

IMPLEMENTATION OF A/R CDM IN INDONESIA: INSTITUTIONS AND MECHANISM¹

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INTRODUCTION

Aforestation and Reforestation Clean Development Mechanism. (A/R CDM) of the Kyoto Protocol considered as one of incentives to increase the pace of rehabilitation and reforestation that badly needed in Indonesia. This is because, more than 55 per cent of land in Indonesia is considered critical. On the other hand, government budget for rehabilitation and reforestation is limited to undertake 5 percent of critical land (Soenaryo, 2005).

There are many papers contributing toward making the CDM a reality. Michaelowa (2003) discusses the institutional infrastructure needed by countries wishing to engage in CDM projects. Yamada and Fujimori (2003) present an overview of the CDM project cycle and discuss procedures for the project design phase, they emphasize the need for developing clear guidelines and project design tools. Fitchner et.al (2003) discuss the impact that transaction costs will have on the participation of private investors in the project-based Kyoto mechanism. Cacho and Wise (2005) classify transaction costs in A/R CDM by five category, i.e., (i) search and negotiation, (ii) approval, (iii) project management, (iv) monitoring, and (v) enforcement and insurance.

This paper present an overview of institutions and approval mechanism of A/R CDM implementation in Indonesia, and other related aspects.

THE STATUS OF A/R CDM INDONESIA

Indonesia commitment to A/R CDM is supported by several law and governemnt regulation relevant to CDM implementation, NSS, MOE (2003). Ginoga, et.al. (2004) mentioned there are four law relevant to CDM implementation, i.e., UU No. 6/1994, UU No. 23/1997, UU No. 22/1999, and UU No. 41/1999. While Government Regulation (PP) that can become a references are PP No. 25/2000, PP No. 4/2001, dan PP

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No.34/2002. Presidential Decree (Keppres) are Keppres No. 127/2001 and Keppres No. 118/2000. And Ministerial Decree relevant to CDM are Forestry and Environment, including KepMenHut No. 20/2001 and KepMenHut No. 70/2001. While KepMenLH relevant to CDM are KepMenLH No. 53/2003, KepMenLH No.141/2003, KepMenLH No. 17/2001 and KepMenLh No. 206/2005.

Currently, there are many research institutions, university, policy makers, practitioners, project developers, and non-government organisation involved and get together and share the lesson learned in A/R CDM, which can eventually improve the understanding of the links for CDM implementation. Several research activities is also being undertaken, including, CIFOR funded by CIDA, Forest Research Organisation and Development Agencies (FORDA) funded by JICA and ACIAR, TA. ADB, ICRAF, Wetland Organisation, and Local Government such us Forsetry Profincial Office of West Nusa Tenggara funded by JIFPRO.

Most of these research recommended that carbon sequestration project through land-use, land use change and forestry activities could demontrate a win-win situation from the point of view of climate change and sustainable development. Properly design project of A/R CDM can conserve and increase carbon stocks and at the same time improving rural livelihoods.

TA ADB project in paricular aims to earn Certified Emission Reductions (CERs) which are measured in tonnes of CO₂ for at least four PDD from four districts in Indonesia, i.e, (i) Sidenreng Rapang District, in the Province of South Sulawesi, (ii) West lampung District in Lampung Province, (iii) Deli Serdang district in North Sumatra Province and (iv) Hulu Sungai Selatan district in South Kalimantan Province. The four PDD, that will be finished this march 2006 is hopely will open up opportunity for A/R CDM Indonesia in the CERs market.

A/R CDM INSTITUTION AND MECHANISM IN INDONESIA

CDM process in Indonesia can be seen in Figure 1. It starts with developing project proposol and project design document (PDD). This PDD is developed by project proponent. Based on Ministerial of Forestry Decree No. P. 14/ Menhut-II/2004, these proponent could be individual farmers, oprivate sector, national or regional state corporation, or cooperative that willing to sell carbon. Steps for CDM implementation

can be describe in Figure 1. A project proponent must follow the project cycle process from project design through issuance of certified emission reduction (CERs).

The first two steps, project design and approval are conducted at the country level and are the focus of this paper. In Indonesia, to successfully complete those two steps, a proponent must secure a confirmation letter from local government officials, an endorsement letter from the MOF CDM Working Group, and approval letter from DNA or (*Komisi Nasional Mekanisme Pembangunan Bersih*). Detail of this steps and requirement can be seen in Table 1.

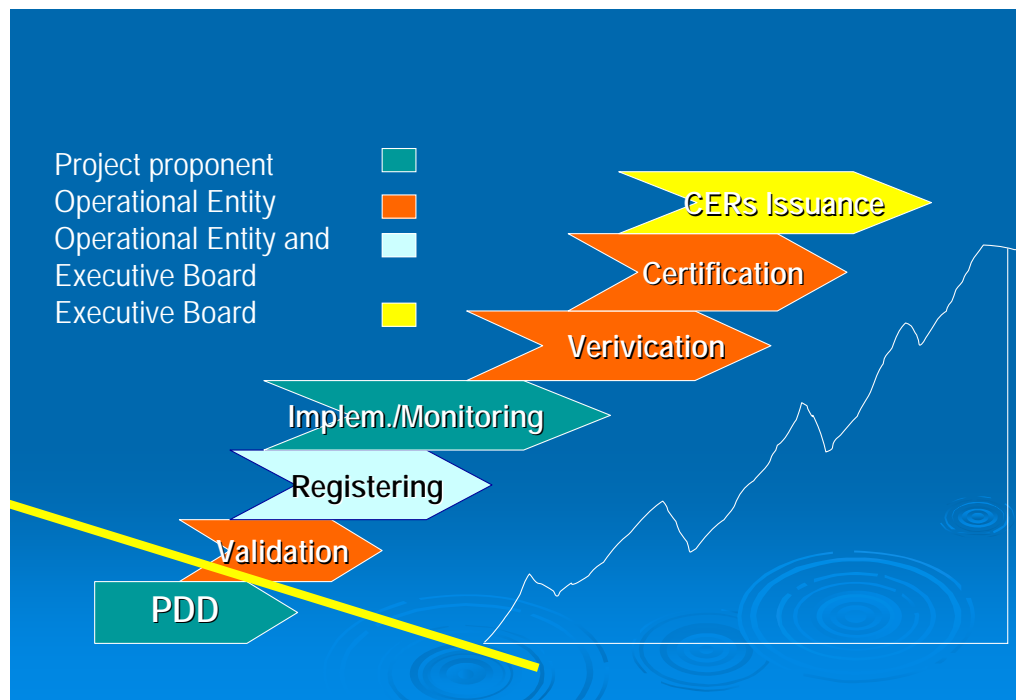


Figure 1. CDM Project Cycle

1. PDD Development

The format of PDD mainly consist of (i) general description of project activity, (ii) project baseline and additionality, (iii) project monitoring plan, (iv) environmental impacts of the project and socio-economic benefits, (v) stakeholder comments, and (vi) other project documents relevant to the project. Precondition before developing PDD were mainly located in the local level, where the project site is proposed. Local institution needs to assure several requirement as mentioned in several law and regulation such as: (i) land eligibility, i.e, at 31 December 1989 the areal have no forest and,(ii) land sertificate assuring that the land is free from conflict, proofed by a letter from head of district/sub-

district, (iii) land map with 1:10,000 scale, (ii) for land categorised as forest land need to have either environmental service permit (*Ijin Usaha Pengelolaan Jasa Lingkungan, IUPJL*) or wood forest product permit (*Ijin Usaha Pengelolaan Hasil Hutan Kayu, IUPHHK*) from regional office or ministerial of forestry office.

Tabel 1. Steps and Requirement for Getting CERs

No.	Steps	Actors/Organisations	Location	Requirements
1.	PDD	Project proponents (Individual, Private sector, Cooperative, BUMN (National Corporation), BUMD (Regional Corporation)	Local	<ul style="list-style-type: none"> • Letter of land eligibility for CDM from Head of district/subdistrict with map of land scaling 1:10 000 • Project proposal, and • Environmental service permit/Wood Forest Product Permit for forestry land • Usefruct righ for other state land, • Land sertificate for private land , • Land community right for community land
2.	PDD Aproval	Project proponent to DNA with attachment to Ministry of Forestry	National	<ul style="list-style-type: none"> • PDD with CDM Format
3.	Validation of PDD	Entitas Operational asked by project proponent a	International	<ul style="list-style-type: none"> • Letter of recommendation from Ministry of Forestry mentioning that the project is synergy with forestry sustainable development • Approval from DNA mentioning that the project synergy with sustainable development • Fund availability for validation in the field
4.	Reporting of Validation Result and Registration	EO to CDM EB	International	<ul style="list-style-type: none"> • PDD is valid
5.	Implementation	Project Proponent	Local	<ul style="list-style-type: none"> • PDD is registered in CDM EB • Fund is available
6.	Monitoring	Project Proponent	Local	<ul style="list-style-type: none"> • Readiness for monitoring • Fund is available • Reporting to EOI
7.	Verification and sertification	EO to CDM EB	International	<ul style="list-style-type: none"> • Monitoring report from project proponent • Fund is available • Verification is approved
8.	Issuance of CERs	CDM EB to projcet proponent	International	<ul style="list-style-type: none"> • All regulation is fulfilled

Source: Ginoga, 2005

Hence, there are several aspects that need to be considered in making PDD including : (i) land eligibility, (ii) Common Rule of land tenure, and (iii) Socio Economic Impact. While specific attention need to be address to issue such as smallscale A/R CDM

Land Eligibility and Land Tenure

Land eligibility is very important issue for A/R CDM in Indonesia, due to several factors such as socio-economic (population density, income, education level, poverty, illegal logging, etc) and biophysical (low fertility, dry climate, fire, etc) factors, therefore risk for land conflict, which has negative further effects in need to be address clearly before implementation. That is why MOF Decree No. 14/2004 oblige documents submitted by project proponents as seen in Table 2.

Table 2. Land Eligibility

No	Type of land
1	<i>If the proposed site is private land</i> , the proponent must submit a letter from head of the sub-district confirming the proposed project site is CDM eligible.
2	<i>If the proposed site is state land</i> , the proponent must submit a letter from head of the district or municipality confirming the proposed project site is CDM eligible.
3	<i>If the proposed site is private land</i> , the proponent must submit: (i) a certification of landownership; or (ii) a valid attestation letter confirmation landownership from the head of the village.
4	<i>If the proposed site is non-forest state land</i> , the proponent must submit a right to cultivate permit (<i>Hak guna usaha, HGU</i>) as stipulated in Government Regulation PP40/1996.
5	<i>If the proposed site is state forest land</i> , the proponent must submit: (i) an environmental service carbon trading permit (<i>Izin usaha pemanfaatan jasa lingkungan perdagangan karbon, IUPJL</i>); or (ii) forest plantation wood production permit (<i>Izin usaha pemanfaatan hasil hutan kayu pada hutan tanaman, IUPHHK-HT</i>); or (iii) traditional forest management rights permit (<i>Hak pengelolaan hutan adapt, HPHA</i>).

A. AR-CDM Projects on State Forest Land

According to the Minister of Forestry Regulation Number P14/2004, the land management permit required to implement an AR-CDM project on state forest land is a:

- (1) Permit for environmental service carbon trade (*Izin usaha pemanfaatan jasa lingkungan perdagangan karbon*, called IUPJL); or
- (2) Permit for forest plantation wood production (*Izin usaha pemanfaatan hasil hutan kayu pada hutan tanaman*, called IUPHHK-HT); or
- (3) Permit for Traditional Forest Management Rights (*Hak Pengelolaan Hutan Adat*).

IUPJL. Under PP34/2002, the time span for environmental service utilization in protected (article 23 paragraph 2) and production forest areas (article 35 paragraph 2) is 10 (ten) years with possible renewal for an additional 10 year period. The number of permits is limited two permits per provinces per permit holder and maximum area per permit is only 1000 (one thousand) hectares. Article 39 of the regulation specifies that the IUPJL permit is given to the:

- a. Head of District (Bupati) or Mayor of City with a copy to the Minister, Governor and related institution in local forestry sector, if the area is located in a District or City.
- b. Governor with a copy to the Minister, the Head of District (Bupati) or the Mayor of City if the project area crosses two or more districts in the same province.
- c. Minister of Forestry with a copy to the Governor and the Head of District (Bupati) or the Mayor of City if the project area crosses two or more provinces.

IUPHHK-HT. If an entity has already holds a permit for forest plantation wood production (IUPHHK-HT), the entity can propose AR-CDM project to be implemented in its concession area without having to request an IUPJL permit. Thus the rules and requirements under the IUPJL regulation (PP34/2002) **will not apply**. An entity wishing to participate in AR-CDM who does not hold an IUPHHK-HT permit can apply for an IUPHHK-HT permit and treat the AR-CDM project as additional activities in its concession area. According to article 35 of PP34/2002, the lifespan of the project can be a maximum 55 years without area limitation, and can be renewed provided all requirements for permit renewal are satisfied. Process of getting permit for IUPHHK is described in Minister of Forestry Decree (SK MENHUT) No. 32/KPTS-II/2003. The issuance of this permit is based upon an auction mechanism.

HPHA. AR-CDM projects may also be implemented on traditional forest land (Adat Forests or *Hutan Adat*). Any community holding Adat Forest Management Rights (*Hak Pengelolaan Hutan Adat/HPHA*) can develop an AR-CDM project on its traditional forest land. All other requirements relating to AR-CDM projects implementation must also be met.

B. AR-CDM Projects on Non-Forest State Land

The type of permit required for implementing AR-CDM projects on non-forest state land is a right to cultivate (Hak Guna Usaha or HGU) as stipulated in Government Regulation PP40/1996. This regulation also governs the right to build (Hak Guna Bangunan or HGB) and the right to use (Hak Pakai). The right to cultivate can be granted to Indonesian citizens or legal entity. It initially covers a thirty-five year period and can be extended for another twenty-five years. If an entity already holds a HGU, for a coffee/cacao plantation for example, it can use some of the land covered by the HGU for an AR-CDM project, as long as the AR-CDM project is not the main activity. For such cases, the entity needs to provide (i) proof of HGU, (ii) a confirmation letter from local authorities regarding the site's eligibility for AR-CDM, and (iii) AR-CDM project proposal.

Smallscale Projects

Smallscale afforestation and reforestation (AR) project activities under the Clean Development Mechanism (CDM) may also need to follow the stages of the project cycle in the modalities and procedures for AR project activities under the CDM contained in the annex too decision 19/CP.9. PDDs for smallscale projects, those that have a maximum Net Green House Gas removals by sinks (NGHGR) of 8 ktons CO₂-equivalent per year. The PDD for smallscale with simplified modalities and procedures for smallscale AR CDM. The proponent is also has to be considered a low income community⁴

Based on JIFPRO projects in Cianjur West Java and Lombok Timur, West Nusa Tenggara, estimation of transaction costs (TC) for smallscale or very smallscale project was very high, as can be seen in Table 3.

Transaction costs involved before and after project implemented. Estimation ex-ante and ex-post projects can be seen in Tabel 3. This estimation based on interview with stakeholder/project participants involved in NTB and Cianjur

Total TC in NTB was Rp 909,920,000. In this case, certification, verification and validation is estimated based on costs for wood certification or ecolabelling in Indonesia with national accreditor (Prasetyo, 2005).

⁴ Definition of low income community is defined by the host country. KomNas MPB will need to determine the definition of poverty that applies to smallscale AR-CDM projects.

If the costs for CDM project with total areal of 150 ha is Rp 2.323.200.000 or equivalent to 27,902,500 Yen (dengan nilai tukar 1Yen = Rp 80). So this TC is about 28.1 per cent of the total costs. This costs meet that range of reseach done by Cacho and Milne (2003), which estimated TC of about 6 to 46 % of the total costs.

Table 3. Estimation of Transaction Costs in JIPRO proyek di NTB dan Cianjur

No	Activities	NTB				West Java			
		Costs	%	Time	Actor	Costs	%	Time	Actors
		Rp Juta				Rp Juta			
1	Searching of locationi	94	10.33	6 mth-1 yr	JIFPRO and PFO staf	38,5	7.94	1 minggu	BP DAS Citarum- Ciliwung, Dinas PKT Cianjur dan staf JIFPRO
2	Land eligibility processing	2,5	0.27	1-6 mth				1 minggu	Dinas PKT Cianjur
3	Drafting PDD	35	3.85	1 wek- 1mth	Proponent	14	2.89	10-20 hari	BP DAS Citarum- Ciliwung
4	Letter Recommendation from MOF	-		Maks 3 mth	CDM Working Group	-			
5	PDD Submission	0,02	0.002		Posted	0,3	0.06		
6	Approvel/Revising of PDD	-		Min 1 mth	DNA	-			
	Ex-post								
7	Baseline-Additionality	30	3.30		Proponent	-			
8	Monitoring&Evaluation (proyek JIFPRO)	128	14.07		Independent team	24,4	5.04		
9	Sertifikasi (Ekolabel)1) including verification and validation	400	43.96	6 mth		400	82.52		
10	Partnership used university students	20,4	2.24			-	0.00		
11	Environmental sertificate (Biaya Pengurusan AMDAL)	200	21.98	Maks 2 yr	Accreditor based on Gov. decree	7,5	1.55	6 bulan atau lebih	Accreditor based on Gov. decree
12	Total	909,9	100			484,7	100		

Source: 1)Prasetyo, 2005.

Source: Ginoga, 2006

For Cianjur, due to very small area, so the TC is very high, i.e., Rp 484,7 million, or more than 300 per cent of the total costs. If the sertificate ecolabelling costs is excluded, this costs is about 21.9-36.9 per cent. Therefore the highest cost was cost for sertification including verification and validation, amounting to 43.96 % .

It is worth to note that both trial project of A/R CDM above was funding by JIFPRO as an initial investor, therefore initial investor is needed for getting the project started. Because it is very unlikely, particularly for small holder dealing with small scale land to incur extra cost to get several requirement to be attached in PDD, such as land map, land certificate, etc

In order to reduce transaction costs, modalities and procedures are simplified for smallscale AR project activities as follows:

- a). Project activities may be bundled or portfolio bundled at the following stages in the project cycle the project design document, validation, registration, monitoring, verification and certification. The size of the total bundle should not exceed the limits stipulated in paragraph 1 (i) of the modalities and procedures for AR project activities under the CDM;
- b). The requirements for the project design document are reduced;
- c). Baseline methodologies by project type are simplified to reduce the cost of developing a project baseline;
- d). Monitoring plans are simplified, including simplified monitoring requirements, to reduce monitoring costs; and
- e). The same operational entity may undertake validation, and verification and certification.

Social Economic Impact

The evaluation of a CDM project's contribution towards 'sustainable development' must be checked against a country's national sustainable development objectives, as stated in official government documents, i.e, Ministry of Environment Decree No. 206/2005.. Specifically for AR-CDM projects, the GOI established 14 criteria, consisting of 42 indicators, of sustainable development (MOE 2003). Those criteria and indicators were intended to be applicable to all possible AR-CDM project situations. However, it was not intended that all indicators be used to evaluate every proposed AR-CDM project. More recently the MOE (2005) recommended that KomNas MPB use 6 criteria, consisting of 16 indicators, of sustainable development for all CDM projects. Those criteria and indicators cover environmental, economic, social and technology issues; and are adequate to evaluate all perceivable AR CDM projects. The social and economic criteria has to ensure that the reforestation of degraded lands will not decrease employment opportunities for local communities, and may in fact increase employment opportunities in the medium term. Similarly reforestation activities will not result in diminished public services to local communities.

A written statement of local stakeholder consultation and support is required before local government officials can issue a letter confirming the proposed AR project is CDM eligible. Additionally, a report on the public consultation process implemented

with local communities must be submitted with the PDD. These two documents should confirm that this criteria and indicators have been met. If the PTT is dissatisfied with the details of the community participation and consultation they can require an additional stakeholder meeting.

A. Economic Impact

Economic welfare of the local community is maintained

Indicator 1: Community employment opportunities are not decreased.

Indicator 2: Agreements exist among stakeholders to address the negative impact caused by any decrease in employment opportunities.

Indicator 3: Agreements exist among stakeholders to address the negative impact caused by any loss of employment opportunities.

Indicator 4: The quality of the public service provided to the local community is not diminished.

B. Social Impact

Community Participation Exists

Indicator 1: A consultation process with the local community exists.

Indicator 2: Procedures for responding to inputs and complaint from the community exist.

Community integrity is not negatively impacted.

Indicator 1: Conflict within the local community is not increased.

d. Environmental Impact

Environment conservation and biodiversity is maintained through sustainable use of natural resources.

Indicator 1: Ecological functions are preserved

Indicator 2: Environmental quality is not reduced

Indicator 3: Biodiversity is preserved

Indicator 4: Landuse regulations are observed

Local community safety and health is maintained.

Indicator 1: Community health conditions are maintained

Indicator 2: Work safety regulations are observed

2. National Approval of PDD

Institution involved with PDD approval mainly Ministry of Forestry through CDM Working Group of Ministry of Forestry and DNA or *Komisi Nasional (Komnas MPB)*.

CDM Working Group of Ministry of Forestry

MOF CDM Working Group was formed in response to requests from the national government and is mandated to facilitate and guide stakeholders and project proponents in preparing and/or evaluating AR-CDM projects. The working group is responsible for assuring that AR-CDM projects submitted by proponents are in line with national forest policy and sustainable forest management (including environmental criteria as stated in the national sustainable development criteria, Ministry of Environment Decree No. 206/2005).

Before issuing the endorsement letter the working group must evaluate the documents submitted by the proponent to ensure the documents meet the stipulated criteria. The documents to be submitted to the MOF are: (i) the confirmation letter from local government; (ii) the legal documentation confirming land status (proof of land ownership or land management right); and (iii) an AR-CDM project proposal. Once these conditions are assured the Working Group should issue an endorsement letter to the proponent. An endorsement letter is required before any AR-CDM project can be approved by DNA.

DNA of Indonesia

As mentioned in Ministry of Environment Decree No. 206/2005, The *National Commission for CDM (Komisi Nasional Mekanisme Pembangunan Bersih – KomNas MPB)* is the national DNA for Indonesia. It is responsible for all CDM activities in Indonesia including inter-organizational collaboration. The main body of KomNas MPB is the National Executive Board (NEB) which chaired by Dra Masnellyarti Hilman, MSc. from the Ministry of Environment (MOE), and has 5 (five) members, i.e. Dr. M. Hikman Manaf from Ministry of Energy and Mineral Resource, Dr. Sunaryo from Ministry of Forestry, Ir. Agus Tjahajana, MSc, from Ministry of Industry, Mr. Susanto Sutoyo from Ministry of Foreign Affair, and Drs. Seman Widjoyo, MSi from Ministry of Home Affair. While there are ten (10) Permanent Technical Team chair by Ir. Sulistyowati, MM from Ministry of Environment, and members are: Ir. Suyartono from Ministry of Energy and Mineral Resource, Dr. Nur Masripatin from Ministry of Forestry, Ir. Agus Wahyudi, MM, from Ministry of Industry and Trade, Ngurah Swajaya from Ministry of Foreign Affair, Prof. Dr. Tjahya Supriatna from Ministry of Home Affair, Ir. Dedi Darmawan from Ministry of Transportation, Dr. Gatot Irianto from Ministry of Agriculture, Dr Agus

Prabowo from Ministry of National Development Planning (Bappenas), and Ms. Eka Melisa from WWF Indonesia. The DNA is assisted by a secretariat, a permanent technical team (PTT), and a non-permanent team (NPTT).

To promote efficiency and consistency, Dr Sunaryo and Dr Masripatin from Ministry of Forestry who are chair and member of MOF CDM Working Group are also represent member of DNA and PTT.

Process of getting approval for A/R CDM can be seen in Figure 2. It can be seen that Ministry of Forestry in that Figure are replacing on step of getting approval, i.e., evaluation by sectoral team. In this case, if the proponent have got letter of recommendation from Ministry of Forestry, this steps can be eliminated and continued on to be submitted directly to the Secretariat of DNA. Secretariat of DNA is regulated by DNA Chair Decree No. 1/2005. It is mentioned that this secretariat coordinated by Ir. Gunardi from Ministry of Environment. Secretarist is Mr. Prasetyadi Utomo and they have 5 members, all from the Ministry of Environment.

The rest of the process (validation up to certification) implemented by international institutions, except for implementing and monitoring project activities. In this case, intermediaries could be involved, because of international process having strong knowledge, understanding background of project, skill about methods for baseline and additionality, language, access to international forum, and fund.

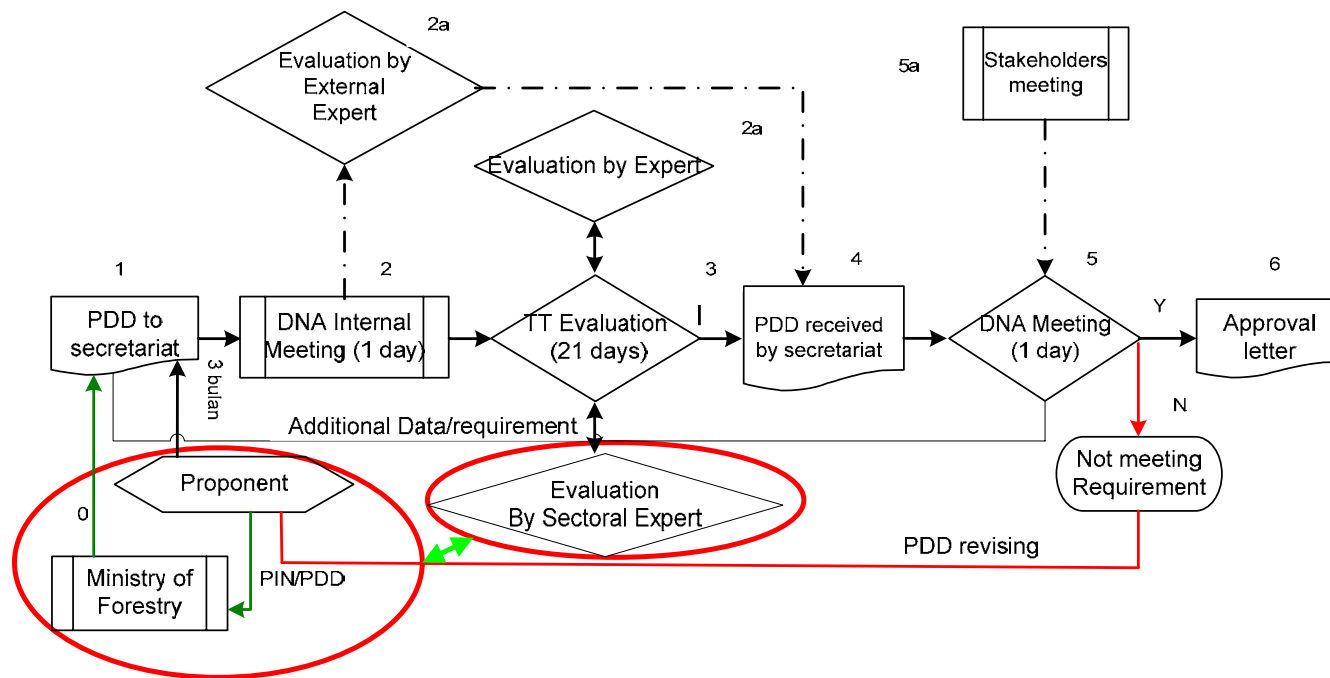


Figure 2. Process of A/R CDM Approval within DNA in Indonesia

CONCLUSION

In general there are three institutions involved in A/R CDM Indonesia, Local Institution, National Institution, and International Institution

Local Institution need to assure the eligibility of the proposed site, including land, social and stakeholders involvement. Therefore the need for local institutions to establish Local CDM Committee is encourage to easier the coordination, synchronisation and facilitation within local level, as well as improve communication with national level. National Institution mainly consists of DNA and CDM Working Group of Ministry of Forestry. This institution is clearly guided by Ministry of Environment Decree No. 206/2005, and Ministry of Forestry Decree No. 14/2004. International Institutions deals with steps after having national approval as seen in Figure 1.

Several aspects need to be addressed specifically to minimise risks and ensure benefit of A/R CDM implementation, such as: land eligibility, socio-economic and biophysical impacts, land tenure, transaction costs, and finding initial investor.

Due to high TC and implemented by low income community, A/R CDM Smallscale need to have special treatment for implementation.

References:

- Cacho, O. and Russel Wise. 2005. Transaction and Abatement costs of agroforestry projects for carbon sequestration. A paper presented at SAFOD-ICRAF Workshop. Malang.
- CIFOR. 2005. Perangkat hukum proyek karbon hutan di Indonesia.
- Fichtner, W., Graehl, S., and Rentz, O. 2003. The impact of private investor's transaction costs, Efficiency and Supportive Governance, The Clean Development Mechanism: A User's Guide, New York, United Nations Development Programme, pp. 55-68.
- Ginoga, K.L. M. Lugina, D. Djaenudin, and N. Parlinah. Policy analysis for CDM Forestry Deployment in Indonesia. *Forestry Socio-Economic Journal* Vol. 1., No. 1.
- Ginoga, K.L. M. Lugina, D. Djaenudin, Y.C. Wulan and Oscar Cacho. 2005. Project Design and Transaction Cost of JIFPRO Project in NTB. *Aciar Working Paper*.
- Michelowa, A. 2003. CDM host country institution building. *Mitigation and Adpation Strategies for Global Change*. 8:201-220.
- Ministry of Environment Republic of Indonesia (2003). Final report, National Strategy Studies on CDM Forestry Sector. Jakarta
- Soenaryo. 2005. Keynote Speech on JICA Workshop. Bogor.
- Yamada, K., and Fujimori, M. 2003. Technical procedures for CDM project design. *Mitigation and Adaption Strategies for Global Change*. 8:221-235.