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Concept of Regional CDM Approval Body - Bundling DNAs: Case of West African Economic and Monetary Union (WAEMU)

Abstract: The Marrakech Accords established a set of rules for the CDM, indicating the important responsibilities for the host developing countries such as the approval of CDM projects. Hence, countries have to establish their approval body, which is the Designated National Authority (DNA). However, the Marrakech Accords did not specify that the CDM approval body must not be created at national level. Hence, it could be possible to create a regional CDM approval body. It has never been an attempt to discuss the CDM institution building at the regional level. This study is an attempt to fill the gap. This study proposes innovatively an option to establish a joint Approval Body among countries with limited CDM potential.

Keywords: CDM Institution building Regional CDM Approval Body, transaction costs, Economies of scales

Concept d'Autorité Régionale d'Approbation des projets MDP- Consolidation des AND, une étude de cas des pays de l'UEMOA

Résumé : Les accords de Marrakech ont fixé les règles devant régir le Mécanisme pour un développement Propre (MDP) incluant, la responsabilité accrue des pays hôtes du sud, telle que l'approbation des projets MDP. Ainsi, les pays doivent mettre en place leur organe d'approbation des projets qui est connue sous le nom d'Autorité Nationale Désignée (AND). Cependant, ces accords ne spécifient pas que les AND doivent être crée au niveau national. Ainsi cette étude analyse les possibilités de créer une autorité régionale d'approbation des projets MDP. La présente étude complète celles menées jusque là en proposant un concept novateur d'autorité régionale d'approbation. L'intérêt de cette étude est qu'elle montre que l'options de l'autorité sous - régionale minimise les coûts de transaction qui sont de véritables barrières pour les pays à faible potentiel de projets MDP.

Mots clés: Mise en place des institutions du MDP, organe régional d'approbation des projets, coûts de transaction, économies d'échelle
J.E.L. Classification: F53; Q01; Q28; Q56

1. Introduction

In the Marrakech Accords, the international community established a complex set of rules for the CDM, including a project cycle, indicating certain important responsibilities for the host developing countries such as the national approval of CDM projects. Hence, countries have to establish their approval body, which is termed the Designated National Authority (DNA). The DNA´s importance lies in the fact that it is the link between a host country and the international CDM Executive Board. Moreover, its approval means that a CDM project is in accordance with a country's development policy. In fact, the countries in the West African Economic and Monetary Union are just in the process of establishing their DNAs, of which, apart from Guinea Bissau and Togo, the six remaining countries of the WAEMU have notified their DNAs to the CDM Executive Board[1].

Most of the studies and discussions on the DNA structures in Latin America and Caribbean have revealed the DNAs´ inability to be financially supported by the host developing countries (Figures et al., 2002a). Similar studies done on China, India and Indonesia came to the same conclusion (Michaelowa 2004a). These countries are still looking to additional foreign funding for support. The different researches on the DNA have suggested that host countries should provide an adapted DNA design in order to reduce the transaction costs (Figures et al., 2002b).

Moreover, until now all the discussions on the DNA have been carried out at the national level. There has never been an attempt to discuss the CDM institution building at the regional level. Hence, this study is an attempt to fill the gap. Based on the results, this study proposes innovatively to establish a joint DNA among countries with limited CDM potential.
The rationale of this option is that bundling the DNA leads to reduction in transaction costs related to the CDM institution building and operation.
Since the scope of this study is to analyse possibilities of transaction costs reduction at the DNA level, the study will not consider transaction costs linked to the whole CDM project cycle, but only with respect to the DNAs. As a DNA is an institution that needs to be created, managed, maintained, updated, and fed with information to carry out its work, the study defines transaction costs as the costs of resources utilised for the creation, maintenance, use, change and all such related costs typical of institutions and organisations. Based on this, DNA transaction costs could be divided into fixed and variable costs.

The analysis here is based on transaction cost theory and institutions analysis.
The added value of this paper is its analysis of the novel concept of bundling CDM institutions, which has not discussed so far.

[1] See: http://cdm.unfccc.int/DNA.

2. Methodology

In a broader sense, a transaction is defined as an act of the exchange of goods (Coase 1960; Williamson 1991). In recent years, a huge amount of literature on transaction costs (TAC) from different disciplines has been developed. For more information on the main issues addressed in the theory of transaction costs and determinants of transaction costs see Furubotn (1994), Williamson (1993), (1996) and Coase (1960). For the purpose of this research, a transaction is defined as either a group of processing steps that is treated as a single activity to perform a desired result, or a set of operations for which it is important that all succeed or fail (Soares 2004), and transaction costs are costs that arise due to the existence of an institution, in other words institutional costs (Cheung, 1992).

Since the study deals with transactions at the level of DNA, it is important to specify DNA transactions. The DNA transaction could be defined as the activities of setting up and professionally running the DNA.
The current study does utilise only literatures on TAC determinants relevant for analysing costs at an institutional level such as the DNA. Thus, the study utilises the discussion on political transaction cost, which is described below.

2.1. Political transaction costs

Political transaction costs are the costs of setting up an institutional framework in which transactions take place (Richter and Furubotn, 1991). Thus, political transaction cost of a DNA is the cost of the theoretical framework for a professionally performed task.
Two categories of political transaction cost can be distinguished:
The cost of establishing, maintaining and changing a system's formal and informal political organisation, the so-called development costs (Banuri et al, 2001, p. 52). These TAC could be considered as information exchange costs and could appear before and after a structure had been set up. Thus, we have "ex-ante" TAC which encompass information, negotiation and contract costs (Woerdman 2001, p.218) The running costs of the institutions till the costs of their updating (Woerdman 2001, p.218). These cost categories can be extended to ex-post TAC, which concerns control, adaptation of contracts to new environment or new constellation, monitoring and enforcement cost. With respect to a DNA, these costs could be referred to as fixed costs and variable costs. This study will show how this cost category could be reduced through a regional or bundled DNAs.

2.2. Measuring Transaction costs

The assessment of a DNA's transaction costs is based on well-known definitions. The research does not assess the costs of the whole CDM project cycle. Thus, transaction

costs of DNA are fixed costs and variable costs that accrue from setting up and professionally running a DNA.

2.2.1. Fixed costs

A large share of the costs of running the DNA is fixed. *Fixed* costs include outlays for setting up the secretariat of the DNA. These costs include, inter alia, wages for DNA members, office rent and office equipment costs. Hence, the amount of the fixed costs will depend on the number of persons that compose the DNA and the office and equipment cost. They will remain constant as long as the original DNA structure is not changed. These costs will likely be saved in the regional approval body option. Furthermore, variable costs will accrue during the DNA activities.

2.2.2. Variable costs

Additional costs will arise for the meetings needed to define sustainable development criteria and procedures for project approval, in other words, when special stakeholder forums are called. In addition, costs will accrue when DNA members make auditing trips to facilities. Likewise, travel costs of the DNA members to participate in climate change negotiations, conferences and different events related to their better operation will be incurred.
Moreover, it has been foreseen by the CDM Executive Board (EB) that through repetitive similar project procedures, transaction costs should be reduced. Understandably, this is verified only in regarding fees to be paid to the CDM EB. Nonetheless, the DNA needs to examine project conformity to approved methodologies. In effect, for strictly similar projects, some steps of the verification procedure should be avoided. Nevertheless this will not affect the overall variable costs to a significant degree.
Obviously the frequency of the meetings and DNA members' participation in regional and international events will increase the DNA's overall outlays. For these reasons, it is basically important to conceive this cost item as a cost saving DNA structure.

2.3. Structural possibilities of DNA

In the literature seven approaches of developing a DNA could be pointed out. These models will be analysed by the following section. In addition, the models which are suitable for avoiding conflicts and reducing costs at a regional approval body level are particularly highlighted and analysed.

2.3.1. Theoretical forms of DNA

2.3.1.1. UNFCCC focal point as DNA (A)

Since almost all countries have a UNFCCC focal point, the outcome of an option to address the DNA establishment difficulties in countries with limited CDM potential is that the focal point becomes the DNA. With the development of CDM activities, external consultants can be committed (Michaelowa 2003c). With respect to this option, there are no fixed costs as the focal point already exists, while the variable costs depend on the costs of the consultants compared to the government staff costs. Of course, the variable costs defined previously will be reduced with respect to costs of participating in the climate change negotiations, as these costs are supported by the UNFCCC Secretariat for focal point members from the developing countries.

2.3.1.2. Environmental Impact Assessment body as DNA (B)

The use of the environmental impact assessment (EIA) whereby one adds a GHG component to play the role of the DNA (Winkler et al., 2004) is a useful suggestion. This option will certainly help monitor project impacts after implementation, an aspect which is not covered by the CDM current rules. In this option, the fixed costs are saved, while the variable costs will depend on the staff characteristics and training needed.

2.3.1.3. FDI-Piggyback model (C)

This model is based on the fact that in most of the countries, a foreign direct investment (FDI) framework that promotes foreign investments exists. This framework comprises two separate offices - one for promotion and the other for project approval. This framework could be adapted to play simultaneously the role of the DNA UNEP 2004a, p.42). Given the specific aspects of the CDM, a relevant expert group should be formed by the investment office to deal with these issues. With respect to this option, the fixed costs could be saved, while the variable costs depend on the structure of the office that will play the DNA role and the skills needed.

2.3.1.4. Single government department model (D)

One department or ministry is responsible for all CDM activities and a unit within the ministry represents the DNA. The ministry may collaborate with other ministries and expert groups regarding specific issues[2].

[2] The model used in Chile, Dominican Republic, Honduras, Mexico, Ecuador, St Lucia, Trinidad &

2.3.1.5. A two-unit model (E)

In this model, one department is in charge of the regulatory function of the DNA, most probably a department dealing with sustainable development. It should evaluate projects and grant the host country approval. A different department is in charge of investment development, developing a portfolio of CDM projects for marketing to investors and organising capacity building[3] (UNEP, 2004a, p. 41).

2.3.1.6. Interdepartmental government model (F)

A committee built up from relevant governmental departments could be set up to approve projects[4].
Again, a problem of conflicting interests can arise here. Moreover, it will be difficult to identify the one making the decisions. Ministries will be fighting for this role for a long time, especially in the developing countries where any climate change related activity is viewed as a revenue-increasing opportunity. Hence, this DNA model will lead to high variable costs.

2.3.1.7. Outsourcing model (G): Shifting functions to NGOs

In this model, the DNA function is entrusted by the host country to a private agency, which is responsible for evaluating and validating the projects. That is the case in Costa Rica. The private agency reports to a government agency that plays the role of the DNA, approving projects. The host country's government will issue the final letter of approval.
If this model is a solution to avoid the non-consensus between ministries, it presents the advantage of low set-up costs, but it is costly for each CDM project (UNEP, 2004a, p. 42).

2.4. Empirical evaluation of existing DNAs structures: experience in LAC countries and implication for bundled DNA$_s$

With the exception of Brazil and Jamaica which have a DNA model similar to the interdepartmental government model, all other 17 DNAs have a structure similar to a single government department model where the DNA is a unit created within the ministry of environment and/ or natural resources.

Tobago could be assimilated to that model

[3] The Peruvian model should be assimilated to that model [4]

The Brazilian model should be assimilated to that model.

From the experience of the existing DNAs in the world, it appears that two structures dominate DNAs:
The first type is a two-tiered structure with a permanent secretariat based on limited personnel that deals with the DNA´s daily operational activities and a committee or office (with government representatives, private sector representatives and NGOs) that meet periodically to decide on rules and procedures to approve CDM projects.
The second type of structure is a single office with a combination of representatives from the public sector and others.
Since the costs faced by a DNA will depend on individual scenarios, we will discuss the two possible scenarios before addressing the issue of a suitable DNA structure.

2.5. Scenario 1: Large DNA with farreaching competencies

2.5.1. Tasks

In the discussion on the DNA structure, it has always been argued in the literature that a DNA could optionally be large and cover several activities. The argument for this proposal is that that it guarantees the functionality of the DNA by providing systematically support through a rigorous program and funding assistance, as well as necessary skills to personnel involved in the different stages of activities designed under this type of DNA. The following section addresses such a DNA model.

2.5.1.1. Development of national sustainability criteria

After a long discussion on sustainable development, the Marrakech Accords decided that each country should be responsible for the definition of its sustainable development criteria. National criteria development is one of the main tasks of the DNAs. Hence the countries should develop national criteria and respective information requirements to ensure a coherent, justifiable and transparent assessment in accordance with the national interpretation of sustainable development. Furthermore, a country's interpretation of the linkages between global mitigation efforts and its national development priorities, as well as its willingness to utilise the national potential in carbon offset opportunities, may be reflected in specific national policies and decisions related to the CDM.

2.5.1.2. Elaboration of guidelines for evaluation and approval of projects

In order to facilitate project presentation by project developers, the DNA can design a document format for the introduction on the national criteria. This document will serve as a guideline for project developers in the presentation of projects. Indeed it needs to be consistent and transparent so that project developers are not subjected to confusing and changing formats for the presentation of their projects.
Countries that need to attract CDM investment have to design quick and transparent procedures for screening, evaluating and approving projects. To reach these

objectives, the CDM office should implement a standardised system of screening, evaluating and approving CDM projects (Figueres et al., 2002a,b).

2.5.1.3. Capacity building, baseline additionality check and reporting

The DNA may check additionality if the CDM EB's interpretation of additionality is weak and is against the DNA needs to achieve financial additionality and technology transfers. Obviously, all these checks will increase transaction costs. A DNA should provide CDM capacity building in the following fields: 1) project identification formulation 2) baseline definition 3) quantification of emission reductions and 4) monitoring project performance[4].
Altogether, it is obvious that the function of a DNA is complex and varied. Making these skills available in the host countries naturally needs specific and additional capacity development. Therefore, additional investments are required.
An annual report on the CDM activity in the host country is the last part of the regulatory function of a DNA.

2.5.1.4. Transparency and Staffing

The evaluation process must be credible and transparent. This implies that rules for screening, evaluation and approval should be made known publicly in advance. Project proponents must have access to the rules and criteria in order to prepare their projects in accordance with the requirements. Moreover, all information used in the evaluation process must be documented and made available for review by projects proponents if required. In case of project rejection, the reason for rejection must be clearly made available so that the project proponents are able to reconsider them in accordance with the requirements. The issue of transparency is so important that in obvious absence of transparency, project proponents may withdraw from participation (Figueres et al. 2002).
The evaluation of CDM projects requires conventional desired capabilities as well as understanding of the technical requirements of carbon mitigation projects. Since these skills are not always available in the host countries, plus the fact that most of the time required funding for performing the DNA´s duty is lacking, staffing a DNA becomes a great challenge.
Obviously, processing the different operations discussed here increases transaction costs that a DNA is expected to bear.
Now, let us consider cost issues linked to this DNA Scenario.

2.5.2. Costs implications: Empirical Transaction costs

It is difficult to obtain access to information on the costs of the DNAs. Most of the time people consider such information as confidential. In this study, after long

[4] For more details see Figueres et al 2002a, pp. 70-72.

discussions with experts involved in DNA building and country representatives, it has been possible to obtain cost information concerning Benin and the WAEMU. Based on the information and a DNA model suggested in Indonesia (Michaelowa 2004a), an adaptation will be done here. The capacity building will involve 12 participants (statements from interviews conducted with DNA members). The number of participants is based on the results of the survey made by the author in the studied countries. In fact the government representatives are willing to have at least five ministries' representatives in the national authority's board and seven other stakeholders.

The cost estimation is based on cost items such as expenses regarding the operation of a board and a secretariat, running a capacity building program, organising stakeholders' forum and expert consultation and other administrative costs (Michaelowa et al, 2004a). The items retained in the DNA building are based on the DNA experience available in the literature and the fact that the members of DNAs under consideration supposedly manage capacity building program and stakeholder forums. Moreover, the item capacity building is composed of a local expert's fees and attendance fees for 12 stakeholders during 15 days. Attendance fees are US$ 35 per participant, wage for staff are US$ 800 per month for each of the secretary and methodology officers (survey in the studied countries).
As presented in table 4, the cost estimation reveals that fixed costs amount to around US$ 40,000 and variable costs equal around US$ 27,000. The fixed costs are slightly higher than the variable costs. This is mainly due to wages paid to the staff of the DNA. The variable costs level is explained by the events organised by the DNA. Around US$ 67,000 is required to conduct the DNA activities per year at country level.

Based on the understanding of the author of this study, small countries with low CDM potential who want to participate in the CDM process should opt for a model that provides CDM capacity building to the different stakeholders. In this way, people in developing countries will familiarise themselves with the CO_2 emission reduction activities and probably take these into consideration when they make decisions related to development issues. Another DAN scenario which merely approves CDM projects is possible as discussed in the following section.

2.6. Scenario 2: Minimum size DNA that just does rubber-stamp approval

Let us assume a government of a country has chosen this scenario. A very simplified DNA form such as a ministry could be envisaged to approve CDM projects as part of its current activities. Hence, this case concerns an entity that merely grants approval. In effect the CDM executive board is only interested in the notification from a country which confirms that the considered project contributes to the country's sustainable development. Since our focus here is not the TAC linked to

CDM project cycle but rather the DNA costs, it will be possible to argue that in this scenario, the host country will not bear any costs.
The following section analyses a way that the DNAs might be financed at least cost.

3. Results and analyses

3.1. Bundling DNA and the rationale of a WAEMU level approval body concept

It is obvious that since ten years of the climate change negotiations, only countries in Latin America[6] (LA), Asia[7], North Africa[8] and South Africa[9] have received CDM capacity building programs.

Due to their low CDM attractiveness climate, almost none of the countries of the WAEMU have received CDM capacity building[10] programme support. Moreover, in smaller countries such as Benin, Burkina Faso, Niger and Togo, the CDM potential is around 1 million tonne of CO_2 per annum in the energy sector with the best scenarios. Comparing these quantities individually with the other CDM suppliers from the LAC countries and Asia in their energy sectors, these quantities

6 The countries are: Brazil, Argentina, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Paraguay, Peru, St Lucia, Trinidad & Tobago, Uruguay; sponsored by the World Bank, CAF, UNEP, UNDP, USAID.

7 The countries are: India, Indonesia, China and all Southeast Asia (except Myanmar).

8 The countries are: Morocco, Tunisia, Algeria and Egypt.

9 Republic of South Africa, Zimbabwe and Tanzania.

10 Except Ivory Coast which is participating to Capacity Development for CDM (CD4CDM) of the UNEP. Ivory Coat is currently developing a CDM project pipeline, see: http://cd4cdm.org/countries%20and%20regions/subSaharan%20Africa/Third%20Regional%20Workshop/ProjectPipelineCoteDIvoire_Afferi.ppt. In addition, there have been some sporadic events on CDM in Niger and Burkina Faso, organised by UNIDO. See: http://www.unido.org/doc/42844.

are not significant enough to attract CDM investors who usually bear the CDM institution building costs. In addition, in most of the WAEMU member states there is almost no specific commitment to the CDM issues, to build awareness and to promote the CDM relevant activities. For these reasons, the CDM activity level in the region remains low.

Now let us discuss a theoretical design of the bundled DNA in the case of WAEMU before returning to the co-operation issue.

3.2. The West African Economic and Monetary Union

3.2.1. Organizational structure

The union has three organs, two specialised institutions, beneficiaries and enterprises.
Managing organ, composed of :
Conference of the Heads of States (CHS) and the Council of the Ministries (CM).
Control organ composed of a Court of Auditors, a justice court, an interparliamentary committee,
Advisory organ composed of regional consular chambers,
Autonomous specialised institutions, composed of the West African Central Bank (BCEAO), and the West African Development Bank (BOAD),
Actors and beneficiaries, composed of the member states and population plus enterprises[5].

The union has been built on the model of the European Union (EU). It has a commission that is a permanent organ composed of eight members, with one representative from each country. Its headquarters is located in Ouagadougou in Burkina Faso. The eight members meet to vote on the president and vice president. It executes the policy measures from the Council of the Ministries (CM) and suggests to the Conference of the Heads of State (CHS) and the CM policy measures that help achieve the goals of the Union. It also executes the budget of the union. It can seek the help of the justice courts when countries do not keep to their obligations.
The member states, the population and enterprises are considered as the beneficiaries of the programs of the union.
Additionally the Union has an expert committee of 16 members, with 2 from each country. They are called upon on the demand of the Council of Ministers (CM) through the commission. It is also possible that sector-based experts are used for specifics tasks[6].

Following the above short presentation of the union's structure, the subsequent section will analyse the institutions that will probably be involved in the regional DNA such as the commission of the WAEMU, and also propose a possible way to link a DNA to the existing structure of the union.

3.2.2. Analysis of working structure of the Commission of the WAEMU

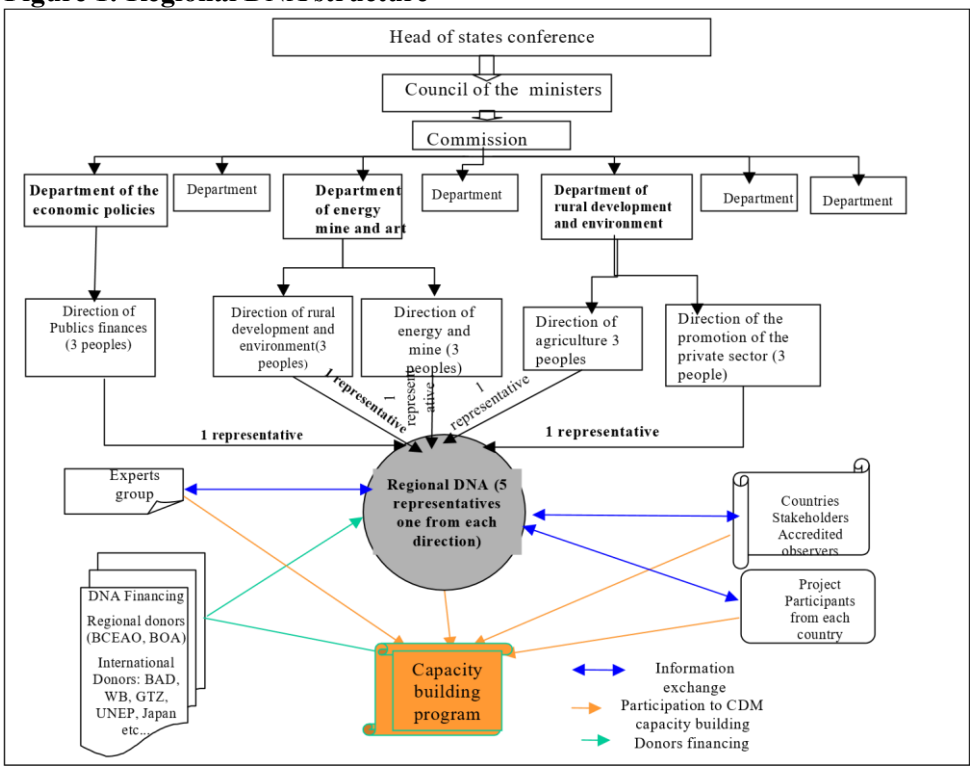
The commission exerts, for the correct operation and general interest of the union, authority delegated by the CM. It transmits to the conference and the council the recommendations and opinions that it judges useful for the preservation and the development of the union. Moreover, it executes the budget of the union and can seize the Court of Justice in the event of failure of a Member State to the obligations which fall to them under the terms of the Community legislation. In addition, it is the permanent organ of the Union, composed of eight departments. Since CDM activities are related to investment, energy generation and LULUCF and

[5] For more information, see: http://www.uemoa.int
[6] For more information, see: http://www.uemoa.int

development, the departments whose attributions cover the issues of the CDM should be taken into consideration, such as the department of Investment and International Co-operation (IIC), the department of Rural Development and Environment (RDE) and the department of Social Development, Energy, Mine, Industry and Tourism (SDEMIT). Each department is composed of a cabinet and three directions.
As for the SDEMIT department, there is a direction of energies and mines, a direction of industry, arts and tourism, and a direction of private sector promotion and competition.
About three permanent personnel work in each direction. For further analysis, the direction of investment and private sector promotion, environment, development, agriculture and energies will be taken into consideration as their attributions are in line with skills needed at the DNA.
After this short analysis of the working structure of the commission of the MAEMU, we will now discuss the issue of a regional approval body.
3.3 Regional approval body based on the WAEMU structures: the concept From the analysis of the structures of the WAEMU, the commission has a suitable structure that can be used to set up a RAB.
The RAB will approve CDM projects for each country and should inter alia administer the CDM capacity building program and the stakeholders' forums in the WAEMU countries.

The analysis revolves around three pillars:
First, a DNA set up is a pre-requisite to activities in all countries. Therefore, if the purchaser should bear the set-up costs, running costs and capacity building costs, he will finance eight times national DNA costs.
Second, by establishing one unique DNA for the union, the countries can be considered as a unique supplier of CERs. From this point of view, the CERs might be cheaper compared to the country level DNA option. This discussion is summarised in Figure 2 below.

Figure 1: Regional DNA structure



Source: own figure7.4 Rationale of the regional approval body concept

In the figure, the Y axis indicates total average costs and the X axis represents CERs quantities. It is assumed that transaction costs vary from country to country. Hence, let C1, C2, C3, C4 be the respective theoretical total average costs of earning CERs in each of the four countries of the study and C be the total average costs of the regional DNA for the four countries.

A represents economies of scale to the investor: as quantity increases, the cost of each unit decreases.

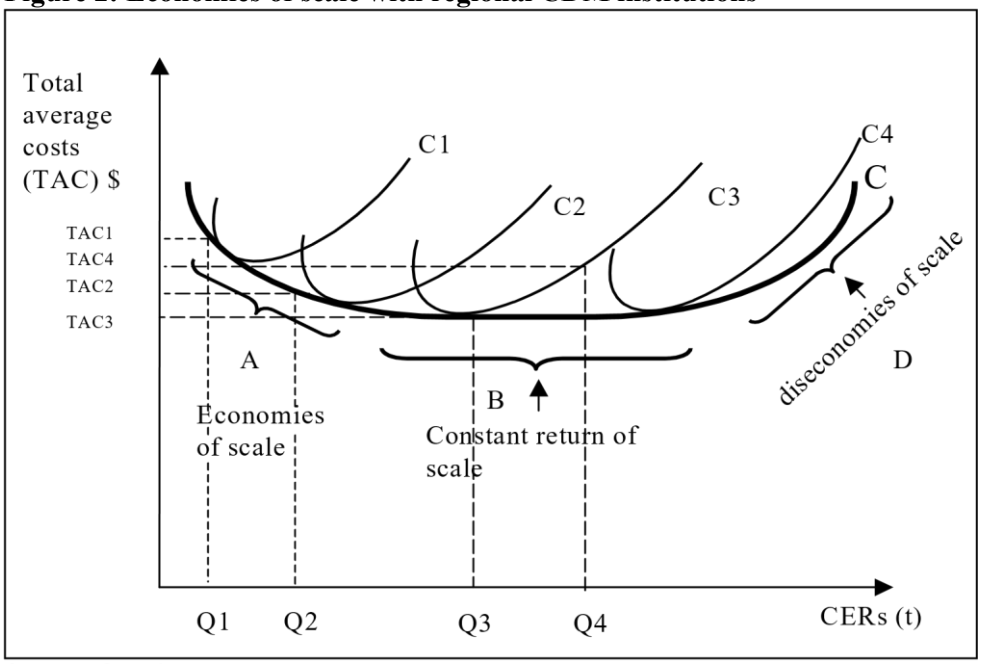
B corresponds to a constant return on scale: costs remain constant when quantity increases.

D stands for diseconomies of scale: increasing costs with increasing quantity generated.

Figure 2 reveals that due to the bundling of the DNA, in segment A, an investor earns increasing units of CERs (such that Q2 > Q1) at decreasing total average costs (TAC1 > TAC2), while in segment B, he earns additional CERs at constant total average costs.

Due to the slow development of economic activities and subsequently low CDM potential in the countries, the situation in C with increasing total average costs per additional CERs is unlikely to be reached

Figure 2: Economies of scale with regional CDM institutions



Source: Own figures

Hence, an investor will earn CERs in the segments A and B. These might prove attractive to investors. Therefore, a bundling or a regional approval body offers a least-cost option to finance CDM institutions with cheaper CERs in a region provided with small countries and lower CDM potential.

Third the UEMOA personnel are mostly permanent and not directly influenced by their respective governments. Thus, they could perform their work freely, objectively and guarantee at the same time continuity in the follow-up and development of the CDM activities. Thus, for this reason, it makes sense from the society's point of view to have a centralised approval body.

The possible feature of the regional approval body is analysed in the following section.

3.3. Desired features of the regional approval body for WAEMU membership

In order to attract WAEMU membership, the DNA should have a simple and transparent decision making structure, as well as a simple and clear procedure to give regional approval to projects in the fastest way possible. Moreover, the approval should be delivered efficiently, with high quality work and low cost administration that deals with GHG emissions projects with sustainable development requirements. Furthermore, it should identify risks and make suggestions to overcome them. It should be able to propose a list of regional criteria that safeguards regional integrity

but which is not prohibitive for project developers. The focus should be to position the region as a source of good projects with an effective institutional arrangement for approval (UNEP 2004a).
In addition, the DNA should identify in advance the experts with specific skills to deal with specific requirements of CDM projects, such as GHG mitigation and carbon revenue. It will establish a simple and clear regional project cycle for approving CDM projects. Based on the features described here, the research calls the so established DNA, "optimal DNA".
In the future, with project development, an option should be to raise a percentage of the CER revenue to finance the DNA. However, such an option will weaken the countries' competitiveness in the international CDM market.
After discussing the general features of the regional approval body, let us analyse its structure based on the experiences gained in the LAC cases. The first structure is called ideal structure and the second is called second best.

3.4. Structure of regional approval body: all competence at WAEMU

With respect to this structure, the RAB is composed of a permanent secretariat of five people specialised in CDM issues. The so composed RAB will proceed with all the approval tasks and send the approval letters to the CDM Executive Board. Of course, the host countries are also informed on the projects that have been approved. Obviously, this structure is easy to manage, as the whole approval process is entrusted to one organ or structure. However, oppositions to this RAB option may appear as government representatives are eager to participate in the CDM process, for different reasons such as a country's sovereignty and own interests.

3.5. Cost implications

The cost assessment of the regional DNA is based on cost items as shown in table 4 below.
The board is composed of 5 members, from which a permanent secretariat of 3 personnel is derived. They meet statutorily twice a year. Additional meetings are conducted for project assessment. For the purpose of the calculations we assumed that two projects are submitted per year.
The capacity building involved 96 participants, 12 from each country. The number of participants involved is based on the discussion made previoslly.
In addition, a stakeholder forum is organised to define and agree on sustainable development in each country. The item travel costs is accrued here as it has been assumed that it will not be efficient to organise capacity building to 96 participants in one room. Hence, the research suggests that the participants be split up into two groups of 48 participants each. The capacity building will be organised in two different countries. Hence, 74 participants plus the 5 regional DNA members will travel to the two capacity building places.

Furthermore, the expert group will be invited by the regional DNA when specific tasks are requested. Their role will be to assess specific aspects of a project. They should be paid at the outset of DNA budget.

The remuneration and the travel costs used for the calculation are based on information from the WAEMU commission (result of interview). Overall costs to the DNA are around US$ 154,000. An analysis of the costs reveals that travel costs charged to the DNA are costs for capacity building and stakeholder forums. Due to the higher number of participant at the meetings, a large share of the costs of running the DNA is variable. These variable costs will be incurred for meetings, when experts advice is needed, and when stakeholder forums are organised. Total variable costs are estimated at about US$ 98.000 per year, while the fixed costs are around US$ 59,000. Obviously, the option presented here does not involve host countries in the approval procedure.

3.6. Cost saving of the regional Approval Body

In this section, the saving made based on the RAB option as well as the implication to the generated CERs in the region will be analysed.

The total annual costs of running the retained RAB is about US$ 157,000. But taking into consideration the fact that this concerns eight countries, it becomes interesting to make a short analysis.

Practically, it could be shown in table 6 below that a regional CDM institution really offers cheaper CERs.In the table, option I represents a country level of the DNA scenario, option II indicates a RAB scenario and option III represents the scenario in which at the end, eight times support is provided to the CDM institutions' building and operation.

Table: CER costs comparison between national and regional options

	CDM potential (Million Ton CO_2-eq)*	Fixed costs (US$)	Variable costs (US$)	Total costs (US$)	Cost/t CO_2 ($ c)	CER revenue (M US$)
Option I	1	40,000	27,000	67,000	7	10
Option II	8	59,000	98,000	157,000	2	80
Option III = 8X option I	8	320,000	216,000	536,000	7	80

Source: own figures based on the two costs scenarios suggested. It is assumed that each country has a potential of 1 million tonnes of CO_2-eq; 1 CER = 1 tonne CO_2-eq.; CERs price: US$ 9; CER are 70% cheaper in option II compared with option III.

Obviously, the total costs under option II is lower than that under option III (157,000 < 536,000). Moreover, options II and III have the same CERs revenues (US$ 80

million), but option II offers a lower-cost CERs ($c 2/t) than option III ($c 7/t), which is around 70% cheaper.

If each country is supposed to set up its DNA, then DNAs for the eight countries together will cost about US$ 536,000. This is around 70% higher than in the case if they were to have a joint DNA, which will cost about US$ 157,000. Thus, option II represents a least-cost option.
All together, both parties (investors and host countries) that agree on creating a bundled DNA will stand to gain. This is because host countries will enjoy a capacity built-up they will otherwise not receive and cheaper CERs are sold. Hence, the RAB represents have a cheaper option to provide capacity building and generate CERs in the region.

4. Conclusion

From what has been discussed so far, the DNA's operation is linked to important tasks which require specific skills. Hence, capacity building is crucial to guarantee a proper operation of the DNA. Nonetheless, a proper capacity building programme as shown in the Moroccan case has until now not taken place.

Furthermore, the analysis of the existing DNA structures reveals that the two-tiered structure is cost efficient compared to the single office. Hence, the two-tiered structure with a permanent secretariat based on limited personnel that deal with current activities of the DNA and a committee or office that meets to decide on rules for CDM projects is retained in the regional approval body's context. In fact, the permanent secretariat will deal with the DNA operation and approve CDM projects, while initially each country of the WAEMU will define sustainability criteria by decision of a committee on the national level. This model has the advantage that first, stakeholders will have the opportunity to be involved in the capacity building programme, which they probably would not have otherwise. Second, local stakeholders have the possibility of participating actively in the CDM process.
In addition, the RAB is economically defensible, as a least-cost regional capacity building programme can be provided to the countries and relative cost efficient CERs can be issued to the CDM investors involved. In sum, the RAB represents the social optimum which will maximise social welfare. Still, it is likely that the concerned countries might not opt for this economically efficient option. In effect, very often the interests of different stakeholders involved in the process could motivate the choice of an option different from what the common sense judges to be economically efficient. This is the notion of political efficiency.

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