Wissenschaftszentrum
Nordrhein-Westfalen
Institut Arbeit
und Technik

Kulturwissenschaftliches
Institut
Wuppertal Institut für
Klima, Umwelt, Energie
GmbH

Christiane Beuermann
Thomas Langrock
Dr. Hermann E. Ott

with contributions from
Bernd Brouns and Hauke von Seht

Evaluation of (non-sink) AIJ-Projects in Developing Countries (Endadec)

on behalf of the
Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH

Wuppertal Papers

No. 100 · January 2000
ISSN 0949-5266

NRW.

"Wuppertal Papers" do not necessarily represent the opinion of the Wuppertal Institute. They are provided to a limited number of experts so that they can learn about the ongoing work at a relatively early stage. Even though the content has normally been discussed within the Wuppertal Institute prior to being issued in the form of a "Wuppertal Paper", the authors consider their work still to be of a certain preliminary nature. For this reason, all recipients of "Wuppertal Papers" are very much invited to comment and enrich the work presented here.

Slight deviations between the printed version and the PDF version are possible. For example, blank pages have been omitted in this PDF document. Therefore, if you are quoting from the PDF version, we suggest that you indicate this in brackets: "PDF version".

Wuppertal Institute for Climate, Environment and Energy
Climate Policy Division
Christiane Beuermann
Thomas Langrock
Dr. Hermann E. Ott
Döppersberg 19

42103 Wuppertal
GERMANY

Phone: 0202-2492-129
Fax: 0202-2492-250
E-Mail: thomas.langrock@wupperinst.org
E-Mail: christiane.beuermann@wupperinst.org
http://www.wupperinst.org

on behalf of the
Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH

Contract No. 81026894
Project No. 93.2058.1-031.90

Contents Page

Foreword

Since the beginning of this year, the Clean Development Mechanism (CDM) of the Kyoto Protocol can be used to support developing countries in achieving sustainable development and to assist Annex 1 Parties in achieving compliance with their quantified emission limitation and reduction commitments under the Protocol. However, the Protocol has not yet entered into force, and detailed rules and guidelines for the CDM are still subject to agreement. Thus many investors, notably in Germany, hesitate to commit themselves to CDM projects. The aim of the German government is that the Kyoto Protocol enter into force in the year 2002. It is essential that CDM rules are agreed swiftly, in order that investors cast aside their hesitance and developing countries profit as soon as possible from CDM projects in their sustainable development processes. It remains to be seen whether agreement can already be forged at the upcoming COP 6. At all events, the debate on rules and guidelines is in full swing.

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH - German Technical Cooperation - is an active participant in this debate. Since 1993, acting on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), GTZ has supported developing countries in implementing the UN FCCC. GTZ's inputs to the debate are a result of the experience gained in the programme on “Measures to Implement the UN FCCC”, which to date has involved some 25 projects in 20 developing countries.

Activities Implemented Jointly (AIJ) provide a further important source of experience upon which to build rules and guidelines for the CDM. GTZ itself has not been involved in the design and implementation of AIJ projects. Moreover, German investors have only very limited experience with AIJ projects in developing countries. This is why GTZ – in consultation with BMZ – decided to evaluate AIJ projects in developing countries with respect to how the experience gained in these projects can be utilized in developing rules and guidelines for the CDM.

The present report summarizes the findings of the evaluations. The study was limited to non-forestry AIJ projects, as the German government interprets Article 12 of the Kyoto Protocol as excluding carbon-sink projects from the CDM.

The Wuppertal Institute for Climate, Environment and Energy conducted this study with great commitment on behalf of GTZ. The findings of the study, for which only very limited funding was available, place in stark relief the need for the CDM to have much clearer rules than those applied to the AIJ pilot phase. If reliable implementation of the Kyoto Protocol is to be safeguarded, the wide leeway for interpretation of AIJ project agreements and of the uniform reporting format revealed by this study will scarcely be acceptable within the framework of CDM. By presenting this report, we hope to assist the CDM in achieving its goals.

Holger Liptow
GTZ, Department 44

January 2000

Executive Summary

Background and objectives

How can an efficient CDM be designed? Clearly, only mutually agreed and transparent rules will make it a successful tool in international climate policy. As long as such rules are not established, investors will not commit to CDM projects. Furthermore, the consideration of the specific contexts and needs of developing countries (DCs) is decisive for project development and implementation. Therefore, an assessment of the practical experiences with AIJ projects in DCs is a challenging and urgent task. For this reason, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, acting on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), asked the Wuppertal Institute to undertake a preliminary evaluation of AIJ projects in DCs as part of its climate change programme. The assessment particularly aims at

- developing assessment criteria for AIJ projects,
- applying these criteria to non-sink related AIJ projects considering the specific conditions of developing countries, and
- utilising the observations made with regard to AIJ to contribute to the design of the CDM.

Project scope

Of the 108 AIJ projects approved in June 1999 only twenty non-sink AIJ projects are implemented in developing countries. These cover four types of projects: energy efficiency, renewable energy, fuel switching and fugitive gas capture. Sink related projects have not been dealt with in this study since Germany does not regard them as eligible under the Kyoto Protocol.

Evaluation framework

The assessment was based on two sets of criteria: official criteria from the AIJ pilot phase and performance criteria. Both sets of criteria translate into a number of methodological and procedural questions that have been subject to extensive research, discussion, and negotiations. Due to constraints of resources and time, however, the Ensadec project could not cover all of these issues comprehensively. Two major issues were thus chosen from the set of key methodological issues: environmental additionality of the project and contribution to sustainable development.

Assessment procedure

The projects were assessed in four steps: First, the analysis involved literature submitted to official entities by the project partners, particularly the Uniform Reporting Formats (URFs). In a second step, information obtained from responses to a questionnaire provided additional insights. Third, visits to selected projects proved to be an indispensable source of information and experience (Bio-Gen Biomass Power Generation, Solar Based Rural Electrification, Methane Emission Reduction, and Aeroenergia Wind Facility). Finally, complementary literature helped to fill partially the gap in project coverage. The approach was generally limited to a qualitative assessment and did not intend to quantify overall project performance or to rank projects.

Observations

It is important to note that the current performance and state of implementation of the projects could hardly be assessed on the basis of official project information. Without the questionnaire, talks and visits on site, the analysis would have yielded completely different results. It appears that only eleven projects out of the project sample are at least partially operational. Of these, just two have done monitoring and verification. As a general rule, major deviations of the project reality from what is outlined in the URF should be expected. A division of tasks between the project developers in the host and in the investor country was observed. Investor country representatives appear to dominate the AIJ project components.

The environmental additionality of AIJ projects is difficult to determine, as the majority of the projects have been developed for other purposes, for example, in a development context. Usually, the time necessary for project development and the absence of incentives in the AIJ pilot phase resulted in quasi simulations of AIJ, taking projects from other programs or simply adding AIJ components to the projects.

The sustainability of the projects cannot be fully assessed. Of the three dimensions of sustainability (environmental, social, and economic), only environmental impacts have been considered in some depth by project developers. The returned questionnaires revealed the difficulties to grasp a project's reality with a standardised set of sustainability indicators. Due to the URF's lack of more specific questions on participation, neither the quality nor the different kinds of participation are clear. Participation of NGOs, research institutes or others was rarely reported but might have taken place.

Recommendations

There is a strong interdependence between the concrete operationalisation of the CDM criteria and the reporting. A continuos improvement of the reporting system will have to go parallel with the evolvement of the institutional and legal framework. Whereas the URF is the only reporting format under the AIJ pilot phase, reporting under the CDM will have to differentiate according to the purpose of the compiled information, for example as regards the degree of completeness. Parties, therefore, should negotiate new reporting formats and their different qualities rather than concentrating exclusively on the further development of the URF.

Environmental additionality

As a result of the „try-and-error-approach" used in the AIJ pilot phase, a standardised methodology is missing: rather similar projects employed quite different approaches. A standardisation of a large number of project types does not appear feasible. In the early stages of the CDM, more experimenting with different methodologies appears desirable. Minimum rules, however, must guarantee environmental effectiveness and should help to reduce the risk for project developers.

1. The terminology used and the approach „environmental additionality" as such should be clarified. Justification of the reference case, project additionality, and measurement of GHG emission reductions should be seen as independent components of environmental additionality. A common terminology is a precondition for standardisation. Generally,

practical experiences should be better explored and utilised. An improvement of the information exchange between official entities and the project developers on site would be advisable.

2. The respective reference case must be formulated and justified. As a preparatory exercise, a more comprehensive assessment and development of possible approaches for the reference case or baseline determination is necessary. Therefore, a project by project approach appears to be appropriate at present. However, the reference case chosen by the project developers should fulfil certain minimum requirements. Such requirements should at least provide that the reference case must not violate legal provisions of the host country, for example concerning existing environmental standards.

3. Reference cases should be categorised whether they consist in the „continuation of a prevailing scenario" or whether they constitute a „new investment option" - also called a greenfield situation. Minimum requirements must be defined according to these categories.

4. The reference case justification has to answer the question „Why would the reference case happen?". Project developers should be required to substantiate their claims on the reference case, for example, by showing that its operation is economically sensible for the stated time.

5. The barrier approach might help to assess environmental additionality. At least four categories of barriers should be distinguished: i) technological, ii) knowledge related, iii) cultural, and iv) institutional barriers. Specific project barriers and options for how to tackle them should be identified.

6. A simplified approach to decide on the environmental additionality of CDM cases might consist in the development and adoption of positive lists. CDM cases included on this list would automatically be considered additional. As a precondition for adding project types to these lists, a general but country specific sustainability test should be passed. A positive list might include several project types dealing with renewable energy. In contrast, high-risk technologies, e.g. nuclear, would not be included. However, before any decision on the adoption of positive lists is taken, Parties should carefully consider the pros and cons of allowing for such easier decision-making processes, e.g. during the validation of CDM projects.

Contribution to sustainable development

Discussions on this issue are still heated, therefore the requirements concerning contribution to sustainable development should be tightened gradually in a step-by-step procedure.

1. An obligatory and quantitative pre-assessment of sustainability indicators does not appear to be feasible at present. Weighting and aggregating values for sustainability indicators in order to obtain a single marker signifying a positive or negative contribution of the respective project to sustainable development appears too complex as a criterion for validation. Nevertheless, Parties might further discuss if such an approach can be useful as a complementary means to assess the project impact and success.

2. Generally, project planning and implementation could follow established guidelines used in development policy. Parties should explore in how far guidelines already existing within the OECD can be employed.

3. Particularly regarding participation, Parties may consider existing experience in development policy for participation process requirements. Stakeholder involvement should in any case be designed for the specific project and country circumstances, for example, as regards the important and affected stakeholders, and as regards established patterns of representation.

4. It might be a sensible strategy to differentiate projects according to the amount of emission reductions they generate annually. Stronger sustainability requirements, like the requirement to carry out a full environmental impact assessment, could be applied if the amount of generated CERs per annum exceeds a certain limit, for example 10,000 t carbon dioxide equivalent p.a.

Capacity building

1 The performance of AIJ projects evaluated depended particularly on the AIJ specific host country capacity. In general, the AIJ information base appeared to be concentrated on the investor country authorities involved. A general CDM capacity building program tailored to the specific needs of potential host country project representatives should be linked with the CDM projects as a prime project element.

2. Potential host countries should already at this stage of the Kyoto-Mechanisms make full use of CDM capacity building programs and projects offered by bi- and multilateral organisations. For example, the GTZ in co-operation with the World Bank provides assistance under the National Strategies Studies (NSS) Programme. Among other objectives, the NSS aims to define options and devise strategies for a country to best benefit from the CDM.

3. The existing host country capacities should be utilised wherever possible, for example for the preparation of studies, reports, etc. The stronger involvement of local or national capacities would also lower transaction cost of the projects and contribute to the sustainable development in the host country.

1 Background and Objectives[1]

The Clean Development Mechanism (CDM) as laid down in Art 12 Kyoto Protocol is one of the four flexibility mechanisms included in the Kyoto Protocol:

- Provision for joint fulfilment (Art. 4),
- Joint Implementation among Annex I-countries (Art. 6),
- Clean Development Mechanism among Annex-I and Non-Annex I countries (Art.12), and
- Emissions Trading (Art. 17).

How can an efficient CDM be designed? Clearly, only mutually agreed and transparent rules will make it a successful tool in international climate policy. As long as such rules are not established, investors will not commit to CDM projects.

The consideration of specific contexts of developing countries (DCs) is decisive for project development and implementation. Therefore, an assessment of the practical experiences with AIJ projects in DCs is a challenging and urgent task. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH acting on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) actively pushed the Ensadec project already from the first conceptual ideas as part of its climate change programme.

With the Ensadec project an attempt has been made to better understand which are the success factors for the development, implementation and administration of future CDM-projects. It relies on the experience of handling the only economic instrument yet in place in the climate regime: the AIJ pilot phase established by the first Conference of the Parties (COP) to the Framework Convention on Climate Change (FCCC) in Berlin in 1995. The decision to focus on AIJ pilot projects in developing countries was taken in the light of two recent developments:

- The AIJ pilot phase was limited until the end of the decade. The Subsidiary Bodies, therefore, prepared an assessment of the AIJ pilot phase (FCCC/SB/1999/5, Corr.1 and Add.1).[2]
- The adoption of the Kyoto Protocol by the third COP in 1997 in Japan increased the necessity for such an evaluation. Crediting greenhouse gas emission reductions under the CDM might start as early as 2000. Hence, an evaluation of the AIJ pilot phase projects in developing countries proved an urgent task.

The assessment of non-sink related AIJ projects in developing countries aims at

- developing assessment criteria for AIJ projects,
- applying these criteria to non-sink related AIJ projects considering the specific frameworks of developing countries, and
- utilising the observations made with regard to AIJ to contribute to the design of the CDM.

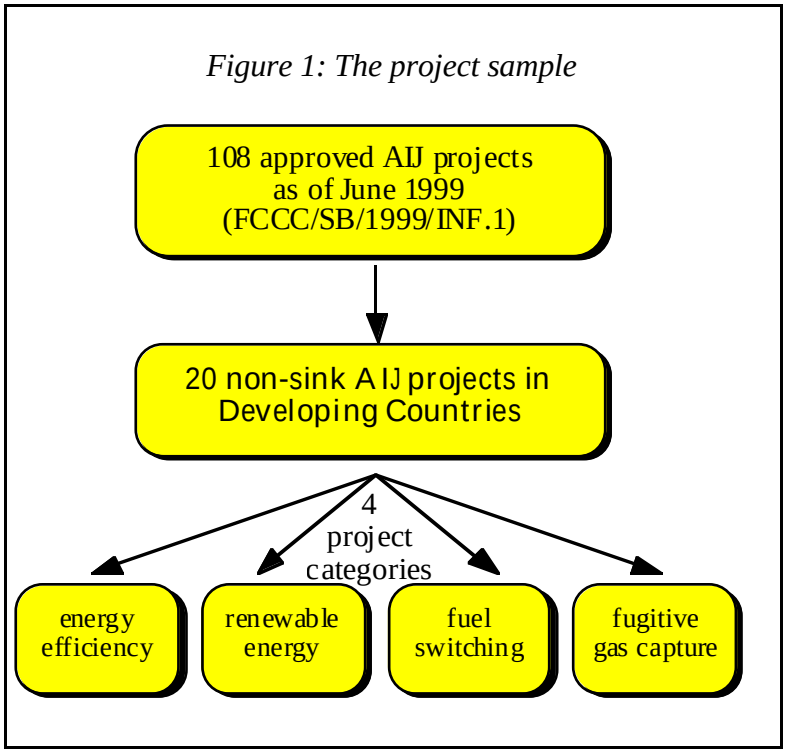
[1] **ACKNOWLEDGMENTS:**
The authors wish to express their gratitude to all the people that have contributed to ENSADEC. Particularly, we are indebted to those who returned the questionnaire, who send us literature and all those who spend some time with us discussing the difficulties of AIJ. The ENSADEC project would not be what it is now if there had not been such a strong support from Honduras and Costa Rica. Therefore, our warmest thanks go to our contact persons in Tegucigalpa and San José. As always, however, responsibility remains with the authors.

[2] During COP5 in 1999, it was agreed to extend the AIJ pilot phase (Dec.13/CP.5).

2 The Project Scope

The Secretariat of the FCCC included 108 approved AIJ projects in the updated AIJ-project list as of June 1999 (FCCC/SB/1999/INF.1). The majority of these projects has been developed by and implemented in Annex I-countries. In contrast, there are only twenty non-sink AIJ projects in developing countries on this list which consequently constitute the sample under observation in this project (figure 1). Four types of projects are covered: energy efficiency, renewable energy, fuel switching and fugitive gas capture.

Figure 1: The project sample



This selection also excludes all projects in the areas of afforestation, agriculture, forest preservation, and forest reforestation. The reasoning behind is that the eligibility of sink and land use related projects for CDM is highly questionable (Grubb 1999: 135, Oberthür and Ott 1999: 178). Methodological issues related to such projects appear very complicated. Decision-makers expect further clarification from the 2000 special report of the IPCC that will focus on land use and forests.

The majority of projects looked at in this assessment falls into the categories energy efficiency and renewable energy. From a regional perspective, most projects are located in Latin America followed by the Asian Pacific region. Only one project is implemented in Africa. Table 1 provides an overview of the project sample.

Table 1: List of non-sink related AIJ projects covered in this project.

No.	Activity type	Activity title	Parties (H/I)
1	Energy efficiency	Air conditioner Energy Conservation Programme for the Solomon Islands	Solomon Islands/Australia
2	Energy efficiency	Burkina Faso Sustainable Energy Management	Burkina Faso / Norway
3	Energy efficiency	COGAS/ANELEC	Bolivia/Netherlands
4	Energy efficiency	High Efficiency Lighting (ILUMEX)	Mexico/Norway
5	Energy efficiency	Installation of Coke Dry-Quenching Facility	China/Japan
6	Energy efficiency	Integrated Agriculture Demand Side Management AIJ Pilot Project	India/Norway
7	Energy efficiency	Introduction of High Efficiency Illumination in the Residential Sector	Honduras/ Netherlands
8	Fuel switching	Rural Electrification in the San Ramon Area	Bolivia/Netherlands
9	Fugitive Gas Capture	Methane Emission Reduction at the Wastewater Treatment Plant in Coffee Mills	Costa Rica/Netherlands
10	Renewable Energy	Aeroenergia S.A. Wind Facility	Costa Rica /USA
11	Renewable Energy	APS/CFE Renewable Energy Mini-Grid Project	Mexico/USA
12	Renewable Energy	Bio-Gen Biomass Power Generation Project Phase II	Honduras/USA
13	Renewable Energy	Dona Julia Hydroelectric Project	Costa Rica /USA
14	Renewable Energy	El Hoyo-Monte Galan Geothermal Project	Nicaragua/USA
15	Renewable Energy	Grid-Connected Photovoltaic Project	Fiji/Australia
16	Renewable Energy	Kilung-Chuu Micro Hydel Bhutan	Bhutan/Netherlands
17	Renewable Energy	Plantas Eolicas S.A. Wind Facility	Costa Rica /USA
18	Renewable Energy	SELCO - Sri Lanka Rural Electrification	Sri Lanka/USA
19	Renewable Energy	Solar-Based Rural Electrification in Honduras	Honduras /USA
20	Renewable Energy	Tierras Morenas Windfarm Project	Costa Rica/USA

3 The Framework for the Evaluation of Non-sink AIJ Pilot Projects

Following the logic of the AIJ pilot phase the Ensadec project endeavoured an absolute assessment of the projects in question, i.e. to check the fulfilment of the AIJ criteria. These criteria need to be interpreted. Therefore, the preceding section starts with the official AIJ criteria and contrasts them with the CDM criteria. Performance indicators are a second set of criteria that is useful to cross-compare the projects. The reasoning behind this relative evaluation is elaborated in section 3.2.

3.1 The AIJ criteria

The discussion on appropriate criteria for AIJ projects has gone on from the beginning of the negotiations of joint implementation (in Germany, e.g., Loske and Oberthür 1994, Luhmann et. al. 1997). In 1995, the first COP in Berlin decided upon fundamental criteria (Dec.5/CP.1) for project selection, approval and assessment - the AIJ pilot phase commenced. Moreover, these criteria form the basis for the flexibility mechanisms laid down in the Kyoto Protocol. Regarding the CDM, wording similar to Dec.5/CP.1 and some supplementary criteria have been incorporated in Art. 12 Kyoto Protocol:

"The Conference of the Parties (...) 1. Decides:	*Clean Development Mechanism (Article 12 Kyoto Protocol):*
(a) To establish a pilot phase for activities implemented jointly among Annex I Parties and, on a voluntary basis, with non-Annex I Parties that so request;	*Art 12 (2):The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, (...),*
(b) That activities implemented jointly should be compatible with and supportive of national environment and development priorities and strategies, contribute to cost-effectiveness in achieving global benefits and could be conducted in a comprehensive manner covering all relevant sources, sinks and reservoirs of greenhouse gases;	*Art 12 (3): Under the Clean Development Mechanism:*
(c) That all activities implemented jointly under this pilot phase require prior acceptance, approval or endorsement by the Governments of the Parties participating in these activities	*(a) Parties not included in Annex I will benefit from project activities resulting in certified emission reductions; and Renewable Energy*
(d) That activities implemented jointly should bring about real, measurable and long-term environmental benefits related to the mitigation of climate change that would not have occurred in the absence of such activities;	*(b) Parties included in Annex I may use the certified emission reductions accruing from such project activities to contribute to compliance with part of the quantified emission limitation and reduction commitments under Art 3, (...),*
(e) That the financing of activities implemented jointly shall be additional to the financial obligations of Parties included in Annex II to the Convention within the framework of the financial	*Art 12 (4)The Clean Development Mechanism shall be (...) supervised by an executive board (...),*
	Art 12 (5):Emission reductions (...) shall be certified by operational entities to be designated by the Conference of the Parties (...), on the basis of
	(a) voluntary participation approved by each Party involved,
	(b) Real, measurable and long-term benefits

	mechanism as well as to current official development assistance (ODA) flows;		*related to the mitigation of climate change; and*
(f)	*That no credits shall accrue to any Party as a result of greenhouse gas emissions reduced or sequestered during the pilot phase from activities implemented jointly; (...)" (Dec.5/CP.1)*	*(c)*	*Reductions in emissions that are additional to any that would occur in the absence of the certified project activity. (…)*
		Art 12	*(7)The Conference of the Parties (…) shall, at its first session, elaborate modalities and procedures with the objective of ensuring transparency, efficiency, and accountability through independent auditing and verification of project activities.*

Both sets of criteria translate into a number of methodological and procedural questions that have been subject to extensive research, discussion, and negotiations. However, the Ensadec project could not cover all of these issues comprehensively. Out of the set of key methodological issues

- environmental additionality of the project, and
- contribution to sustainable development

were chosen, whereas the institutional framework, for example, could not be tackled.

3.1.1 Environmental additionality of the project

Environmental additionality is commonly referred to among negotiating Parties as the determination of *„Real, measurable and long-term benefits related to the mitigation of climate change"* (Art. 12 (5) b) *„(...) that are additional to any that would occur (...)„* (Art 12 (5) c) (e.g. Baumert 1998: 7, FCCC/SB/1999/Misc.3.Add.3: 11). It, therefore, signifies a vast area of problems that were subject to extensive discussion. Still, there are numerous interpretations of environmental additionality. For example, the United States Initiative on Joint Implementation (USIJI) distinguishes between two components of environmental additionality (Dixon 1999: 14): emissions additionality, and program additionality.

In order to meet emissions additionality, project developers must demonstrate that the emissions stemming from the AIJ project are lower than those in the "baseline scenario", also called „reference case". Program additionality, in contrast, demands that the AIJ project developers shall demonstrate that their project was initiated in response to USIJI.

Regarding the international negotiation process, the Subsidiary Body for Scientific and Technological Advice (SBSTA) summarised that environmental additionality shall be the demonstration that the resulting environmental benefits related to greenhouse gases (GHG) would not have occurred otherwise (SBSTA 1997: 5 compare also Carter 1997). SBSTA mentions several methods that are currently being used:

- measuring additionality of an AIJ project against a credible, quantitative baseline,
- defining narrow categories of activity types whose emission benefits will a priori be considered additional; and

- assessing additionality by evaluating whether an AIJ project overcame financial, institutional, technological, or other barriers to project development.

In short, common guidelines did not exist during the AIJ pilot phase. Searching through the literature reveals that despite long and extensive theoretic-conceptional discussions, a number of methodological problems still have to be solved and made applicable, such as:

- What is a concise and complete formulation of the reference case and the AIJ case[3]?
- How can the occurrence of the reference case in the absence of the AIJ case be justified?
- How can the total GHG impact of an AIJ project sensibly be disaggregated?
- How can the emissions of the reference case and the AIJ case transparently be measured in order to determine real, measurable and long-term benefits related to the mitigation of climate change.

The general consensus, therefore, appears to be that environmental additionality of each AIJ project consists of three components:

- reference case formulation and justification,
- AIJ case formulation and justification,
- determination of GHG offsets.

The AIJ case and the reference case are two mutually exclusive investment options. It is assumed that the reference case would happen if there was no extra incentive that made the project developer implement the AIJ case. The greenhouse gas offset is the difference in GHG emissions between the AIJ case and the reference case (e.g. Michaelowa 1999, Michaelowa and Fages 1999, Jepma et al. 1999).

3.1.2 The contribution to sustainable development in the host country

Whereas the AIJ pilot phase did not explicitly focus on the contribution of projects to the sustainable development of potential host countries, this is an explicit objective of the CDM. At COP1 Parties agreed that AIJ projects shall be ”compatible with and supportive of national environment and development priorities and strategies”. This is a reasonable request, because effectiveness and long-term acceptance of AIJ projects declines if they do not fit into these priorities and strategies. Furthermore, the latter evolve - at least in most cases - in a democratic process. The acceptance of democratic decision-making is among the preconditions for achieving smooth long-term sustainable development (Agenda 21, 1992). These demands were reflected by several sections of the guidelines for project communications: parties were asked to describe in how far the activity is compatible and supportive of national economic development and socio-economic and environment priorities and strategies.

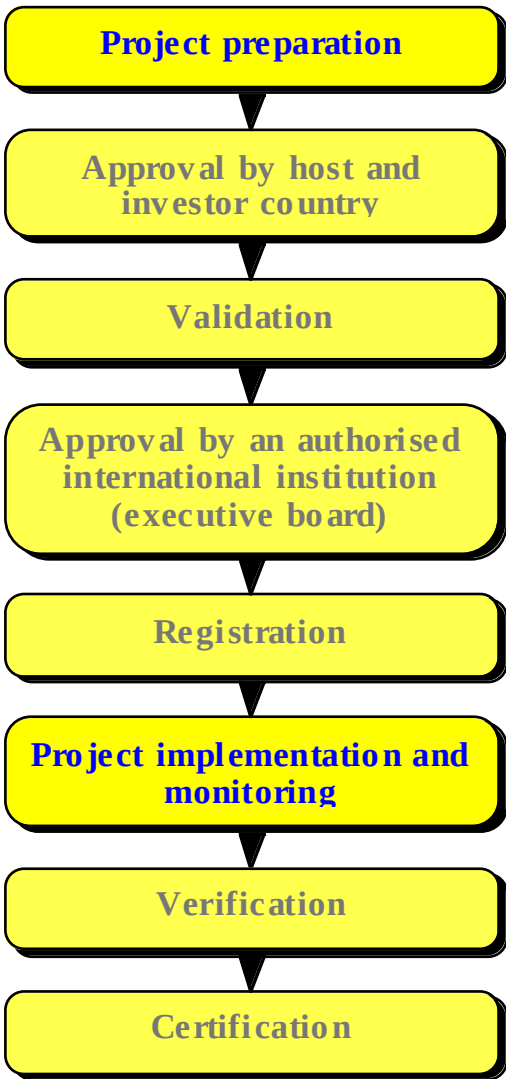
Applicable guidelines for how to deal with sustainable development at the project level have so far not been developed and adopted. Yet, it is commonly agreed that there shall be a

[3] An „AIJ project“ in this assessment is defined as having two components: the „reference case“ and the „AIJ case“.

three dimensional sustainability criterion: social, environmental, and economic impacts are of utmost importance and shall be taken into account during planning and implementation.

3.2 Performance criteria to assess the project operation

Figure 2: Project phases



In addition to the original methodological issues, however, a number of operational considerations has to be taken into account when developing recommendations for the design of the CDM. These may be classified as performance indicators for the ongoing pilot projects in order to utilise the project specific implementation experience in developing countries. Issues to be considered are, for example:

- transaction costs,
- uncertainties,
- project risks,
- transparency, and
- simplicity and practicability of the applied methods and procedures.

Whereas the first three performance indicators (transaction cost, uncertainties and project risks) should ideally be minimised, the latter two (transparency and simplicity/ practicability) should be maximised. The design of the legal framework for the CDM should be done with a view to this ”minimax” exercise. The evaluation, therefore, touches upon operation and performance of the AIJ projects in the subsequent sections where appropriate.

Given the open character of the AIJ pilot phase, not all project phases deserved the same attention. Nevertheless, project preparation and implementation provided particularly relevant experiences with regard to methodological as well as some of the operational questions for the corresponding CDM project phases (bold in figure 2). Procedural issues range from approval, validation, monitoring, verification, to certification. They are closely linked with the institutional set-up. As AIJ projects were not designed with a view to potential certification of emission reductions, there will be limited experiences from the AIJ pilot phase for these other phases of the potential CDM projects.

4 Assessment Procedure

The twenty non-sink related AIJ projects in developing countries were assessed in four steps: First, only literature on AIJ projects submitted to official entities by the project partners involved was used, particularly the Uniform Reporting Formats (URFs). The scope of such an assessment is confined by the inherent shortcomings of any reporting system: for various reasons, information might not be included or might be presented improperly. In addition, the information might not be continuously updated so that the project in fact might already have proceeded to a further and advanced phase of implementation. In a second step, therefore, information obtained from responses to a questionnaire was included. Third, visits to selected projects offered very valuable insights. Finally, complementary literature helped to fill partially the gap in project coverage. The approach is generally limited to a qualitative assessment and does not intend to quantify overall project performance or to rank projects.

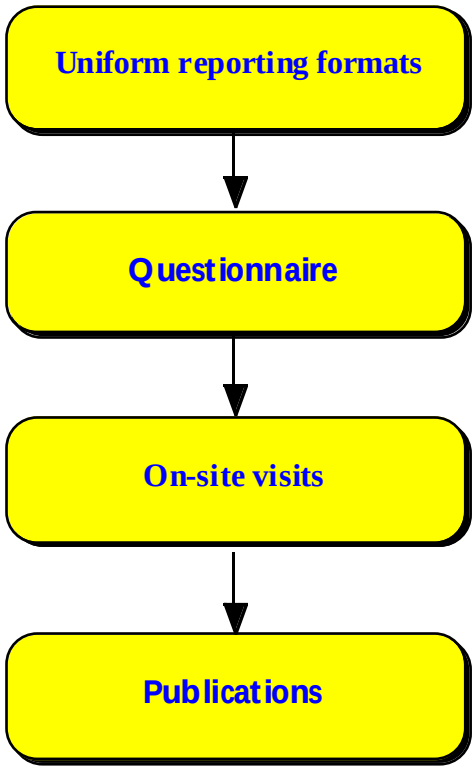
In summary, information on the scope, the methodology applied and the performance of these projects has been taken from four sources (Figure 3):

(i) the uniform reporting formats (URFs),
(ii) responses to a questionnaire sent to individuals involved in AIJ project implementation,
(iii) visits of selected projects and discussions with project implementers on site,
(iv) other publications on the projects.

4.1 The uniform reporting formats (URFs)

The URFs of the twenty non-sink related AIJ projects in developing countries are submitted by the project partners involved and published by the Secretariat of the FCCC on its homepage (http://www.unfccc.de). To assess the approach used by the project developers and implementers in their respective project, a number of questions were looked at concerning environmental additionality of the project and its contribution to sustainable development (Appendix 1).

Figure 3: Information sources



4.2 Questionnaire

After first discussions with project developers, the shortcomings of the official information channels had become obvious. It was agreed that additional to the URFs standardised responses to a questionnaire were necessary.

Such standardised responses would ideally allow cross-comparisons and the extraction of general tendencies. More importantly, such a questionnaire would help to update the information gained from the URFs, that sometimes have not been readjusted to the projects development since 1997. In this context, only a questionnaire was felt appropriate that primarily focuses on the institutional set-up wherein the AIJ projects were built up. Following these premises, the questionnaire consisted of four components:

1. GENERAL INFORMATION: the respondent was asked to state the project developers addresses and to indicate all publications that deal with the AIJ project in question.

2. CALCULATION OF GREENHOUSE GAS EMISSION REDUCTIONS: the respondent was asked to indicate the entity that determined the GHG offsets and which methodological approach was chosen. In order to understand the elusive GHG impact the questionnaire demanded to state non-measured GHG impacts, the constraints that determined the credit period and all input variables that were used to calculate the GHG-offset.

3. ASSESSMENT OF SUSTAINABILITY: this section focused on the implementation of the criterion that projects shall be compatible with and supportive of national environment and development strategies. The respondent was asked to state institutions involved in the assessment and to list existing guidelines targeted to ensure the compatibility with the host countries development and environment strategy. Furthermore, the questionnaire contained a table of sustainability indicators. This approach owes much to the ILUMEX reports (World Bank 1999) whose method consisted in exploring qualitative changes of various sustainability indicators. Supplementary to qualitative changes, this table required to state whether the project developers had pre-estimated changes in these indicators.

4. MONITORING AND VERIFICATION: the respondent was asked which monitoring activities were underway and which entities had their say in this matter. The questions also explored deviations from the GHG offset reported in the URF.

4.2.1 The target group of the questionnaire

Preparing the empirical research, a main observation was that project developers were typically very reluctant to spend time on, in their view, somehow void AIJ issues. To guarantee a certain minimum backflow of information, a wide set of project developers had to be asked. It was therefore decided to send the questionnaire to all project developers listed in the URF. One ambiguity peculiar to the URF is the role that a listed project developer played in the projects implementation. The only hint at the moment is the box „functions(s) within the AIJ project activities“. As an illustration one might take the inclusion of Micon, the Danish provider of wind turbines, in the URF of the Aeroenergia project. Evidently, this fact might have led to an unnecessary inflation in the number of receivers of the questionnaire. After some correction (i.e. elimination of entities that where stated in the URFs but were believed not to be involved in the AIJ process), the questionnaire was send to 69 addresses in the end of July. In the first weeks the backflow was very poor. Hence, the Ensadec team decided to send reminders via fax and e-mail in the end of August.

4.2.2 The responses

The first response reached the Wuppertal Institute in early August, wherein the project developer appeared very surprised to be approached by a German research institute (SISCO 1999). Apparently, he had had no idea of the information channels. A response fax, from Solar Electric, the project developer of the Sri Lanka rural electrification project, apologised for non-disclosure of information because of heavy workload (Solar Electric 1999). Table 2 gives an overview of the backflow with regard to the twenty projects:

Table 2: Responses to the questionnaire

Project	Response from	Type of Response
San Ramon Rural Electrification	Bolivia	Questionnaire
COGAS/ANELEC	Bolivia	Questionnaire
Burkina Faso Sustainable Energy Management	World Bank	Questionnaire
Renewable Energy Mini Grid Project	USA	Questionnaire
Methane Emission Reductions at Coffee Mills	Netherlands	Intention to fill in questionnaire
Methane Emission Reductions at Coffee Mills	Costa Rica	Questionnaire
Bio-Gen Project Honduras	USA	Address unknown
Sri Lanka Rural Electrification	USA	Refusal to fill in questionnaire
Aeroenergia	USA	Address unknown
Effective Energy Use in Steel Industry	Thailand	Intention to disclose information
Effective Energy Use in Steel Industry	Japan	Intention to fill in questionnaire

Summarising, it can be said that sending out the questionnaire was very time consuming. Although responses reached the research team even after the phase of fieldwork, the backflow was relatively limited. Five out of twenty projects sent fully filled-in questionnaires. This response has to be considered a success given the experienced problems to identify working contact addresses, the general reluctance, as well as the fact that two of the projects on this list never really took off[4]. As not all of the projects are covered, tendencies can be deduced with great caution only. Nevertheless, the returned questionnaires provided supplementary insights in addition to the project visits.

4.3 Visits of selected projects and discussions with project implementers on site

The on-site investigations proved that much more data is available than communicated. A number of project developers have been so kind to provide detailed insight into their projects. Because resources were limited, the visits of projects concentrated on one region only, Latin

[4] Introduction of High Efficiency Illumination in the Residential Sector and Bio-Gen Biomass Power Generation Project.

America. Nevertheless, for project selection a number of criteria had been considered. Priority was given to

- projects involving most active host countries, such as Costa Rica,
- projects involving most active investor countries, such as the USA and the Netherlands,
- projects involving international institutions, such as the World Bank,
- projects that contribute to a more balanced regional representation.
- early developed projects to gain insight in experiences made in a later implementation phase
- projects that represent different project types such as large versus small scale projects or projects addressing different greenhouse gases.

These considerations led to the selection of the following AIJ projects for a more detailed assessment: Bio-Gen Biomass Power Generation, Solar Based Rural Electrification, Methane Emission Reduction, and Aeroenergia. These will be introduced in the next sections.

4.3.1 Bio-Gen Biomass Power Generation Project: project history and current status

Biomass plants are excellently suited for the lumber industry; its by-product wood waste (sawdust and small pieces of wood) may serve as ingredient for biomass plants that generate electricity and steam whose heat in turn may be used to dry wood. A study by USAID confirms that indeed, biomass plants at small scales constitute profitable investment options for Honduran sawmills (USAID 1991). Such power generation systems have been used in Honduras in sizes up to 4 MW (Zelaya 1999).

The above reasoning applied to the original plan of the Honduran project developer - Ricardo Lima, a sawmill owner. However, after the pre-feasibility study it was decided to increase project size to two 15 MW biomass plants. The project became a joint venture between Nations Energy Corporation in the United States and Lima. And the project developers applied for inclusion into the USIJI program. In October 1995, USIJI approved both plants as Bio-Gen Biomass Power Generation Project, Phase one and two (URF Bio-Gen 1997). Before, the Honduran Minister of Natural Resources had approved the project. Parallel, project development went on: The biomass supply was secured, the plants were designed. In 1998 the Honduran Government opened up the electricity market[5] and offered certain incentives for renewable energies (Lima 1999, Flores 1999). Nevertheless, the project is still pending. Its current status is as follows: The Honduran office of Biomasa Generacion is closed, Nations Energy Corporation tries to sell the project, which is why almost all documentation is inaccessible.

4.3.2 Solar-Based rural Electrification in Honduras: project history and current status

The Honduran Census from 1988 accounted 391,959 rural households who did not have access to the electricity grid (Enersol 1994), which is a considerable fraction of the Honduran population. Since then, the situation has not changed much. In the nineties, technology of photovoltaic systems advanced considerably, so that solar home systems (SHS) became an economically feasible and technically sound alternative to provide electricity in rural areas

[5] Recently, there has also been pressure from the IMF to privatize the electricity board ENEE (EIA 1999).

without access to the electricity grid. The technical features are straightforward: solar cells provide the energy to charge batteries, the stored energy is typically used for lighting - usually light bulbs between 15 W and 40 W are employed-, radio, and television (Zepeda 1999, Nielsen 1999, Verani 1999).

Enersol Associates is a non-governmental organisation working to bring solar energy to rural people in developing countries[6]. In 1992 Enersol started action in Honduras; in 1997 the legally independent non-profit, non-governmental association ADESOL Honduras was founded. Although an Honduran organisation, it is affiliated with and receives financial contributions from Enersol Associates (Adesol 1999, Adesol 1999a). Before 1992, solar technology was not available in Honduras. Enersol first realised a so-called pilot project wherein it set up an office in Tegucigalpa, established stable contacts with local non-governmental organisations, and trained the first micro-entrepreneurs in installing and maintaining SHS. Subsequently, Enersol formulated the proposal to USIJI in November 1994. The Honduran Minister of Natural Resources and the Environment approved the AIJ project on the 19 October 1994; USIJI approved in 1995 (Enersol 1996).

The purpose of the originally proposed AIJ-Project was the installation of SHS in rural households that could not afford to buy the SHS on a cash basis[7]. From the experience already made in the Dominican Republic, Enersol knew that providing a three year loan would significantly reduce the threshold for the poorer rural households. Therefore, Enersol intended to attract capital into a special revolving fund "Fondo Solar" which would serve as a US Dollar backing to the planned consumer loans. It is important to understand that Enersol would not provide direct consumer loans, but would co-operate with local NGOs - among them COMARCA and AHDEJUMUR - which would disburse the loans amongst the households. Thus, Enersol would only back the loans given out by the Honduran partner organisations. Additionally, the AIJ-Project would include training and administration components.

Reading the USIJI proposal from 1994 reveals that the funding was not settled at this time. To meet the uncertainty, the project developers included various funding scenarios dependent on the source and amount of capital that they might attract[8]. Possibly, due to this uncertainty the original proposal did not include the exact figure of SHS that would be installed under the scheme. Funding could not be realised as anticipated in the proposal (Nielsen 1999). Despite this, the activity went on, the difference being that the majority of the SHS were sold on a cash basis. A market for SHS developed. There have been three different channels of distribution of SHS: The providers of SHS have sold them directly to the customers, the micro-entrepreneurs have sold SHS either for cash or for a loan provided by COMARCA and ADHEJUMUR, and the SOLUZ company has rented out SHS[9]. As the market developed only a broad picture can be sketched. Around 4000 SHS are operational in Honduras now - out of which around 2500 are registered with ADESOL, i.e. the SHS were installed by the micro-

6 Enersol is also active in the Dominican Republic.

7 In 1994 the project developers estimated that one SHS costs between 400 and 800 US$. In conversations, however, a price at roughly 1,000 US$ was mentioned (Nielsen 1999), the increase stemming from inflation and currency risks.

8 The scale ranges from 100,000 to 250,000US$ from private investors to an MDB loan of 1 Mio US$ (Enersol 1994).

9 Renting out SHS also reduces the threshold for poorer rural households.

entrepreneurs and financed either directly or through a loan from COMARCA. Roughly 1500 SHS were sold by the providers or are rented out by SOLUZ (Zepeda 1999, Nielsen 1999). Of the 2500 SHS registered with ADESOL between 20 to 30 percent were financed through loans (Zepeda 1999). Apparently, there have been talks with USIJI to include all SHS active in Honduras in the AIJ-Project, despite the delineation from the original AIJ project (Nielsen 1999).

4.3.3 Methane Emission Reduction at Waste Water Treatment Plants in Coffee Mills: project history and current status

In Costa Rica the coffee industry is an important export industry. There are almost 100 operating wet coffee processing plants in Costa Rica that annually process an amount of 875,000 tons of coffee berries. The main by-products of the process is coffee pulp, approximately 360,000 tons, and process waters, approximately 10 million m^3, which generally used to be discharged into the nearest river.

In 1992 the Government of Costa Rica and representatives of the coffee sector signed an agreement to substantially reduce the polluting load on the rivers. The last measure of a series of action to improve water quality foreseen in the agreement was the reduction of the polluting load to 1.5 kg COD/fanega[10] through end of pipe waste water treatment scheduled for 1997-1998 (BTG 1997). At the time when the planning was done, essentially two technical options were available: first, the anaerobic lagoon process, in which micro-organisms perform the biological degradation of the organic contamination in conditions without oxygen. Second, the anaerobic reactor process, which does not differ in the biological degradation process but in the means of control of the chemical reaction. As the reactor is much smaller than the open reservoirs used in the first case, methane capture and subsequent burning is technically feasible.

The Biomass Technology Group (BTG) was involved in adjusting an already well-functioning technology - the Upstream Anaerobic Sludge Bed Reactor (UASB) - to Costa Rican circumstances. Despite the technical appropriateness, the original UASB process could not be employed in the Costa Rican coffee industry, the high cost being the constraint. Therefore, BTG developed a low cost version of the process, which according to the project proposal combines low investment costs and low treatment costs. However, even the low cost reactor proved too expensive for the Costa Rican Coffee initiatives. Hence, the Dutch Government decided to include the installation of the BTG reactor at four coffee mills[11] in the Dutch Joint Implementation Programme. The Dutch Ministry of Foreign Affairs paid the difference in costs; in exchange it obtained the right for the emission reductions. All four reactors are operational now. BTG transferred its knowledge to Amanco de Costa Rica - a Swiss capital dominated investment company, active in Latin America. The baseline confirmation has already been done (Hensen 1998) and a monitoring study will be done during the coffee harvest 1999.

[10] COD -Chemical Oxygen Demand is a measure for the quality of water. 1 Fanega is a weight measure used in the coffee industry. 1 Fanega = 400 liters of coffee berries = the volume needed to produce approximately 1 Quintal (45,4 kg) of end product, i.e. coffee .

[11] Coopro Naranj, Coope Libertad R.L., Coope Palmares R.L., Cafetalera Pilas S.A.

4.3.4 Aeroenergia S.A. Wind Facility: project history and current status

As in many developing countries, the Costa Rican energy sector expands at high rates. The country's climate is ideally suited for wind power generation. Wind power already accounts for more than one percent of the net electricity generation (MIDEPLAN 1999). Aeroenergia is one of three wind projects included in the USIJI program. With 6,4 MW electric capacity it is the smallest of them. Sixteen wind turbines each consisting of three wind blades and a generator with two modes of operation (400 kW/100 kW power), make up the Aeroenergia wind farm. The farm is located in the Guanacaste region in Costa Rica - an area particularly suited for wind projects[12]. Operator is the AERONERGIA S.A - a joint venture of Power Systems Inc. and Aeroenergia, the Costa Rican partner. Another institution stated in the uniform reporting format, Bluefields International, was only involved in the project financing. The project has been operational since May 1997. It sells electricity to the Costa Rican utility ICE. Monitoring of the produced electricity is straightforward, as it is part of the power purchase agreement. No baseline justification studies were accessible.

4.4 Other publications on the projects.

In order to best utilise information available and to broaden the information basis for the evaluation, further background information was considered: first, reports on projects not approved at the time of the meetings of the subsidiary bodies in June 1999. Second, information on AIJ projects in Central and Eastern Europe (Annex-I) whenever this appeared to provide helpful additional information and is transferable to developing country projects.

12 Another GEF wind project and other AIJ projects are in the vicinity.

5 Observations

The more detailed investigation of AIJ projects on site proved that much more information and data is available than communicated. In the following section, the empirical findings of the assessment are presented. The first part provides findings regarding the general performance of the AIJ projects in developing countries whereas the second part focuses on methodological issues.

5.1 Performance of non-sink related AIJ projects in developing countries

It was a rather obvious, nevertheless striking observation that it was not possible to assess the current performance and state of implementation of the projects or of its operation on the basis of the official project information. The questionnaire, talks and visits proved vital to assess the state of implementation of the projects in the sample. After sending out the questionnaire and after the visits to Honduras and Costa Rica, the information base was considerable wider than what is provided by the official UN information channels. It would have been preferable to visit more projects to obtain a better picture on the AIJ pilot phase. At the moment, any assessment should strongly build on first hand information. In order to give an impression, in table 3 all projects are categorised according to the state of implementation:

Table 3: State of implementation of the projects in the sample

No	Activity title	Parties (H/I)	Project status	Source	URF
1	Air conditioner Energy Conservation Programme for the Solomon Islands	Solomon Islands/Australia	**no information**	no source	6/98
2	Burkina Faso Sustainable Energy Management	Burkina Faso / Norway	partially implemented and operational	Questionnaire, Heister et. al. 1999	97, 6/99
3	COGAS/ANELEC	Bolivia/Netherlands	**not yet implemented**	Questionnaire	
4	High Efficiency Lighting (ILUMEX)	Mexico/Norway	operational, monitoring & verification in place	World Bank 1999	96/97
5	Installation of Coke Dry-Quenching Facility	China/Japan	**no information**	no source	6/99
6	Integrated Agriculture Demand Side Management AIJ Pilot Project	India/Norway	**not yet implemented**	Heister et.al.1999	6/98
7	Introduction of High Efficiency Illumination of the Residential Sector	Honduras /Netherlands	**not implemented**	Site visit	
8	Rural Electrification in the San Ramon Area	Bolivia/ Netherlands	partially implemented	Questionnaire	
9	Methane Emission Reduction at the Wastewater Treatment Plant in Coffee Mills	Costa Rica/Netherlands	operational, monitoring & verification in place	site visit	6/98
10	Aeroenergia S.A. Wind Facility	Costa Rica /USA	operational	Site visit	96,97
11	APS/CFE Renewable Energy Mini-Grid Project	Mexico/USA	operational	Questionnaire	6/98
12	Bio-Gen Biomass Power Generation Project Phase II	Honduras/USA	**not implemented**	Site visit	96,97
13	Dona Julia Hydroelectric Project	Costa Rica /USA	operational	Fax from project developer	96/97
14	El Hoyo-Monte Galan Geothermal Project	Nicaragua/USA	no information	no source	97

Table 3 cont.

15	Grid-Connected Photovoltaic Project	Fiji/Australia	no information	no source	6/98
16	Kilung-Chuu Micro Hydel Bhutan	Bhutan/Netherlands	operational	Bhutan 1996	97,6/98
17	Plantas Eolicas S.A. Wind Facility	Costa Rica /USA	operational	site visit	96,97
18	SELCO - Sri Lanka Rural Electrification	Sri Lanka/USA	**no information**	no source	6/98
19	Solar-Based Rural Electrification in Honduras	Honduras /USA	operational	site visit	97,6/98
20	Tierras Morenas Windfarm Project	Costa Rica/USA	operational	site visit	96,97, 6/98

Summarising table 3, it appears that only eleven projects out of the project sample are at least partially operational. Of these, two have already done monitoring and verification. It should be noted that one should always expect major deviations of the project reality from what is outlined in the URF. It proved a weakness of the questionnaire not to have explored deviations from the URF systematically.

An example of the hindrances to project implementation in the case of the Bio-Gen Biomass Power Generation Project is provided in Box 1.

Box 1: Bio-Gen Biomass Power Generation Project:
Why is it not operational?

According to USIJI, both phases of the Bio-Gen power generation project are in progress (Dixon 1999), i.e. nothing indicates a delay. In practice, the American investors have tried to sell the project for months now. To obtain information is difficult: the Biomasa Generacion office in Honduras is closed. When approached, Nations Energy required to fill in a "confidentiality agreement" (Harloff 1999). Possibly due to the fact that the Wuppertal Institute could not convey its interest in buying the project, access to information was denied.

In Honduras, various people involved in the Bio-Gen project were interviewed, but no consistent explanation for the delay could be investigated. According to the Honduran project developer, the reason for the denial of the power purchase agreement was the missing guarantee that only waste would be burned (Lima 1999). A scientist at the Universidad Nacional Autonoma de Honduras, Energy Department, referred to the terms of reference of the power purchase agreement: the Honduran utility did not offer a price guarantee for Biomasa Generacion (Flores 1999). At a workshop held in Tegucigalpa that gathered many Honduran decision-makers active in the environmental field the Bio-Gen project offered material for discussion (Workshop 1999). However, even there no one could clearly answer why the projects implementation failed.

To present a fair picture: Honduras is currently very busy repairing the infrastructure that Hurricane Mitch destroyed. So the extraordinary circumstances might be blamed for the delay. However, the difference in the delivered explanations is noteworthy, as is the fact that government support vanished when the new government took office (Zelaya 1999). Therefore the Bio-Gen project can serve as an illustration of the major obstacles that the institutional set up can be.

Five projects on the list did not deliver any information. Looking more closely reveals that, if the Honduran and Costa Rican projects had not been visited, the number of projects that did not deliver any information would jump up to maximally eleven. This figure alone illustrates the low coverage of Non-sink AIJ projects in the official information channels but also in the literature. The table also illustrates that the URF is insufficient to draw conclusions on the state of AIJ projects. Sometimes URFs have not been updated since 1997. There are also projects that did not deliver URFs but that are successful. Another finding is that the time between first appearance in the official information channels and actual implementation is typically longer than one year.

Generally, the specific insights as regards the organisation of an AIJ project and the methodological approaches are limited in scope. The main reason is that no incentives were provided for the emissions reduced in AIJ projects. Furthermore, expectations from project developers were high at the beginning but frustrated when it became clear that no credits could be obtained during the pilot phase. Therefore, important aspects like monitoring could not really be demonstrated. The more in-depth investigation through the questionnaires and visits showed that there are only comparatively few projects which are in a mature state of implementation.

Both the questionnaire and the site visits provided important insights into the operation of AIJ projects. Particularly, it shed a light on the division of tasks between the project developers in the host and in the investor country. Reading between the lines of, for example, the response fax from SISCO reveals that the project developers in Thailand did not know very much about the official UN structures that serve to communicate AIJ (SISCO 1999). In their fax they explain that their Japanese partner will take over the filling in of the questionnaire. This type of division of responsibility could again be observed when visiting project sites. Investor country representatives appear to dominate the AIJ project components.

Because of the limited number of non-sink AIJ projects, there is only a small number of different project types with a regional concentration of pilot projects, and some potential project types are not covered at all (fossil power plants, cement plants, etc.). Although the expected project types dominated, however, a number of new projects has been developed creating solutions for specific industrial processes, for example the Methane Emissions Reduction project.

It appeared that demonstration projects and studies are of particular relevance to understand the specific problems encountered with the respective project types. Ex-post studies of projects in an advanced stage of implementation revealed that problems unforeseen during the project preparation can change the project in character significantly, as for example in the Adesol project (Box 2).

Box 2: Solar-Based rural Electrification in Honduras: ***What is the project?***

When reading the URF the project should consist of the installation of between 2,000 to 5,000 SHS in rural Honduras. Two components are mentioned in the uniform reporting format: the establishment of local solar-electric service enterprises, i.e. of the necessary infrastructure and the establishment of end-user credit programs (URF Solar-Based rural Electrification 1997).

In fact the infrastructure to start the program was already in place when Enersol applied with USIJI. That is to say the solar-electric service enterprises had installed the first solar home systems, an office had been established, and the main institutional barriers had been overcome. So the proposed AIJ-project would have consisted, exclusively, of the installation of credit financed SHS. Parallel to the AIJ project direct distribution of SHS would have gone on without claiming credits for these SHS.

When visiting the site, the AIJ project looked entirely different again. Indeed, the various actors had installed around 4500 SHS. However, as the financing of the revolving fund had never come into being, project implementers had explored alternative innovative means of distribution. Credit financing became a minor instrument. Instead, renting out SHS and selling them directly proved successful. A market had developed rendering the establishment of a truthful accounting system and monitoring relatively difficult (Zepeda 1999, Nielsen 1999).

Foreseeing a projects „environment" and therewith a projects performance is very challenging. Yet the example demonstrates the necessary flexibility of a reporting system. But more importantly, it underlines the strong connection between reporting and criteria. If for example barrier removal were made the decisive criterion then these will have to be reported. Reading the URF in this example would have suggested that the project was about overcoming barriers of knowledge, of missing infrastructure and of financial barriers. On the contrary, the actual project was designed to tackle exclusively the financial barrier faced by poor households.

5.2 Assessment regarding the AIJ criteria „environmental additionality" and „contribution to sustainable development"

5.2.1 Environmental additionality

As a general observation regarding the determination of the environmental additionality of projects, there is no systematic approach yet in place. The additionality of AIJ projects is difficult to determine as the majority of these projects appear to have been developed for other purposes, for example in a development context. Usually, the time necessary for project development in combination with the fact that incentives were not available in the pilot phase resulted in quasi simulations of AIJ, taking projects from other programs, pipelines and at best adding AIJ components to the projects. All projects involving private investors needed to be profitable on their own. This has been communicated by project developers on site. At the project level in both the host and investor countries, the understanding of environmental additionality appeared to be very broad and very different from the internationally negotiated and discussed concepts. A translation of the concepts for the purposes of the project developers seems to be missing. An indication that supports this imbalance is the above described "division of tasks" between host and investor country actors: AIJ related aspects of the projects are mainly carried out by investor country actors. The results appear often to be not communicated to the host country partners.

5.2.1.1. Reference case or baseline formulation and justification

The formulation of the project's reference case or baseline is the precondition for the calculation of the project's emission reductions. The assessment of the twenty projects showed that AIJ projects at present apply a wide variety of different approaches to identify and measure reference cases or baselines for the respective project. Because AIJ projects fall into only a few project categories, experience in baseline determination is limited to specific project types. With regard to the information officially submitted on this matter, the reference case has always been described but the level of precision varies significantly (for example as described in Box 3). The variety in the level of detail for the justification of the emissions in the reference case is significant.

Box 3: The Bio-Gen biomass power generation project: ***What is the reference case****?*

The description of the reference case of the Bio-Gen project is dispersed all over the URF. Firstly, in what is headlined "project description", the URF reveals that the carbon offset would stem from substituting a potentially built oil fired plant by the biomass plant (URF Bio-Gen 1997: 1).

A second more complete description of the reference case is contained in the part "scenario description". Here the project developers mention that in addition to the assumed oil fired plant, the sawmill, logging, and palm plantation wastes would continue to be disposed of through uncontrolled burning (URF Bio-Gen 1997: 8).

Within the URF there is no space to include a justification of the reference case. Obviously, the assumptions concerning the oil fired plant need to be justified. But as a second component of the reference case justification the developers should, in theory, prove that the uncontrolled decaying of the biomass will go on for the entire lifetime of the project.

Furthermore, reference cases have mainly been determined on a case by case basis. The international discussion on benchmark setting, thus, is not reflected at the project level. Hence, there was no evidence that AIJ projects generally imply the use of benchmarks as solutions for difficult reference case determination. Benchmarking has been applied in four rather similar projects in Costa Rica only. In these cases, benchmarking served as a simplification of the formulation of the reference case. This is described in more detail in Box 4.

Box 4: Aeroenergia S.A. Wind Facility: ***Simplification versus accurateness?***

Wind facilities are inherently dependent on exogenous variables; the daily amount of wind is impossible to predict and so is the short-term supply of energy produced by the wind facility. On the other hand, demand for electricity varies over the seasons and even over the day. The art is therefore to design an energy system that in total adds up to reliable energy supply. In Costa Rica findings suggest that wind facilities can be balanced against hydroplants: Wind is high during dry season and water is abundant during rainy season. It is therefore obvious that the greenhouse gas impact of a wind facility can only be calculated when studying the entire electricity grid. Following a source-driven approach the system boundary must be chosen such that all GHG sources technically dependent upon the mode of operation of the AIJ project are included. Therefore the system boundary is bound to be the borderline of the entire electricity system.

The original proposal to USIJI contained a study that models the entire Costa Rican energy system with and without the wind facility in place[13]*. The emission reduction is then the difference between the emissions of the total system with and without the installed wind facility. Interestingly, the study bundles up several wind projects. Three scenarios were performed: one without wind energy, one 10 MW and one 60 MW wind capacity scenario. As could be expected, complexity increases impressively, when entire energy systems are studied.*

[13] The study was done on behalf of the GEF.

Box 4 cont.

The greenhouse gas emissions within the system depend on the capacity expansion plans[14]*, the future energy demand, and not the least on the weather. To meet the complexity, the study relied on forecasts of the energy demand, statistic data on the availability of wind and water, and data on the timely distribution of the energy demand. The model proves that once the baseline*[15] *is negotiated emission reductions can be calculated and verified very accurately*[16].

In practice, however, the greenhouse gas calculation differs: Political interference caused ambiguities. In September, 1994 the Minister at MINAE announced a complete withdrawal from fossil energy by 2001, that is to say the entire energy demand will be met by renewable energies. Despite serious doubts about the likelihood of the goal, it is the basis for a second calculation of the greenhouse gas emission reduction, which is represented in the URF. Therein the calculation is very straightforward; in fact it provides the first benchmark used to determine the GHG offset: The authors calculated specific emissions per kWh in the period of 1997 to 2001. With the gradual phase out, the specific emissions diminish each year until they reach zero in 2001.

The latter computation obviously constitutes a significant abstraction. Given the present situation the phase out of fossil fuels is rather unlikely. The actual emission reductions are, therefore, significantly higher then outlined in the URF.

Apparently, it is possible to determine GHG emissions accurately, even when they are dependent on random variables like the weather. The real problem with wind parks is the missing one-one relationship between reference case (e.g. gas fired plant) and AIJ project, i.e. there is no reference case thinkable that perfectly substitutes the wind park. Yet, this example shows that once the capacity expansion plan is agreed, simulations can help to determine the GHG offset.

A description of the justification of the project's reference case is not explicitly included in the URFs. Unfortunately, the answers to the questionnaires did not provide more detailed insights into the justification of reference cases. The project developers of the Methane Emission Reduction Project, for example, did not experience difficulties to justify their reference case because their project proposal already included a simplified feasibility study to set up the open pond. By contrast, project developers in the Adesol project assumed that the poorer households would continue to live without using electricity (compare also Box 3 for the Bio-Gen project).

5.2.1.2 The justification of why the AIJ case is additional

The assessment of the URF revealed that in most cases a justification of why the AIJ cases are additional (i.e. that the AIJ case is done because there are certain extra incentives) was badly reported. This is due to the major flaw of the AIJ pilot phase, i.e. that the setting of incentives was left to the investor countries. Box 5 describes some of the general explanations provided by project developers.

14 There are plans to increase renewables and thermal plants to meet the fastly rising energy demand

15 That is the capacity expansion without the wind facility.

16 Data gathering is not a problem, as continous records that show the amount of energy sold at various times to ICE, the Utility, are part of the power purchase agreement.

Statements on the additionality of the AIJ case in the projects under observation followed investor country guidelines: USIJI focused on barrier removal whereas, for example, in the Dutch programme incremental costs served as decisive criterion. For example, under the specific conditions of the Methane Emissions Reduction Project the approach was appropriate. However, given the small project sample, one cannot deduce the general applicability of the incremental cost concept to all possible AIJ projects.

Box 5 ***How project developers described the additionality of their project****:*

- *the project xy "... fulfils the additionality criterion because the potential project implementers are more likely to go ahead with their investment (...) if it receives investor country evaluation panel acceptance as a joint implementation project."*
- *" ... that inclusion in the investor country programme will help martial project sponsorship and capital investments(...)."*
- *Projects were considered additional because incremental costs were positive.*

As mentioned in section 3.1, "project barriers" are discussed as a method to determine the additionality of the AIJ cases. However, it proved time consuming to identify project barriers during visits and talks on site. Nevertheless, the visits already showed that barriers have been high thresholds to project implementation (Box 6). It appears that only some of the potential barriers can be addressed by project developers and implementers. Other potential barriers may not be successfully addressed by project developers, for example distorted price regimes (Amin 1999), unclear lines of responsibility for AIJ matters, or institutional barriers as in the Bio-Gen project. etc.

Box 6: ***Project barriers****:*

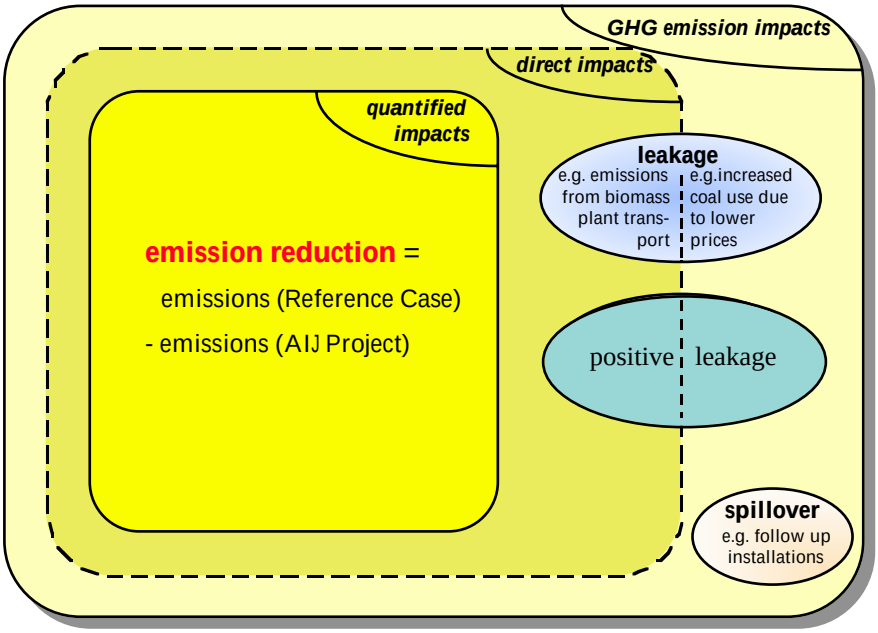
Barrier	Project	Description
financial barrier	Rural Electrification	rural Households do not have access to consumer credits and cannot afford cash payment
financial barrier	Aeroenergia	costs per produced kWh are to high in comparison to prevailing prices
technological barrier	Wastewater Treatment	reactors used in ICs are to high-tech, i.e. to expensive
cultural barrier		
barrier of knowledge	Rural Electrification	solar technology was not established in Honduras prior to Enersol activity
institutional barrier	Bio-Gen	Honduran electricity market was not open to investors prior to Bio-Gen project
institutional barriers	Bio-Gen	to obtain power purchase agreement from Honduran utility proves difficult

5.2.1.3 Disaggregation of the total greenhouse gas impact

In order to make the reference case and the AIJ case comparable, it is necessary to define the system boundary of the respective project: which direct or indirect impacts should be included in the calculation of the emission reduction and which of these can be measured and quantified. The project sample showed that there is no consistent methodology yet in place that helps determining the system boundary.

Furthermore, there is no consistent treatment of impacts within the system boundary. The terminology used in international negotiations and scientific discussions is often not

Figure 4: Scheme of the concept of system boundaries



precisely defined. For example, leakage currently denotes such complex effects as in DSM, but also denotes phenomena such as the measurement of various types of uncertainties (Figure 4). There is no systematic treatment and classification of indirect impacts yet.

The same picture was provided in discussions on the projects on site. The range of how project developers deal with the problem is very broad. However, a number of potential indirect impacts have been identified, among those are, for example, carbon embodied (e.g. in solar panels), GHG impacts due to price changes that occur in the aftermath of the AIJ project, and GHG impacts due to changes in income. The indirect effects may have a significant magnitude, but are in most cases not systematically addressed or quantified. The Methane Emission Reduction Project is an example for positive indirect impacts as it serves as a demonstration project in Costa Rica. It also is a good example for the disaggregation exercise which is described in more detail in Box 7.

Box 7: Methane Emission Reductions at Waste Water Treatment Plants in Coffee Mills:
Determination of direct impacts and reduction of complexity

The following table lists all emission sources related to the reference case and the AIJ case:

Emission sources in the reference case	*Emission sources in the AIJ case*
• *carbon dioxide component of biogas discharged into the atmosphere*	• *carbon dioxide from burned methane*
• *methane component of biogas discharged into the atmosphere*	• *biogas that seeks out of reactor*
• *carbon dioxide from burning firewood*	• *carbon dioxide component of captured biogas*

In a first step non-direct GHG impacts must be eliminated from the total GHG impact of the AIJ project. Following a source-driven approach, all GHG sources that are under control of the project developers or that are dependent upon the mode of operation of the reference case (resp. the AIJ case) are defined as lying within the system boundary.

Accordingly, the system boundary is such that all the listed emission sources are included. As direct impacts are always differences in pairs the emission sources above must be matched with their corresponding counterparts in the reference case (resp. in the AIJ case). The following table demonstrates the results of this matching exercise:

No.	*Impact*	*Source in Reference Case*	*Source in AIJ Case*
1	*impact on carbon dioxide component of biogas*	*carbon dioxide component in biogas discharged into the atmosphere*	*carbon dioxide component in captured biogas*
2	*biogas capture impact*	*methane component of biogas discharged into the atmosphere*	
3	*methane burning impact*		*carbon dioxide from burned methane*
4	*fuel substitution impact*	*carbon dioxide from burning firewood*	
5	*reactor leakage impact*		*biogas that seeks out of reactor*

Due to practical constraints the project developers reduced complexity by just leaving some direct impacts unquantified. The impact on the carbon dioxide component of the biogas is zero (No. 1) as both emission sources are, for logical reasons, equal in size. The reactor leakage impact (No. 5) is believed to be small in scale and, therefore, was left out of the quantification, it is leakage. Similarly, the fuel substitution impact (No. 4) is difficult to quantify and, therefore, was decided to remain unquantified. As its sign is opposite to the reactor leakage impact, it is dubbed positive leakage. In doing so the quantification is reduced to quantifying the methane burning impact (No. 3) and the biogas capture impact (No. 2).

5.3.2.4 Calculation of emission reductions

As the core objective of AIJ, all project information (URF and other) include the calculation of emission reductions. However, a justification of the chosen methodology as well as the values of the input variables were rarely reported. Input variables are those variables that are used to calculate the GHG emissions in the reference case and the AIJ case. The returned questionnaires report on some additional input variables as compared to the URF. It became apparent that none of the projects employed a standardised approach. However, this is not surprising given the pioneer character of the pilot phase. All projects report the employment of third party assistance for the calculation of GHG offsets. The Ensadec team did not aim at contrasting own calculations with reported GHG emission reductions.

5.2.2 Contribution to sustainable development

The sustainability assessment of the AIJ projects is to some extent structured by the URFs demand to state environmental, social and economic impacts of the project. Of those three dimensions, the environmental impacts have been considered most intensively. This fact is confirmed by an analysis of the returned questionnaires: First, those project developers who reported to have explored the sustainability issue, had in most cases explored the environmental impacts. There is an indication that these checks were done to meet legal requirements, because in some cases official governmental bodies acted as third party verifiers.

Second, the table of sustainability indicators which was filled in by all project developers responding to the questionnaire, showed that environmental indicators had typically been explored systematically in advance, whereas the remaining economic and social indicators had attracted less attention. Furthermore, the returned questionnaires showed the difficulties to grasp a project's reality with a standardised set of sustainability indicators. Box 8 provides an overview of the complexity of a project's contribution to local development .

Box 8: ***The complexity of sustainability assessment***
The case of the Solar-Based Rural Electrification project in Honduras

Social impacts can only be seen in relation to the situation of particular households before the installation of the SHS. Generally, the social impact is larger the poorer the household. Replacing the firewood by electric light constituted a completely new quality of light and led to different life patterns. First, the allocation of work among the different occupations changed: gathering firewood became pointless, the longer working day could be used to generate an extra income through various homeworks, like for example sugar cane extraction (Nielsen 1999). Second, the electric light might help to ease access to information: books can be read, radio and television can be switched on. The more well off households that use the SHS to replace diesel generators or that use it as a supplement to their pre-installation energy mix may experience a smaller impact on their life patterns. Installing SHS in villages also pertubated the social equilibrium in the villages in manifold ways. Some benefited from the new opportunity to make a living. More specifically, the self employed microentrepreneurs were reported to generate income above Honduran average (Zepeda 1999). Additionally, the visible possession of SHS became a matter of prestige (Nielsen 1999).

The social impact should be viewed in close relation to the economic impacts. In practice, the households income and spending patterns changed. For example installing SHS might help to curtail the energy bill of households as indicated by studies done in other circumstances. Economic impacts also exist on the side of the project developers. Enersol and ADESOL are non-profit organisations, i.e. an assessment of the economic impacts on them is a highly subjective issue. In macroeconomic terms, various indicators qualify the project as good, however, such an assessment is limited in scope due to the project size. The project resulted in a small capital inflow, new employment opportunities and it made new technology available.

The biggest environmental impact is the increased indoor air quality due to reduced burning of kerosene, firewood, and diesel. In the case of reduced usage of diesel generators, there also is a lower noise pollution. On a non-household level, the project contributes to the more sustainable use of forests.

In the official project reports, however, often quite limited information is provided on national objectives and framework conditions. Most cases indicated that the project is compatible with or supports official national objectives. Rarely, refe-rence was made to general sustainable development strategies or goals. In the absence of a corresponding explicit question in the URF, it is not clear if they do not exist in these countries or if there were other reasons for this shortcoming. A limited number of reports omitted information on national objectives. However, the limited material provided does not support the conclusion that projects generally do not comply with the national framework conditions. All projects have their assets. They ease, for example, pressing problems regarding the load of the national electricity supply system, help to tackle economic

development problems in rural areas or help to stop health problems arising from indoor burning of kerosene. Descriptions of positive impacts are often qualitative and focus on air pollution. Indicators apparently have not been systematically developed.

On the basis of this limited information, it is not possible to fully assess the sustainability of the projects with regard to side effects. Most that can be said is that this information does not allow the conclusion that any of the projects is not sustainable. The AIJ pilot projects predominately name quite a few side effects, often spread over different sections of the report. Nevertheless, the lists are often far from complete. For example, two wind power projects lack reference to impacts on birdlife, an argument against wing power which is often voiced by nature conservationists and, therefore, merits attention. Generally, only few negative impacts are listed. Furthermore, nearly all statements on side-effects lack backing with quantitative data and do not provide sources (assessment of the investing company, of external experts, of governmental institutions or others). Future URFs should explicitly ask for the provision of such data and facts.

Box 9: ***The relevance of the participation of local stakeholders in the planning of the Bio-Gen project***

As the Bio-Gen project is not yet operational it provides a good example of the planning phase of AIJ projects, i.e. the situation faced by the person who must check for SD in advance of implementation.

The social component of the project is very difficult to assess prior to project implementation. The biomass plant is potentially harmful to the local rural population as it might absorb wood that was previously used by families to cook and to have lighting. Additionally, there is an imbalance between the power of the microentrepreneurs who exploit the forests resources and the biomass plant operators. Naturally, the project developers had to prepare a biomass availability study wherein they compared various potential sites. This study was partially done by Prolena, an NGO that explicitly cares for the provision of energy to rural households.

After the sites were chosen reliable biomass supply had to be secured. Given the different sources of the biomass, very different contracting models were used. They range from business like contracts with the plantation owners to what is called a community based approach in areas were the forest usage is not regulated by settled tenure or property rights. In agreements the communities take over responsibility for the biomass gathering. To dissolve fears that rural households loose their sources of firewood, areas close to the communities are reserved for exclusive usage of the communities.

As regards participation aspects, the URF provide almost no information. The reports, however, do indicate that in many cases Ministries or governmental agencies do or did participate in different ways. Since the URFs lack more specific questions on participation, the quality and different kinds of participation are not clear. Furthermore, the corresponding sections in the URF were not filled-in adequately. Participation of NGOs, research institutes or others seems to be rarely the case. However, there may be cases where this information simply is not listed which was, for example, the case in the Bio-Gen project (see Box 9). Sometimes the given information did not even allow to say - without further enquiries - if a participant is an NGO, a research institute, an official governmental agency or something else. One reason is that the URF lacks a field „description of organisation“. The other reason is that often not even the existing field ”Name of Organisation (English)” was filled in.

6 Recommendations

The following recommendations appear in our view helpful to create a transparent and well-functioning CDM. Because of the small total number and the regional concentration of AIJ projects being planned and operational during the five year AIJ pilot phase, a more detailed investigation on site of other projects would surely help to substantiate these tentative conclusions.

6.1 General recommendations for the CDM

6.1.1 Improve transparency and access to information

In light of the experienced shortcomings during the preparation of the questionnaire and the on-site visits, any CDM reporting system should include detailed provisions on entities or parties involved, their contact addresses, and the state of the projects. Furthermore, this type of information must be updated continuously.

Any reporting system for the CDM will need to take into account the institutional structure yet to be developed (Annex I working group, SBSTA/COP). The division of responsibility and tasks between the different entities (operational entities, national CDM authorities, executive board, etc.) to be established will determine the kind of information, the level of detail, and the institution it has to be reported to and recorded at respectively.

Whereas the URF is the only reporting format under the AIJ pilot phase, reporting under the CDM will also have to differentiate according to the purpose of the compiled information. For example, reports to certifiers will require a significantly higher degree of accuracy and completeness than publicly available project descriptions (e.g. on the Internet). Parties, therefore, should negotiate these new reporting formats and their different qualities rather than concentrating exclusively on the further development of the URF.

The reporting duties must be clear from the very beginning of each project. In particular monitoring plans and protocols have to be in place as they will form the basis for verification and certification.

Furthermore, our analysis evidenced the strong interdependence between the concrete operationalisation of the CDM criteria and the reporting. A continuos improvement of the reporting system will have to go parallel with the evolvement of the institutional and legal framework.

As regards the AIJ pilot phase, an annual update of the URFs would be a significant step forward. In addition, the information provided should be expanded, for example, as regards the information on the contribution to sustainable development.

6.1.2 Generally follow an evolutionary and procedural approach

The Ensadec project sample showed that rather similar projects employed different approaches to deal with specific issues such as environmental additionality. At present, a standardisation of a large number of project types does not appear feasible. In the early CDM, experimenting with different methodologies appears desirable. Minimum rules (e.g. for a differentiated CDM reporting system or methodologies as described below), however, must guarantee environmental effectiveness and should help to reduce the risk of project developers.

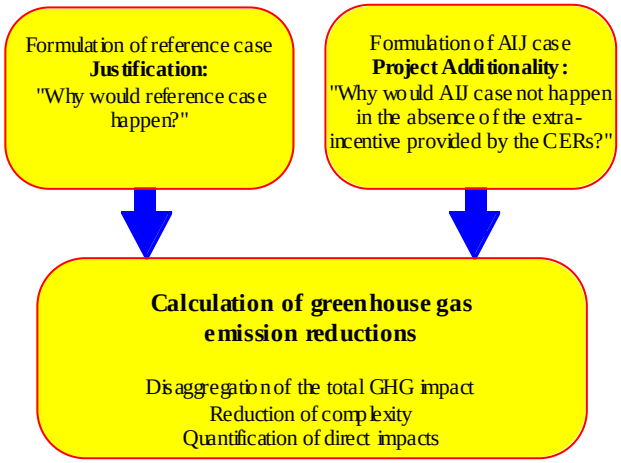
It could prove to be a particular strength of the flexible instruments to let the CDM participants decide which methodological option they will use as long as a set of minimum rules is applied. A particular emphasis should be on strong requirements for phases prior to project implementation and on monitoring.

6.2 Methodological issues

6.2.1 Environmental additionality

Regarding environmental additionality in general, the terminology used and, moreover, the approach as such should be clarified. A common terminology is a precondition for standardisation. Generally, it appears that experiences from the AIJ projects - and from CDM projects - should be better explored and utilised. A better information exchange between official entities and the project developers on site as well as between different project developers would be advisable. This is one important task of the future CDM reporting system and information channels described above.

Figure 5: Clarification of the concept of environmental additionality



The climate regime could probably benefit from an exploration of how issues similar to environmental additionality were solved in other environmental regimes, e.g. the ozone regime. The relevant institutions (SBSTA/COP) might take such an investigation into consideration.

All three elements, justification of the reference case, project additionality and measurement of GHG emission reductions, should be seen as independent components of environmental additionality (Figure 5).

6.2.1.1 Reference case or baseline formulation and justification

The reference case must be formulated and justified. This component should not be confused with baseline quantification, which is covered by section 6.2.1.4 on calculation of GHG emission reductions. Furthermore, a more comprehensive assessment and development of possible approaches for the reference case or baseline determination is necessary.

A project by project approach appears to be appropriate at present. However, the reference case chosen by the project developers should fulfil certain minimum requirements. Such requirements should at least include that the reference case chosen must not violate legal provisions of the host country, for example concerning existing environmental standards.

Reference cases should be categorised whether they consist in the „continuation of a prevailing scenario“ (e.g. as in the Solar Electrification Project) or whether they constitute a „new investment option“ - also called a greenfield situation (Italian/Dutch Contribution 1999) (e.g. like the oil-fired plant chosen as reference case in the Bio-Gen project or the open pond in the Methane Emission Reduction project). Minimum requirements must be defined according to these categories.

In case of the continuation of a prevailing scenario (for example a fossil power plant that will be upgraded or substituted), it has to be considered whether the existing plant, etc. is suitable or acceptable as reference case. A minimum requirement would then be to demonstrate that operating the reference case for the stated time is technically feasible. Moreover, it has to be guaranteed that the existing plant taken as reference case does not violate local (environmental) standards, legal provisions, or rules of operation.

A new investment option taken as reference case should also fulfil certain energy efficiency and environmental standards and not be the worst operating technology. Such a standard could be set by taking the average of recently installed similar projects in the country (region). As a result, there would be an incentive for the introduction of best available technology in the CDM case.

Benchmarks appear to be helpful if the reference case is an investment option that would not otherwise be pursued by the project developer (e.g. Aeroenergia). This might be applied to whole sets of project types (e.g. wind power). AIJ experiences so far only provide some indications where benchmarks appear inappropriate, for example in the case of project types such as DSM or waste (water) treatment.

The reference case justification has to answer the question „Why would the reference case happen?“

Project developers can substantiate their claims on the reference case by showing that its operation is economically sensible for the stated time. If the stated reference case is a new investment option, a feasibility study must be submitted. Submitting a feasibility study would render the investors claim that he would install the reference case more credible.

6.2.1.2 The justification of why the AIJ case is additional

The justification should answer the question „Why would the AIJ project not happen in the absence of the extra-incentive provided by the CERs?“

Concentrating on the barrier approach, it appears useful and feasible to distinguish at least four categories of barriers: i) technological, ii) knowledge related, iii) cultural, and iv) institutional barriers. To make barriers a criterion, it might be helpful to identify specific project barriers and how the project developer can tackle them. In doing so, a distinction can be made between barriers on which the project developers have a direct influence, and those on which not.

A recommendation for the general application of the incremental cost concept would be difficult on the basis of the limited project sample.

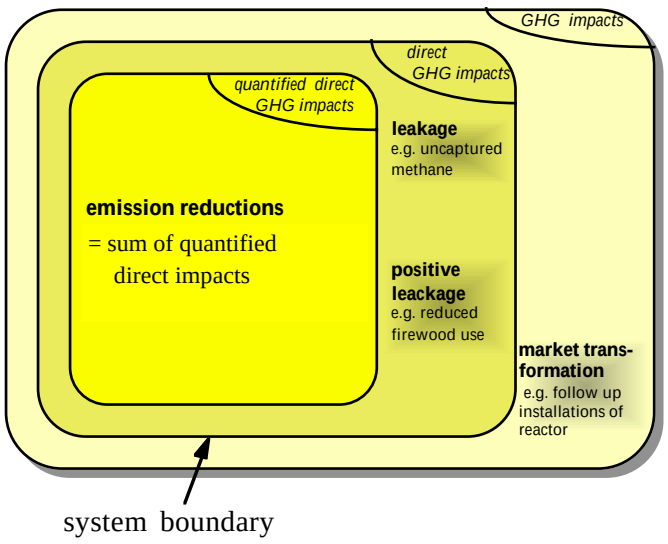
A simplified approach to decide on the additionality of CDM cases may be the development and adoption of positive lists. CDM cases included on this list would automatically be considered additional. As a precondition for adding project types to these lists, a general but country specific sustainability test should be passed. A positive list, might include several project types dealing with renewable energy. In contrast, high-risk technologies, e.g. nuclear would not be included. A listing of eligible project types does of course not affect the duty to formulate and justify the reference case. More generally, it might be preferable not to add specific project types on such lists but rather to determine a procedure according to which the eligibility of project types under specific country conditions can be determined. This way, the specific developing country conditions would have an influence on the eligibility of the respective project type. However, before any decision on the adoption of positive lists is taken, Parties should carefully consider the pros and cons of allowing for such easier decision-making processes, e.g. during the validation of CDM projects.

6.2.1.3 Disaggregation of the total greenhouse gas impact

In order to prepare for the calculation of emission reductions, it appears necessary to clarify the terminology that is currently being used among international negotiators, scientists and responsible project authorities. At present, for example, the definition of leakage is far from clear.

Installing the CDM case instead of the reference case results in the total GHG impact. The total impact can be split into direct and indirect impacts where the direct impacts are those that the project developer shall quantify. The borderline between direct and indirect GHG impacts is the system boundary.

Figure 6: The new terminology (as applied to the AIJ Project „Waste Water Treatment at Coffee Mills“)



The system boundary should be determined according to emission sources. All sources in the reference case and CDM case respectively should be identified. The system boundary should include: 1) All emission sources that are under control of the developers if they were to realise the reference case (resp. the CDM case). 2) All emission sources that depend upon the mode of operation of the reference case (resp. the CDM case).

To properly compute the emission reductions, it is then necessary to match all sources which have been decided to lie within the system boundary with their counterparts in the CDM case (resp. the reference case). In doing so, a list of direct impacts would be established, which should be classified according to quantified and unquantified direct impacts. Unquantified direct impacts are called leakage in case they are negative and positive leakage or spread in case they are positive. Figure 6 demonstrates how the Methane Emission Reduction project fits into the suggested new terminology.

Indirect impacts are typically not quantified but deserve much more attention than currently (Box 10). If indirect impacts shall be quantified in order to determine the total GHG impact of a CDM project, then life cycle analysis and econometric instruments will have to be applied.

Box 10: ***The relevance of indirect greenhouse gas impacts***

Depending on the respective technology, the inclusion of major indirect impacts into the calculation of the certified emission reductions (CERs) can change the amount of CERs dramatically. Although there are hints that this problem is significant, it remains an open question how to deal with this matter.

Imagine, for example, a CDM project including the installation of photovoltaic (PV) modules. The production of PV panels is very energy intensive. At present, the energetic pay-back time is about five years (average) (Bubenzer and Räuber 1999, Nijs et al 1997).

Indirect impacts of that CDM project (carbon dioxide emissions associated with the production of PV panels) depend on at least the following factors:
- *the specific production process,*
- *the energy source used*
- *the location of the PV plant.*

The location of the PV plant may be a criterion to decide on the inclusion of the carbon dioxide emissions from the PV production process: if the plant is located in an industrialised country, carbon dioxide emission are covered by the emission reduction commitment of that country. If it is located in a developing country, the carbon dioxide emissions are not covered by any country's commitment under the Kyoto Protocol. This issue should be addressed by the Parties.

If the negative indirect impacts would be included, then the amount of CERs would certainly shrink. In the case of the Solar Based Rural Electrification Project, this reduction would amount up to 25 percent.

6.2.1.4 Calculation of GHG emission reductions

The calculation during the validation phase serves as an estimate of the expected GHG emission reduction that will eventually be certified. Furthermore, it is a decision on the methodology applied and input variables used.

The project experiences made during the AIJ pilot phase, so far, do not allow for a standardisation of the methods to calculate the GHG emission reduction. The CDM, hence, will start with calculations on a case by case basis. However, standardisation appears feasible when based on a larger project sample.

Calculations should only use referenced values of input variables (stated in internationally standardised units) and the employed methodology should be justified and follow common industry standards.

Monitoring and verification starts with the calculation of GHG emission reductions. The variables to be monitored must match the input variables used in the calculations. The employed methodologies must coincide.

6.2.2 Procedures to ensure a project's contribution to sustainable development

Discussions on the introduction of a sustainability criterion are still heated at the international level, therefore the requirements concerning contribution to sustainable development should be tightened gradually in a step-by-step procedure.

A number of AIJ projects have already included sustainability considerations and elements during their project planning and implementation phases. There is a wealth of experience that should be used to develop a sustainability criterion.

Reporting on sustainability should be tightened. An obligation to provide qualitative information on sustainability indicators might help to pre-structure the reporting. Thus, project developers would at least be obliged to explore social, environmental and economic impacts of their project in a systematic way.

Both in light of the current international debate on a sustainability criterion and the experience gained in this study, an obligatory and quantitative pre-assessment of sustainability indicators appears not feasible at this moment. A complex procedure like that employed for the assessment of the sustainability indicators in the ILUMEX project (World Bank 1999), appears not generally applicable as a criterion for the validation of CDM projects. In that project, sustainability indicators were identified and assessed after the implementation of the AIJ case (the first verification exercise during the AIJ pilot phase). The values of these sustainability indicators were weighted and aggregated in order to obtain a single marker signifying a positive or negative contribution of the project to sustainable development (World Bank 1999). Nevertheless, Parties might further discuss if such an approach can be useful as a complementary means to assess the project impact and success.

The Parties may first concentrate on process requirements by focusing on activities that contribute to sustainable development. This might result in the requirement to execute participation processes that involve, for example, the local population that is affected by the projects implementation. Experience with the Solar Electrification Project and the Bio-Gen project shows that this would be a feasible and promising approach. With regard to participation, experience in development policy exists that should be considered. OECD papers suggest that quantitative indicator usage and monitoring of participatory approaches is feasible (DAC Expert Group 1997: 86-100). Stakeholder involvement should in any case be designed for the specific project and country circumstances, for example, regarding who the important and affected stakeholders are, and if there are established patterns of representation.

Project planning and implementation could follow established guidelines used in development policy. Parties should explore in how far guidelines already existing within the OECD can be employed (OECD Development Assistance Committee 1992).

The environmental impacts other than GHG of the CDM case of a CDM project must be „better" than those of the reference case, i.e. less negative or more positive. If social and economic impacts of the CDM case and the reference case are comparable, the CDM case should always be an improvement relative to the reference case.

It might be a sensible strategy to differentiate projects according to the amount of emission reductions they generate annually. Stronger requirements, like the requirement to carry out a full environmental impact assessment (compare OECD Development Assistance Committee 1992, No 1) could be applied if the amount of generated CERs per annum exceeds a certain limit, for example 10,000 t carbon dioxide equivalent p.a..

6.3 Capacity building

Capacity building within the host countries is absolutely vital to the success of the CDM.

The specific experiences revealed that the performance of AIJ projects particularly depended on the AIJ specific host country capacity. In general, the information base regarding the instrument "AIJ" appeared to be concentrated on the investor country authorities involved. A general CDM capacity building program tailored to the specific needs of potential host country project representatives should be linked with the CDM projects as a prime project element.

Potential host countries should already at this stage of the Kyoto-Mechanisms make full use of CDM capacity building programs and projects offered by bi- and multilateral organisations. For example, the GTZ in co-operation with the World Bank provides assistance under the National Strategies Studies (NSS) Programme which is a capacity-building tool to enhance the understanding of the Kyoto Protocol mechanisms such as the CDM in developing countries. The NSS aims to define options and devise strategies for a country to best benefit from the CDM.

The existing host country capacities should be utilised wherever possible. For example, existing capacity should be employed for the preparation of studies, reports, etc. The stronger involvement of local or national capacities would also lower transaction cost of the projects (information gathering, language barriers, etc.) and contribute to the sustainable development in the host country.

References

Adesol (1999) CURRICULUM INSTITUCIONAL, Tegucigalpa: Associacion para el Desarollo de las Energia Solar.

Adesol (1999) Leaflet ADESOL Honduras, Tegucigalpa: Associacion para el Desarollo de las Energia Solar.

Amin, A. (1999) Institutional barriers to commercialisation of wind power in India, the case of Gujarat, in Cicero Working Paper 1999:7, Oslo: Center for International Climate and Environmental Research (CICERO).

Baumert, Kevin (1998) The Clean Development Mechanism: Understanding Additionality. In: WRI, FIELD, CSDA (eds.) The Clean Development Mechanism. Draft Working Papers. Washington: WRI, pp. 23-31.

Begg et al. (1999) Accounting and Accreditation of Activities Implemented Jointly, Final Report , prepared for the European Commission under the Environment and Climate Programme 1994-1998.

Bhutan (1996) - ETC Netherlands, Sustainable Energy Team (1996) Joint Implementation Pilot Project Kilung-Chuu Micro-Hydel, Bhutan. Ex-ante report, unpublished.

Bromley, D. W. (1999) REFORMING OPERATIONAL PROCEDURES OF THE GLOBAL ENVIRONMENTAL FACILITY, http://www.gefweb.com.

BTG (1997) Methane Emission Reduction at Wastewater Treatment Plants in Coffee Mills, project proposal elaborated for the Joint Implementation program and presented to Oficina Costarricense de Implementacion Conjunta.

Bubenzer A. and A Räuber (1999) Umwelt und Effizienz. Übersicht über Ansätze zur energiewirtschaftlichen und ökologischen Gesamtbewertung von Photovoltaiksystemen, Workshop Photovoltaik in Energiewirtschaft und Industrie, Reisenburg 20./21.10.1999.

Carter, L. (1997) Modalities for the operationalisation of additionality in Proceeding, International AIJ Workshop Leipzig, 5-6 March 1997, Bonn: Federal Ministry for the Environment, Nature Protection and Nuclear Safety, p. 79-92.

DAC Expert Group on Aid Evaluation (1997) Evaluation of programs promoting participatory development and good governance, synthesis report, Paris: OECD, Development Assitance Comittee.

Dixon, R. (1999) The U.S. Initiative on Joint Implementation and the FCCC Activities Implemented Jointly Pilot Phase: Experiences and Lessons learned in CDM, Workshop on Baselines for CDM, Proceedings, February 25-26,1999,Tokyo.

Dixon, R. (1999) The UN Framework Convention on Climate Change. Activities Implemented Jointly (AIJ) Pilot: Experiences and Lessons Learned, Dordrecht: Kluwer.

EIA Energy Information Administration (1997) International Energy Annual 1997, http://www.eia.doe.gov/emeu/international/electric.html.

EIA Energy Information Administration (1999) Regional Indicators: Central America,http://www.eia.doe.gov/emeu/cabs/centam.html.

Enersol (1994) Solar-Based Rural Electrification in Honduras, a proposed Joint Implementation Project submitted to USIJI, Somerville: Enersol Associates, Inc.

Enersol (1996) Greenhouse gas monitoring and varification plan for the Solar-Based Rural Electrification in Honduras, Somerville: Enersol Associates, Inc.

Fankhauser, S. (1999) The GEF Incremental Cost Framework- Experience from Climate Change Projects, http://www.gefweb.com.

Flores, M.(1999) Personal Communication, Tegucigalpa, 1.9.1999.

Grubb, Michael and Christiaan Vrolijk, Duncan Brack (1999) The Kyoto Protocol: a guide and assessment, London: RIIA.

Harloff, R. (1999), Nations Energy Inc., Telephone Conversation, 5.6.1999.

Heister, J. and P. Karani, K. Poore, C. Sinha, R. Selrod (1999) The World Bank's Experience with the Activities Implemented Jointly Pilot Phase. In: Dixon R. K. The UN Framework Convention on Climate Change. Activities Implemented Jiontly (AIJ) Pilot: Experiences and Lessons Learned, Dordrecht: Kluwer, pp. 239-80.

Heller, Th. Ch. (1998) Additionality, Transactional Barriers and the Political Economy of Climate Change, in NOTA DI LAVORO, VOL 10.98, Fondazione Eni Enrico Mattei.

Hensen, A (1998) Greenhouse Gas Emissions from the Coffee Industry in Costa Rica, report commissioned by Directoraat Generaal Internationale Samenwerking (DGIS) of the Ministry of Foreign Affairs, The Hague.

Hongpeng, L. (1999) Case Study for Increment Cost Determination on China Renewable Development Project, http://www.gefweb.com.

Italian/ Dutch contribution to the discussion on baselines (1999) paper presented to the informal EU workshop on mechanisms and compliance, Vienna, 13-14 December 1999.

Jepma, C., R. Dixon and M. Eisma (1999) Overview of the UN FCCC Activities implemented jointly pilot: COP-1 decision 5, Reporting guidelines and case studies. In: Dixon, Robert, K., The UN Framework Convention on Climate Change. Activities Implemented Jointly (AIJ) Pilot: Experiences and Lessons Learned, Dordrecht: Kluwer, pp. 15-38.

Lima, R. (1999) Personal Communication, Tegucigalpa, 31.8.1999.

Luhmann, H.-J., H. E. Ott, C. Beuermann, M. Fischedick, P. Hennicke and L. Bakker (1997) Joint Implementation- Projektsimulation und Organisation, Operationalisierung eines neuen Instruments der internationalen Klimapolitik, Berlin: Umweltbundesamt.

Mendis, M. S. (1999) DEFINING BASELINES FOR CDM ENERGY PROJECTS in CDM Workshop: Workshop on Baselines for CDM, Proceeding, February 25-26,1999,Tokyo.

Michaelowa, A. (1999), Baseline methodologies for CDM - which road to take? Presentation at IGES, June 23,1999, unpublished.

Michaelowa, A. and E. Fages (1999) Options for Baselines of the Clean Development Mechanism, Mitigation and Adaptation Strategies, Vol. 4 (2), p.167-185.

MIDEPLAN Minisesterio de Planificacion Nacional y Politica Economica (1999) Sistema de Indicadores sobre Desarollo Sostensible, http://www.mideplan.go.cr/sides/.

Nielsen, Ch. (1999), Conversation, Tegucigalpa 31.8.99.

Nijs, J., R. Mertens, D. Hukin, and L. Frisson /1997) Energy Pay-Back Time of Cristalline Solar Modules, Advances in Solar Energy, ASES Vol. 11, 291.

Oberthür, S. and H. E. Ott (1999) The Kyoto Protocol: international climate policy for the 21st century, Berlin: Springer.

OECD Development Assistance Committee (1992) Guidelines on Aid and Environment, Paris: OECD.

Panayotou, Th. (1999) Six Questions of Design and Governance in Issues & Option: The Clean Development Mechanism, New York: UNDP, p. 45-51.

SBSTA Subsidiary Body on Science and Technology Advancement (1997), FCCC/SBSTA/1997/INF.3.

Secretaria de Recursos naturales y ambiente, Direccion general de energia (1997) Inventario de Proyectos de Inversion en el sector energetico de Honduras, Tegucigalpa.

SISCO The SIAM Iron and Steel Co (1999) Fax, 4.8.99.

Solar Electric Light (1999) Fax, 21.9.99.

URF BioGen Biomass Power Generation Project , Phase one (1997a), UN Secretariat of the FCCC, http://www.unfccc.de/program/aij/aijact/hndusa02.html.

URF BioGen Biomass Power Generation Project , Phase two (1997b), UN Secretariat of the FCCC, http://www.unfccc.de/program/aij/aijact/hndusa03.html.

URF Solar-Based Rural Electrification in Honduras (1997), UN Secretariat of FCCC, http://www.unfccc.de.

URF Aeroenergia S.A. Wind Facility (1997), UN Secreteriat of FCCC, http://www.unfccc.de.

URF Plantas Eolicas Wind Facility (1997), UN Secreteriat of FCCC, http://www.unfccc.de.

UNFCCC (1999) AIJ under the pilot phase, UN Secreteriat of FCCC, http://www.unfccc.de/program/aij/aijproj.html.

Verani, A., Nielsen, Ch., Covell, Ph. (1999) PV Powers Rural Communities in Solar Today, Vol May / June 1999.

Workshop (1999) Primear Comunicacion de Honduras a la CMNUCC, Taller Alternativas para la reduccion de las emisiones del sector energia, UNDP,GEF, Tegucigalpa,1.9.1999.

Worldbank (1999) Technical Report: Ilumex Verification Report, Washington: Worldbank, Report No. 99-3258.

Yamin, F. (1999) Operational and Institutional Challenges in Issues & Option: The Clean Development Mechanism, New York: UNDP, p. 53-79.

Zelaya, S. (1999) Conversation, Tegucigalpa, 31.8.99.

Zelaya, S. (1999a) Conversation, Tegucigalpa, 1.9.99.

Zepeda, Ch. (1999), Conversation, Tegucigalpa, 31.8.99.

Appendix-1:
An assessment of the Uniform Reporting Formats (URFs): Questions...

... regarding environmental additionality:

1. How is the project defined and which project boundary has been selected? Whether
- the direct impacts of the respective project on greenhouse gas emissions have been described in detail,
- all input variables that determine the amount of emissions of the project have been mentioned,
- the methods for how to measure these variables during the project lifetime have been given,

2. What is the reference case of the respective project? Whether
- the URF presentation clearly distinguishes between reference case and AIJ case,
- all input variables that determine the emissions of the reference case have been mentioned,
- all sources of data for specifying these variables have been given,
- the methodology of how to determine the baseline have been provided,
- alternative baselines have been discussed.

3. Do stated GHG emission reductions truly reflect the total GHG impact? Whether
- the URF contains a differentiation between measured and non-measured impacts,
- discussion of the proportion between measured and non-measured impacts,
- a trend for non-measured GHG impacts has been given (positive/negative/ambiguous,)
- description of which GHG impacts can be expected (beyond the direct impact) has been included,
- risks have been mentioned and discussed,
- detailed information on monitoring and verification plans have been provided.

4. Are barriers to the implementation of projects defined? Whether
- abatement costs have been given,
- methodology for calculating abatement costs have been provided,
- the URF contains information on the profitability of the investment,
- financial and other barriers that had to be overcome have been described,
- measures were taken to address barriers,
- costs to overcome barriers have been stated.

... regarding sustainable development

As mentioned, the project‘s contribution to ”sustainable development” was not included as criterion for AIJ pilot projects. However, relevant information may mainly be found in the URF sections (A) (especially the part: description of AIJ project activities) and (C) (compatibility with and supportiveness of national economic development and socio-economic and environment priorities and strategies). Section (C) of some reports, for example, asks for quantitative data. However, the formulation often suggests no/yes answers. Sources are often inaccessible. Furthermore, section (D) (environmental, social/cultural, and economic impacts of the AIJ project), and (G) (contribution to capacity building and technology transfer) include relevant information. Under section (H) few projects provide information on

negative impacts and/or effects encountered. As the reporting format is still evolving, project reports follow slightly differing structures depending on the time of submission.

However, the following issues have been addressed:

- Has the project been embedded in the country framework?
- Does a sustainable development strategy exists or is it adopted as national goal?
- Are social, environmental (non-GHG) and economic impacts described quantitatively?
- Are indicators (economic, social, and environmental) proposed?
- Is a regular monitoring of impacts/indicators envisaged?
- Does the URF contain hints on an external quantitative assessment of the impact?
- Does the URF provide information on sources and on the entity who did the assessment?
- Who are the stakeholders? e.g. local population, government institutions/bodies, research, NGOs, etc.
- Have the stakeholders participated during project planning /implementation phase?
- Which kind of participation procedure, e.g. hearings etc., was employed?

Appendix-2: Information access and transparency

Access to the URF and other published material on AIJ projects was easy. Matters became worse, the more detailed the information required. Furthermore, low transparency proved a major obstacle not the least given the short project duration. The subsequent examples regarding the attempts to contact official governmental bodies and project developers may give an impression. In addition, some general experiences with the project visits are described. Names and positions, however, are treated confidentially.

Approaching governmental bodies

USIJI: The first approaches to USIJI were undertaken in May 1999. Via telephone the project was described and the official USIJI reports on five projects in Central America were requested. A second attempt was undertaken shortly thereafter. Then senior staff, who is according to the staff list responsible for the project proposals was informed about the Wuppertal Institutes project. Again there was no response. Further contacts via e-mail led to the reply: „I am working on a response". In a visit to USIJI, matters became obvious. The senior person is the only qualified staff member; however, the workload exceeds by far what a single person can sensibly handle. The visit was the only chance to obtain official USIJI publications. Yet, these publications are mainly compilations of Uniform Reporting Formats.

Norway: Official UN secretariat material names a person within the Ministry of Foreign Affairs as the contact person (UNFCCC 1999). The mentioned telephone number is correct. Nevertheless, there is only a Norwegian speaking answering machine. Various messages in English were left, but there was no response at all. In September, the Wuppertal Institute received a letter from the Ministry of Foreign Affairs of Norway, that referred to the questionnaire the WI had send in early August. Therein the Wuppertal Institute is advised to contact the World Bank. No other information was included in the letter.

Netherlands: The Netherlands proved rather co-operative. Firstly in May, senior staff from the Ministry of Housing, Spatial Planning, and the Environment, was contacted. Promptly, unpublished background material was sent. After a second attempt staff from the Dutch Ministry of Foreign affairs disclosed a helpful list of telephone numbers and sent the baseline confirmation study on the Coffee Mills project in Costa Rica (Hensen 1998).

Burkina Faso: High ranking senior staff from the Ministry of Environment is named as contact person in official UN documents. Though approached by fax, E-mail and telephone no contact could be established. After speaking to World Bank representatives it became apparent that someone else within the Department of Energy is in charge of the AIJ project in Burkina Faso. The officially reported senior staff is occupied with many environmental activities in Burkina Faso and, therefore, difficult to reach.

Honduras: To prepare the site visits the Wuppertal Institute tried to contact official institutions in Honduras in July. Officially disseminated telephone numbers did not work. Deutsche Telekom was unable to identify telephone numbers of Honduran Ministries.

Contacting the Honduran „Telecom“ resulted in four numbers that all did not reach through. Eventually, by chance, senior staff was contacted, who proved to be the key person in the development of AIJ projects in Honduras.

Costa Rica: The Costa Rican Office for Joint Implementation (OCIC) could be reached straightforwardly, and it proved very helpful.

Approaching project developers

The Bio-Gen Biomass Power Generation Project Honduras:
Nations Energy Corporation is the actual investor of the project. The Wuppertal Institute spoke to key persons. It was explained that the project is on hold due to hurricane Mitch. Nations Energy was interested in whether the WI wanted to buy the Bio-Gen Project. Before disclosing any further information, the Wuppertal Institute had to fill in a confidentiality agreement. Although the WI simulated to be a potential buyer, no access to information could be gained. The second company involved in project development was International Utility Efficiency. To approach the person in charge proved impossible.

Plantas Eolicas Wind Facility Costa Rica:
The project was developed and set up by Charter Oak Energy Inc. In official UN-documents Charter Oak Energy occurs as project developer (URF Plantas Eolicas 1997). But the project was sold and is now in possession of Illinova Generating Company. The responsible employee declared himself quite annoyed, as he was promised the opportunity to realise credits for the emission reductions. In addition, he expressed the feeling to be unduly observed. Obviously, there had been calls by researchers from China, USA and elsewhere, who wanted to learn about CDM. But he is not going to support any „doctoral studies“, no information will be made available, he won’t spend a second on sending what he has got.

Aeroenergia Wind Facility Project Costa Rica:
The Uniform Reporting Format states one contact person (URF Aeroenergia 1997).When dialling the provided telephone number the WI was informed that it would talk to a surgery . Nobody in this surgery knew anything of AIJ. Unfortunately, there was no opportunity to speak to the Doctor himself, however from his staff the WI obtained a telephone and fax number of the doctors brother, who is the person actually involved in AIJ project design. In mid July this brother received a fax but he never replied.

Tierras Morenas Windfarm Project Costa Rica:
There was no chance to reach an English speaking person.

Dona Julia, Hydroelectric Project Costa Rica:
The project developers could be approached directly. A fax was sent to the project manager in June 1999, which resulted in a quick response fax .

Burkina Faso Sustainable Energy Management Project:
Approaching the two listed contact persons in Norway and Burkina Faso proved very difficult. As the project is done under World Bank guidance the World Bank was contacted. The person in charge there offered assistance, generally project coverage is very good.

Solar Based Rural Electrification Project in Honduras:
Approaching the American project developers, Enersol Associates, proved straightforward.

Visiting projects

Honduran JI office:
Just during the visit, preparations for a JI office had matured and where about to result in setting up an JI office. The senior person contacted hoped to become the head of this office, as he had invested much effort in the feasibility study. Shortly after the visit the office was inaugurated. Concerning the Honduran JI office Canada was mentioned as a potential sponsor. In a talk to a representative of a Canadian development project the sponsoring turned out to be strategically motivated. Canada is apparently considering to turn various ongoing sink-projects into AIJ/CDM projects.

Bio-Gen Biomass Power Generation Project in Honduras:
The Bio-Gen biomass power generation project is pending for 12 months now. After the withdrawal of Nations Energy the office of the joint venture between Lima and Nations Energy closed. The conversation with the Honduran project developers (father and son) took place in a hotel. The personal impression of the traveller of the WI is that the senior, who had initiated the project, acts very cautiously, whereas his son gave the impression of being a bit pompous. Presumably, the project had grown bigger - possibly he was pushed by his son - than the senior ever wanted it to be. There was no chance to investigate a consistent explanation for the delay of the project. Concerning AIJ the two Hondurans only knew that it was about selling tons of carbon dioxide. All reporting to USIJI was done by Nations Energy. When showing the URF of the Bio-Gen project, the senior appeared very surprised to see his name and address. He had never before heard of the URF and the UN secretariat. It should also be noted that concerning the Bio-Gen project the Honduran project developers appeared very enthusiastic. It was stressed various times that the project offered an excellent proportion between investment costs (58 Mio. US$) and the anticipated gains (roughly 50 mio. US$) when selling the credits at ten US$ the ton carbon dioxide equivalent. No one ever mentioned an existing arrangement how the credits would be shared amongst the investors. On the contrary it was vaguely uttered that Honduras might insist on a significant proportion of the credits.

Solar-based Rural Electrification Project in Honduras:
The Adesol office is located in the centre of Tegucigalpa. The project visit was confined to visiting the Adesol office, although a trip into villages, where SHS had been installed, was planned. Unfortunately, the trip could not be realised as bad weather conditions would have extended the travel time to more than 3 hours each way. After hurricane Mitch many destroyed roads in the Tegucigalpa area are replaced by non-concrete bypasses, that during rainy season prove a major impediment. Apart from this the Adesol staff proved very helpful and co-operative.
High Efficiency Street Illumination:
This Dutch AIJ project had not been implemented, although it is still included in the official UN secretariats list. No explanation for the non-implementation could be investigated (Workshop 1999, Flores 1999).

Costa Rican Office for Joint Implementation (OCIC):

Our senior contact person appeared very frustrated about the future of his office. According to him, OCIC depends on financial resources that it raises itself and on the support of the government. However, with the slow progress of climate change negotiation OCIC is in danger to loose both. To compensate partly for the loss in turnover OCIC offers consultancy expertise to other Latin American countries. Additionally, his frustration is increased by the fact that so many come to Costa Rica to study its effort without contributing in any visible way to Costa Rican attempts to push AIJ/CDM.

Methane Emissions Reductions at Waste Water Treatment Plants in Coffee Mills:

One of the four coffee mills is very close to San Jose and, therefore, was chosen for the site visit. The OCIC contact person had offered his company, but he had already pointed out that there was no one, who could explain details of the AIJ component. This component was exclusively done by a Dutch consultant who had left the country after the project was finished. So our OCIC contact person is the one in Costa Rica who knows most about the matter. Indeed, he disclosed information and reports that could not be obtained from the Dutch Ministry. The envisaged site visit to the Heredia coffee mill could not be arranged as the contact person had to leave this particular day for a burial.

Aeroenergia Wind Farm:

The Aeroenergia wind farm is about four hours away of San Jose, which is why a visit to the actual wind farms was not undertaken. Unfortunately, the OCIC contact person could not arrange a talk to the Aeroenergia project developers. He declared that the Aeroenergia project was an almost completely Costa Rican project and implicitly confirmed that the US-partners merely existed to obtain USIJI inclusion [A-1].

Plantas Eolicas:

The OCIC contact affirmed that Plantas Eolicas was a project that had taught him lessons. More specifically, he exclaimed that this project is in possession of American investors, who had used AIJ as a vehicle to receive a preferential loan by the Interamerican Development Bank.

[A-1] This sheds a different light on the difficulties when approaching the officially reported project developers.