Gas, DG on Geology and Mineral Resources and DG on Processing and Trading of Oil and Gas.

However the problem do not stop on that various DGs, as each energy sector has their own "master" such as PT. PLN for electricity, PT. PERTAMINA for oil and PT. PG for gas. The arrangement of the National Energy Policy does not necessarily set coordination among these agencies. As a matter of fact, these partial regulations and competences tend to cause difficulties in the procedure. To promote and attract more investment on the energy CDM project, an integrated energy act is indeed can be considered as a good start.

On the forestry sector, the A/R (Aforestation/Reforestation) CDM concept seemed so far from the implementation. The main problem should be managed is the institution factor. Both, central and local institutions on the forestry sector face the same problem. Most policies and regulations are still centralized in order to establish the same standard on forest management. However, on the other hand, the lack of competences from local governments may create ineffective implementation of national policy.

Fortunately, significant step has been made by the Ministry of Forestry

¹² Ministry of Environment, 2001, *the National Strategy Study on the Clean Development Mechanism in Indonesia*, Jakarta: KLH.

¹³ Ministry of Energy and Mineral Resources. 2001, *National Strategy Study on CDM in Energy Sector*, Jakarta: DESDM

¹⁴ Ministry of Environment. 2003, *National Strategy Study on CDM in Forestry Sector – a Technical Report*, Jakarta: KLH

by issuing the Ministry Regulation No. 14/2004 concerning rules and procedures for the Forestry-CDM implementation in Indonesia. Under this regulation, the forestry CDM project can be enacted in production forest area, protected forest area, local/*adat* forest and both state-owned and private non-forest land.¹⁵

Another effort in the forestry CDM sector is the establishment of the CDM Task Force which responsible to provide assistance for investor on A/R CDM under the Ministry of Forestry.¹⁶ This assistance aims to minimize technical problems on the forestry CDM project proposal before it is handed in to the KN-MPB, and the KN-MPB only need to focus on the administrative and the procedure.

In order to create cooperative support from local society as the main stakeholders, the Ministry of Forestry with several NGOs from related issues (forestry, land-use and community developments) have been initiating several activities to promote awareness and understanding from local community on the forestry CDM issue. In the first step, this approach has been implemented in provinces having the energy CDM projects, such as West Java, Lampung, West Sumatra and South Sulawesi.¹⁷

Indonesia has lots of potential resources for the forestry-CDM projects. However the lack of integrated forestry management and also the problem in multiple-sectoral based coordination in autonomy regime might be the main barrier to promote the forestry-CDM projects. Indonesia can copy the ideas from other developing countries such as Bolivia, where the decentralization had contributed to improve social equity in the access to forest resources, strengthen the traditional knowledge and reinforce sustainable practices of forestry management.¹⁸ Thus, the recent development of the environmental management in Indonesia can actually lead to an effective CDM strategy, as long as all the relevant stakeholders can work together for common goals.

The future of the CDM projects in Indonesia is more likely still focusing on renewable energy utilization, which has been commercially devel-

¹⁵ Masripatin, N. 2006, *Preparing the Ground: Indonesia's Arrangements for Forestry Projects under the Clean Development Mechanism*. Jakarta: Ministry of Forestry. Available at <http://www.fao.org/docrep/009/a0413e/a0413E03.htm>

¹⁶ NEDO-New Energy and Industrial Technology Development Organization. 2006, *CDM Development in Indonesia: Enabling Policies, Institutions and Programmes, Issues and Challenges 2006 (Second Edition) – a Compilation*, Jakarta: NEDO.

¹⁷ *Ibid.*

¹⁸ Boyd, Emily, Guitierrez, Maria, and Chang, Manyu. 2005, *Adapting Small-Scale CDM Sinks Projects to Low-Income Communities*. Tyndall Centre for Climate Change Research. Working Paper 71.

oped though limited to hydropower and geothermal. Hydropower projects have long gestation times and high capital costs, which are favorable to achieve long-term emission reduction. Indeed these long-term projects have to be encouraged more, especially in developing countries to set advanced contribution of the CDM in the emission reduction path.¹⁹

Hydropower has been the most successful emissions reduction category in the CDM to date,²⁰ in which 40 of 269 registered projects in the CDM-EB are from hydroelectricity generation.²¹ The KN-MPB should properly maintain the potential resources on hydropower projects, as hydropower projects may not all sustainable and environment friendly, to promote more investments on the CDM.²²

On geothermal activities, Indonesia has started to invest in the attractive geothermal potential in its early compliance period for the UNFCCC. In 2005, Indonesia has proposed geothermal power projects to be included as the CDM projects, in cooperation with CERUPT from the Netherlands. These projects are the Wayang Windu Geothermal Power Unit UU (110 MW) with potential of 750,000 tons CO₂ reduction over 7 years and the Sarulla Geothermal Power Project (200 MW) which has enormous potential of emission reduction up to 6,786,325 tons CO₂ over 7 years.

Unfortunately, both of these proposed projects failed to become the CDM projects. The Wayang Windu projects failed after 1-year negotiation with the Dutch Certified Emission Reduction Unit Procurement Ten-

¹⁹ Michaelowa, Axel. 2005, *CDM: Current Status and Possibilities for Reform*. Hamburg: HWWI Research Paper.

²⁰ Power generation from renewable energy – e.g. wind, solar energy, earth energy, hydropower and biomass – provides heat and electricity from natural resources that are not depleted over time. Resources which can be used without an impact on the climate system are called zero-emission sources. Zero-emission technologies do either not generate emissions (water power) or generate emissions that are exactly as high as what has been absorbed before in the lifecycle (biomass). Oil, gas and coal are not considered as zero-emission fuels, because the absorbance of emissions and the re-emission do not take place in one lifecycle.

However, not all uses of renewable energy are zero-emission, due to the fact that they are not all sustainable and environmental friendly. Such as large hydroelectric projects, which pen up water reservoirs behind dams can have negative environmental impacts on rivers, fish and surrounding land.

Muller-Pelzer, Felicia. 2004, *the Clean Development Mechanism: a Comparative Analysis of Chosen Methodologies for Methane Recovery and Electricity Generation*. Hamburg Institute of International Economics.

²¹ Whittington, Ruth. 2007, *Hydro and the CDM: the Role of Hydro Electricity in meeting Kyoto Obligations*. Elsevier Ltd: Refocus January – February 2007.

²² Indeed, in Soeharto's era, Indonesia has several problems on the hydropower energy plant, particularly on the socially sustainable criteria. The problems were related to the land-use compensation for local community. Hydropower CDM projects, thus should be managed in a strict condition. However, another problem may also be a barrier, particularly if it needs to comply with the standard of the World Commission of Dams which has been adopted by EU Member States recently.

der (CERUPT) because of the unclear decision by the government on the development of the project itself.²³ Meanwhile, the Sarulla project faced a dead-end solution after a change of ownership from the Unocal North Sumatra Geothermal Ltd (UNSG) to PLN – National Electricity Company.²⁴ The takeover of assets and management supposedly create an internal burden when PLN itself had incurred severe deficit during 2004 to 2006.

A lesson might be learned from both cases is that integrated policy for the CDM strategy is necessary for Indonesia. Sectoral regulations may be act as supportive factor, as long as the CDM procedure is integrated. Moreover, clear guidelines for the CDM procedures in oil and gas sector should be established. Currently, the guidelines for the CDM in energy sector do not cover the procedure on oil and gas project. The guideline is necessary to reduce the risks and uncertainties of the CDM in the oil and gas sector.

Another sector significant for the CDM project is biomass-based project which still considered as second-class project. However, the current development on the biomass-based CDM projects such as Baggase Power Plant in Gunung Batin, Lampung Tengah, has demonstrated the advantages of biomass-based projects. This project utilizes the baggase waste from sugar factory to generate electricity to be sold directly to the national grid, which could reduce total emission during 2007-2012 at an estimated amount of around 267.975 tons carbon dioxide equivalent.²⁵

III. Lessons From Several Countries's Best Practices

A. Lesson from Peru and Mexico: Simple Adaptation from Coffee Producers

The recent IPCC Report predicts that by mid-century, increases in temperature and associated decreases in soil water are projected to lead to gradual replacement of tropical forest by savannah in eastern Amazonia.²⁶ Semi-arid vegetation will tend to be replaced by arid land vegetation. Droughts will increase and so will the salinisation and desertification of agricultural land. There is a risk of significant biodiversity loss through

²³ Both projects were stopped by two important reasons that questioned the eligibility of the CDM projects: the change of management of the company (both projects are come from UNSG – a US-based multinational company) and the pressure from the NGOs. At that time, the misinterpretation of the CDM by certain NGOs continued. Certain people thought that the benefit should go directly to the local people and they claimed that large/private companies do not deserve the CER.

²⁴ NEDO Report. *Supra*

²⁵ Restuti, Dewi. and Michaelowa, Axel. 2006, *The Economic Potential of Bagasse Cogeneration as CDM Projects in Indonesia*, Energy Policy 35 (2007) p. 3952-3966.

²⁶ IPCC, *Fourth Assessment Report: Climate Change 2007*. *Supra*.

species extinction in many areas of tropical Latin America.²⁷

Peru is one of the countries most vulnerable to climate change. Several structural deficiencies are increasing this vulnerability. 52% of the population lives in poverty, and another 21% in extreme conditions of poverty.²⁸ A major part of the population works in the agricultural sector and therefore depends on natural resources. This part of the population is directly affected by climate change impacts. The global climate change phenomenon is already influencing people's living conditions negatively.

Between 1990 and 2000, natural disasters increased by six times.²⁹ 72% were of climatic origin. Peru, with 470,000 ha covered by glaciers, possesses 70% of the mountain glaciers within the earth's tropics. The El Niño phenomenon caused a 4.5% loss of GDP (3,500 Mio.US\$) in 1997/98.³⁰ Future scientists predict decreasing water availability and supply as well as a limited generation of hydro-electric power, which is the main energy source in Peru. Studies of PNUMA and UNEP show, that water supply in Peru will be halved by 2050.³¹

While in Mexico, diverse climate models are used to map the climate change with its possible impacts and future climate scenarios are generated for each one of the Special Report on Emissions Scenarios developed by IPCC.³² Most relevant impacts of climate change in Mexico are changes in precipitation and lack of water resources. Agriculture will be affected most by water shortages and the country is especially vulnerable in terms of climate change due to missing resources for adaptation to climate change. Chiapas, Veracruz and Oaxaca represent the states with the highest forest biodiversity and biological productivity. Currently deforestation and forest fires pose a serious threat to these ecosystems, placing the country in the first ranks of deforestation indices.

Coffee production is one of the main rural activities in Peru and Mexico.³³ In Peru, more than 2 million people in 68 provinces in 11 regions are involved in the coffee sector. The coffee supply chain constitutes the

²⁷ Ibid.

²⁸ GTZ, 2009. *AdapCC Final Report - Results & Lessons Learnt*. Federal Ministry for Economic Cooperation and Development.

²⁹ Café Direct. 2009, *Report from Climate Change Impact*. Public-Private-Partnership "AdapCC" Adaptation for Smallholders to Climate Change. GTZ – Café Direct.

³⁰ Ibid.

³¹ Ibid.

³² Ibid.

³³ Café Direct. 2009, *How can smallholder tea and coffee growers cope with climate change?*, Synthetic Report from Public-Private-Partnership "AdapCC" Adaptation for Smallholders to Climate Change. GTZ – Café Direct.

main agri-business export supply chain in the country. The harvesting area is about 330.000 hectar with an average outcome of 788 kg coffee per hectar. The annual harvest is about 650.000 quintal. Coffee production is closely linked with poor rural and traditional agriculture in several regions of the country. 90 percent of the 150,000 smallholder producer families are farming less than 10 hectar. Less than 20 per cent are producing with technological support and only 5 percent are using modern agricultural technologies. The lack of farming technology makes Peru a major producer of organic coffee.³⁴

In Mexico, coffee is the main agricultural export product of the country. The coffee supply chain is aimed at two markets, the national and the international market. The main coffee trading partner countries are Germany, USA, Canada, Netherlands, France and Japan. The production and the management of the fruit of the crop is followed by its processing that includes alkaline fermentation and drying.

Several producer groups are existed both in Mexico and Peru to coordinate and organize smallholder producers. All of the producer groups are aware of climate change and the gradual destruction of the environment. However, none of the producer groups have started specific activities that aim at coping with the impacts of climate change or the destruction of the environment.³⁵ One of the biggest problems for the producer groups is not having meteorological data. They all felt changes in climate that had impacts on their production, but there is no data available in order to set up climate forecasts. The absence of such data makes it even more difficult to develop efficient coping strategies.³⁶

Accordingly, by the project initiated by GTZ, all producer groups have their own ideas for possible adaptation means such as:³⁷ improved land-use and coffee production practices including diversification; improvement of the beneficiaries' infrastructure; improved irrigation techniques as well as awareness raising; information and capacity building on environmental issues; investments in scientific measures to explore seeds' adaptive genetic capacities; incentives for the implementation of adaptation measures in the long-run; forecasting mechanisms for risks, threats and production losses; analyse micro-insurance options; develop a variety of coffee species with high resistance to climate change; reforestation programmes; and less

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³⁴ *Ibid.*

³⁵ *Ibid.*

³⁶ *Ibid.*

³⁷ *Ibid.*

abuse of chemical fertilizers

With a constructive and systematic planning programmes, the coffee farmer in Peru can be educated more about climate change and the adaptation activities they can initiate. Many producers assume the reason of the impacts more to be caused by insufficient education on sustainable land practices such avoidance of burning.³⁸ Another point can be taken from the activities that farmers agreed that in climate change issue, everyone talks about it, but no action is taken.³⁹

In Mexico, from the adaptation projects, many producers have changed to applying organic production activities which show positive effects in regards to soil fertility and product quality. Other than that there have been several trainings and workshops from each organization as well as from the national certification agency Certimex⁴⁰ in order to diversify productively and commercially. Another efforts taken are for example reforestation along river beds; renovation of plots with new coffee trees and a variety of shade trees (agroforestry); promoting more use of organic fertilization and composting; education and awareness raising on environmental issues; and also Water treatment for coffee washing and reducing the amount of water needed for the process.⁴¹

B.Lessons from Caribbean: Small Islands Perspective

The members of the Caribbean Community (CARICOM) are primarily small island states with fragile coastal ecosystems.⁴² SIDS are located mainly in tropical and sub-tropical oceans. Their climate is influenced strongly by ocean-atmosphere interactions which often manifest themselves in extreme weather events such as hurricanes and cyclones.⁴³

Agriculture and tourism are their principal sources of employment and foreign exchange earnings. Coastal areas, holding the vast majority of the population and economic activity, are vital to the prosperity of these countries. Coastal areas are usually the most biologically productive areas, supporting a wealth of live marine resources and characterized by high

³⁸ *Ibid.*

³⁹ *Ibid.*

⁴⁰ http://www.certimexsc.com/quienes_somos.htm

⁴¹ *Ibid.*

⁴² Deeb, Alejandro. 2002, *Lessons Learned from the Caribbean: Planning for Adaptation to Climate Change*. Taken from Climate Change Discussion Papers September 2002 - Environment Department The World Bank. Washington: The CC Team World Bank.

⁴³ Sen, Graham. 2007, *Vulnerability and Adaptation to Climate Change In Small Island Developing States*. Background paper for expert meeting on the adaptation of climate change from small island developing states. Jamaica: the Secretariat of UNFCCC.

biological diversity.⁴⁴ In recent years, these resources have come under increasing stress: intensification of human population and activities; concentration of tourism-related infrastructure; inadequate disposal of liquid and solid wastes; decaying drainage infrastructure; severe weather events which have brought about record losses; and mismanagement of coral reefs, sea grass beds, mangroves, and wetlands. In addition, the lack of comprehensive information systems prevents the integrated management of those resources.⁴⁵

Several activities were initiated in Caribbean, such as coral reef monitoring for climate change; coastal vulnerability and risk assessment; economic valuation of coastal resources; and greenhouse gases inventory and vulnerability assessment of the agriculture and water sectors. From the activities, the Caribbean states have learned that long term vision and sustainability are major requirements for climate change adaptation.⁴⁶ Sustainability can be enhanced through building regional and national commitment and institutional and technical capacity. In situations where national capacity is weak in regional and global issues, a responsive, flexible, regional coordinating mechanism is an effective means of engaging the collective capacity of existing institutions and building capacity by acting as a clearinghouse for information and resources.⁴⁷ As well as the institutional building process, the capacity building of all stakeholders is the most influenced factor needed to be reassured by promoting more education and awareness by strengthening the local expertise (the fishing methods, planting wisdom, and also the culture).⁴⁸

IV. Initiating Small Scale Carbon Project In Indonesia

Another potential for the CDM projects are small-scale projects. The small-scale CDM project is divided into three types according to the modalities and procedure: 1) Renewable energy project with a maximum output capacity equivalent of up to 15 MW, 2) Energy efficiency improvement project reducing energy consumption, on the supply and/or demand side, by up to the equivalent of 15 GWh per year and 3) Projects reducing anthropogenic emissions by sources and directly emit less than 15.000 tons of carbon dioxide equivalent annually. The small-scale CDM projects usu-

⁴⁴ Deeb, Alejandro. *Op. Cit.*

⁴⁵ *Ibid.*

⁴⁶ *Ibid.*

⁴⁷ *Ibid.*

⁴⁸ *Ibid.*

ally developed in Indonesia are the first and the third types, such as renewable-energy generation project and methane recovery project.

Available mechanism to manage the small-scale projects is by bundling and debundling those projects. Bundling mechanism provides the procedure to collect or merge similar small-scale projects, aims to create more financially sustainable and stable project.⁴⁹ The UNFCCC do not limit on how many projects can be organized and bundled into single project, as long as the total product capacity do not exceed the criteria for small-scale project. Meanwhile, debundling can be used in limited criteria to avoid the abuse of fast-track procedure for the small-scale projects.

According to other countries's best practices, the carbon project usually managed through a five-tiered structure representing: Implementing Agency; Executing Agency; the committee as host to the RPIU, with responsibility for financial and general administration; the Regional Project Implementation Unit (RPIU) as coordinator of the implementation of the field components of the project; and the National Implementation Coordinating Units (NICUs) to, inter alia, coordinate and support the execution of activities undertaken by the project in which the government participates.

It is a common knowledge, that sectoral management issues are often regarded as the main obstacle to integrate several activities in Indonesia. In this situation, Local governments indeed should demonstrate more active involvement to encourage the investment on the smallholder carbon projects. With the competence of investments administration, local governments should be more active in promoting the small-scale CDM projects – which is less among the current proposed CDM project in the KN-MPB. Indonesia shows great strength on the community based projects, for example mini hydropower plant project, in which these projects create significant contribution for sustainable development.⁵⁰

Many daily smallscale production activities of diverse sectors in Indonesia can be managed into a more climate-adaptative activities. Not only for actively support the carbon reduction program by more stakeholders,

⁴⁹ EcoSecurities. 2002, *Clean Development Mechanism: Simplified Modalities and Procedures for Small-Scale Projects*. Final Report for Department for International Development. UK: EcoSecurities. Available online at [http://www.ecosecurities.com/ccows-common.nsf/pr/6/\\$File/ESLsmallscaleproject.pdf?OpenElement](http://www.ecosecurities.com/ccows-common.nsf/pr/6/$File/ESLsmallscaleproject.pdf?OpenElement) last accessed on 26 June 2007.

⁵⁰ Small hydropower plant in rural area can achieve significant sustainability achievement such as upgrades industry to become established in the rural area, contributes to an increase of the economic level of the villagers through the presence of economic activities during the development of the project activity, encourages the development of the surrounding area to become cleaner, safer and well arranged. Also, small hydropower plant if implemented properly will have no influence on water use for fishery and agriculture.

but also can gain more prospective investment from the developed states, mainly those who have an annex-A obligation.

However, stimulating the investment on the small-scale projects, the local governments supported by NGOs must raise more public awareness on the CDM. The NGOs mentioned here should be all related NGOs, not only from NGOs which concerns on the CDM policy, but should also the NGOs from relevant issues such as environmental NGOs, forestry NGOs, or even NGOs focussing on the policy studies. Indeed, before stimulating the public awareness of the society, the government officers and NGOs activists should raise their own awareness first. With cooperative coordination and excellent teamwork from all stakeholders, the CDM strategy indeed can be "bewitched" into valuable asset to promote the sustainable development in Indonesia.

V. Closing Remarks

Aside all those description of the current development on the carbon project in Indonesia, major obstacle we should realize is that Indonesia is lack of climate change scenarios. We barely have a comprehensive and obscure data and the mechanism on the adaptation and mitigation of climate change. To support the future development of climate change scenarios, Indonesia must initiate activities to improve on the resolution of climate change scenarios through "downscaling" the information from global circulation models. Thus, we will have concise "structure" on the diverse impacts of climate change to diverse sectors and the adaptation mechanisms might be applied.

Another point we should considered is the limited skill base (Human Resources). Human development strategy should focused more on building and strengthening institutional capacity. This activity indeed must be held by working together, not only between government and community, but also between governments in regional plane (ie. ASEAN). Coordination, administration, public relations and political dialogue required the committed, enthusiastic and motivated professionals. It also demanded much time and effort. To fulfill this goal, we need "soft" technologies used indeveloping local and regional climate models to reduce uncertainty in vulnerability issues as well as need for development of capacity and know-how in climate change assessment across all sectors (cross-cutting issues).⁵¹

⁵¹ Kumarsingh, Kishan. 2007, *Case Studies of Technology Transfer - Projects and Partnership: a Small Island Perspective*. Trinidad-Tobago: the Secretariat of UNFCCC.

Last, more public education is the most significant issue we must urged today. In Indonesia, climate change is still an “above the sky” issue. Thus to promote more active participation from stakeholders on smallholder carbon projects, one thing we must change is the perspective and acceptance of climate change issues to be more “Down to Earth”.