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FINAL REPORT

EXTERNAL EVALUATION OF THE CONCURRENT PHASE OF RETA 5592: A STUDY OF LEAST-COST GREENHOUSE GAS ABATEMENT STRATEGY (ALGAS PROJECT)

by

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FOREWORD

The Asian Development Bank (ADB) Board of Directors approved of a study of a Least-cost Greenhouse Abatement Strategy for Asia (the ALGAS Project) on 2. August 1994.

The overall objective of the study is to enhance the existing national and regional capacity to develop least-cost greenhouse abatement strategies that promote environmentally sustainable economic development in twelve countries, namely: Bangladesh, Democratic People's Republic of Korea (DPRK), India, Indonesia, Mongolia, Myanmar, Pakistan, People's Republic of China (PRC), The Philippines, Republic of Korea (ROK), Thailand and Viet Nam.

ADB has decided that an external evaluation of the ALGAS project shall be carried out in two phases. The first was planned to be concurrently with the project (July-November 1997), and the second, after completion of the component executed by the ADB (i.e. excluding the study for DPRK) (January-March 1998). However, delayed project completion relative to the originally anticipated time schedule of reviewed versions of the final country reports, has led the ADB to request the evaluation submitted later and in two volumes; one covering the concurrent phase in July of 1999, and the second covering the post-evaluation phase, to be submitted once the said reports have been made available to the evaluator .

The evaluation task has been assigned to the Norwegian economist Stein Hansen.

The terms of reference (t.o.r) for the external evaluation of the concurrent phase is twofold. First, to evaluate the implementation of the capacity building activities of the project, in particular, the training workshops, and second to evaluate the extent to which country-level human and institutional capacity has been developed under the project in respect of (a) preparation of national GHG inventories by the IPCC methodology, (b) analytical/modelling capabilities for development of least-cost strategies for GHG abatement, and (c) analysis of GHG abatement of options and preparation of project pre-feasibility documents. It is this phase of the evaluation which is covered in this volume.

The t.o.r. for the post evaluation phase is first to evaluate the extent to which the project outputs by the country teams are likely to be useful to the Governments in the preparation of their National Communications to the United Nations Framework Convention on climate Change (UNFCCC). Second, it is to evaluate the extent to which the project outputs by the country teams, in particular the project pre-feasibility documents, are likely to be useful to multilateral development banks (MDBs), other donors, and the private sector in planning investments in GHG abatement projects.

Third, to evaluate the extent to which the human and institutional capacities built up by the project constitute a self-sustaining critical mass, capable of providing support to Governments in respect of their UNFCCC commitments. Finally, to evaluate the usefulness and durability of the regional linkages forged under the project. This part of the evaluation will be presented in a separate follow up volume.

The candid response to a series of evaluation questions and inquiries by UNDP-staff, ADB's ALGAS-Project staff, ALGAS-ITEs, -NTEs and NCA-representatives has proven essential to the analysis and conclusions of this evaluation. Their assistance is highly appreciated. Needless to say, all conclusions are the sole responsibility of the author.

Bekkestua, Norway
July 1999

Stein Hansen

ACRONYMS

ABARE:	Australian Bureau for Agricultural Resource Econmics
ADB:	Asian Development Bank
AED:	Alternative Energy Development, inc.
AIT:	Asia Institute of Technology
ALGAS:	Asia Least-Cost Greenhouse Gas Abatement Strategy
APRB:	ALGAS Project Review Board
BTOR:	Back to Office Report
CERI:	Cost of Emission Reduction Initiative
COMAP:	Forestry sector model for estimating impacts of mitigation options
COP:	Conference of the parties (to the Climat Convention)
COPATH:	Model for carbon accounting in the forestry sector
DFR:	Draft Final Report
DPRK:	Democratic People's Republic of Korea
EA:	Enabling Activity
ESCAP:	Economic and Social Commission for Asia and the Pacific
EFOM/ENV:	Energy-Environmental Optimization Model
GEF:	Global Enviroment Facility
GHG:	Greenhouse Gas
IPCC:	Intergovernmental Panel on Climate Change
IRP:	Independent Review Panel
IRRI:	International Rice Research Institute
ITE:	International Technical Expert
KEEI:	Korea Energy Economics Institute
LBL:	Lawrence Berkeley Laboratory
LEAP:	Energy Accounting Model for making long-term alternative scenarios
MARKAL:	Multi-period energy sector linear programming optimization model
MDB:	Multilateral Development Bank
MEDEE-S:	Model for energy demand evaluation
MUSS:	A user interface programme
NCA:	National Counterpart Agency
NTE:	National Technical Expert
OESD:	ADB's Office of the Environment and Social Development
PAIs:	Project Administrative Instructions
PPER:	Programme Performance Evaluation Report
PPRR:	Principle Residence Representative
PRC:	People's Republic of China
RBAP:	Regional Bureau for Asia and the Pacific

RETA:	Regional Technical Assistance
RPC:	Regional Project Coordinator
ROK:	Republic of Korea
TA:	Technical Assistance
TL:	Team Leader
UNDP:	United Nations Development Programme
UNEP:	United Nations Environment Programme
UNFCCC:	United Nations Framework Convention on Climate Change
USCPS:	U.S.Country Studies Programme
USEPA:	U.S.Environment Protection Agency
YER:	Year End Report

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EXECUTIVE SUMMARY OF FINDINGS AND CONCLUSIONS

The Asia Least-Cost Greenhouse Gas Abatement Strategy (ALGAS) is aimed at enhancing existing national and regional capabilities to develop least-cost greenhouse gas abatement strategies that promote environmentally sustainable economic development in 12 Asian countries. The specific objectives of the Project are as follows:

* Develop and improve national and regional capacities to prepare inventories of greenhouse gas (GHG) emissions and sinks to meet the reporting requirements of the UNFCCC.
* Develop national and regional capacities to identify, formulate, and analyze GHG abatement options for participating Asian countries, and
* Develop and implement strategies on national least-cost GHG abatement by preparing national mitigation plans and a portfolio of viable investment projects that dovetail with the countries development priorities.

1. SCOPE OF THE EVALUATION

During the Third Meeting of the ALGAS Project Review Board (APRB) held in Manila in February 1997, it was agreed that it is essential to undertake an evaluation of the project. The external evaluation was to be carried out in two phases. The first concurrently with the project, and the second (the post-evaluation phase), after completion of the component executed by the ADB (i.e. excluding the study for DPRK). This report volume deals with the concurrent phase .

The Terms of Reference (ToR) for the external evaluation of the concurrent phase is twofold; First to evaluate the implementation of the capacity building activities of the project, in particular, the following aspects of training workshops:

1a. Relevance and extent of coverage in relation to project objectives,

1b. Quality and usefulness of training materials prepared,

1c. Benefits perceived by country participants,

1d. Cost-effectiveness, and

1e. Reliance on regional institutions/resource persons and promotion of regional cooperation.

Second, to evaluate the extent to which country-level human and institutional capacity has been developed under the project in respect of:

2a. Preparation of national GHG-inventories by the IPCC methodology,

2b. Analytical/modelling capabilities for development of least-cost strategies for GHG abatement, and

2c. Analysis of GHG abatement of options and preparation of project pre-feasibility documents.

2. EVALUATION APPROACH

This evaluation is undertaken primarily as a desk study of the wealth of written ALGAS-documentation in the form of workshop compendia, interim and progress reports, project status reports (PPERs), back to office reports (BTORs), Year End Reports (YERs) from all involved personnel (NTEs, ITEs, ADB-staff), completed workshop evaluation forms, as well as field visit reports from various project participants.

This has been supplemented by the evaluator with communications-based (e-mail and fax) interviews in the form of tailormade TOR-based questionaires sent out to all NTEs, ITEs, NCAs, the RPC and ADB-staff. In addition, during visits to Manila and participation in the final workshop, the evaluator has personally followed up on these questionaires and the answers (or in some cases; lack of answers) to them in the form of interviews with the above categories of persons as well as UNDP's GEF responsible officer from New York who was available to meet the evaluator while visiting Manila. The evaluator also met at the same time with GEF staff and other aid agency representatives involved in complementary projects. These interviews have been followed up with more detailed e-mail communication in order to cross-check and seek second opinions where there are divergent opinions on issues of relevance to the evaluation. In this way, it is hoped that the results are based on unbiased observations.

As regards the quality and usefulness of the written material supplied by the Consultants, the evaluator has reviewed available compendia prepared for the different workshops from the perspective of the ALGAS TOR as a basis for the judgement along with the BTORs from the various ALGAS participants.

3. IMPLEMENTATION OF THE CAPACITY BUILDING ACTIVITIES

3.1. Relevance and Extent of Coverage of the Training Workshops

The evaluation analysis of the various ALGAS reports and interviews carried out in the context of this evaluation conclude that the relevance and extent of coverage was by and large satisfactory for all the Regional-, Sub-Regional and National Training Workshops, and that the various workshop objectives listed have been substantially achieved as intended . It is the assessment of this evaluator that the workshop programs and the accompanying training materials have been carefully designed and prepared so as to be highly relevant, applicable, hands-on oriented and user-friendly and because of their complementarity and interdependency providing a broad and comprehensive coverage as regards the ALGAS objectives.

The sub-regional- and national model-, measurement- and inventory training workshops were a derived need from the regional workshops, and as such tailormade to the requests for more hands-on applicable training in order to meet the ALGAS objectives. As such they have proven valuable in terms of relevance as well as extent of coverage.

The evaluator would also like to remark that a major contribution to this overall favourable assessment is the approach adopted whereby the original project document scope of a rather uniform model package training approach to all participating countries, was replaced with a country specific approach whereby the individual training needs of each country was identified and individual training programs were designed and implemented for each country.

3.2. Quality and Usefulness of Training Materials Prepared

The NTEs and NCAs reported that by and large the training materials recieved were very useful and in most cases simple enough for the local researchers to utilize; in fact, in some cases so simple and non-specific so that local researchers took the initiative to modify the methodology to suit local conditions.

The overall conclusion is, therefore, that the training materials were well designed and of practical use to the participants, and the country-specific orientation of the training based on it was appreciated and added to the usefulness of the material.

3.3. Benefits Perceived by Country Participants

The NCA-feedback is that benefits were significant and helped the countries considerably in their preparation for the UNFCCC communication. It was reported that those who did attend the workshops found them to be of great learning value, and the level of attendance from concerned Government agencies and Ministries as well as NGOs was very satisfactory in most of the cases.

The general NTE feedback on usefulness of the workshops and the TA missions is very favourable. This applies to all three categories of workshops and the training materials prepared. Such responses have been received from all categories of ALGAS actors; participating governments, donor agencies and professional researchers in the field. The following listing and discussion of some administrative shortcomings in the first project-year do not in any way alter this favourable conclusion .

3.4. Cost-Effectiveness

Being the biggest and most complex ADB Regional TA so far, project organization and actions taken by the actors as a means to timely and cost-effective implementation is of particular importance. The following events and start-up actions related to project organization and execution were reported by various ALGAS actors as having contributed to making an already complex project structure no less complex to manage during the early stages:

(a) Staff replacements at the key ALGAS posts at ADB and UNDP at the hectic and critical time of organizing this complex multicountry project meant that important ALGAS-related institutional memory had to be transferred to newly hired senior staff members with a limited time overlap between the new and the old project officers in the two institutions.

(b) Initially establishing an organizational model with 3 positions (i.e. the RPC, the ITE-team leader, and ADBs project officer) that could appear to "outsiders" (i.e. NCAs and NTEs) as 3 competing project leaders provided for possible confusion as regards lines of command and control and of communications. The majority of the ALGAS actors have reported that the project progressed much more smoothly once the RPC-position was removed and clear lines of command and communications established.

(c) After the ITE Prime Consultant (AED) and its team was contracted to start work, they were at the same time engaged in lengthy contract variation negotiations with ADB and faced difficulties in retaining the originally proposed ITE-experts for the assigned field missions and workshops.

Overall, however, these early incidences did not in any substantive way impact adversely on the eventual project outcomes.

The original project document prepared by UNDP-GEF, specified 3 years as the duration of the project. The substantive commencement of the project was in June 1995 (with the Approach and Methodology Workshop). By June 1998, all countries were to have submitted their Final Country Reports duly reviewed thrice by the ITEs, and twice by the external reviewers, and the Governments, but as of late June 1999 this external evaluator had yet to receive them for review. All in all, the project overall – dispite significant enhanced capacity building activities relative to the original project, and despite the said organizational complications in the early project phases – will be essentially completed with only modest extension of the originally envisaged 3 year time frame from substantive startup.

The following additional factors should taken into consideration when assessing the actual rate of progress:

a. The delayed start-up in Myanmar , Republic of Korea and Mongolia due to problems internal to the NCAs;
b. Large program of additional capacity building activities formulated during project implementation as the needs of the countries became apparent; and
c. Two rounds of external peer review of the country reports, not contemplated in the original project document.

Considering the novelty, complexity and comprehensiveness of this innovative project, the overall score on this dimension must be deemed satisfactory.

3.5. Reliance on Regional ITEs and Promotion of Regional Cooperation

While it would not be feasible to include formal networking in each and every project activity, the project-specific formal regional networking and active use of regional expertice of the ALGAS project gradually developed to a significant activity, as seen from the list below:

a. Inclusion of NTEs in the ITEs team;
b. Reliance on regional institutions (e.g. ABARE, IRRI, NPL, IIS, AIT, etc) for capacity building activities;
c. Regional databases;
d. Regional thematic support group of experts;
e. ALGAS website;
f. Study tours;

g. ALGAS newsletter;
h. Coordinated program for empirical measurement of methane from rice paddies.

Significant involvement of and reliance on Regional ITEs for workshops and TA-missions was an active effort undertaken by the project. As an illustration, the Methane Measurement Workshop which was organized by IRRI, relied on regional ITEs and regional institutions and thus promoted regional cooperation.

4. DEVELOPMENT OF IN-COUNTRY HUMAN AND INSTITUTIONAL CAPACITY BUILDING

4.1. Overall Assessment

A good question to ask at this stage is whether these national human and institutional resources will be sustained. It would seem that this is only possible if the same team members continue to work on mitigation analysis in the future. And that depends on whether each country sees a need to develop mitigation plans. Under the Climate Change Convention, little is needed for mitigation except to propose steps that a developing country will undertake for climate change abatement. If these steps have to be converted into an action plan, then the capacity and capability created will be used. Otherwise they will lose the expertise through attrition or lack of practice.

4.2. Development of GHG Inventories by the IPCC Methodology

The NCA- as well as the NTE- and ITE-responses are that for the most part, country level human and institutional development of capacity and capability to do national GHG inventories by the IPCC methodology has taken place as aimed at as a consequence of the ALGAS project. As a result, GHG inventorying in the future can be done on a regular basis by the relevant Government agencies.

This human- and institutional capacity has been developed to the extent where some countries have been able to suggest model modifications to IPCC coefficients to be more reflective of their national situations. However, in other cases, the various coefficients have often been taken from other countries' reports or from the international literature, i.e. "the IPCC Guidelines for National GHG Inventories". This furnishes the prescribed methodology of the UNFCCC, as also of ALGAS inventory preparation. Many of the participating countries had only preliminary national GHG inventories at the start of the ALGAS project.

The ALGAS training in inventories preparation fully meets the standards expected of National Communications under the UNFCCC. As a result of the project assistance, which included a number of training workshops and seminars as well as ITE assistance, most of the ALGAS national country teams have been able to assemble their national inventories. More importantly, the countries have now established the national institutional framework to conduct subsequent updates of their GHG inventories.

4.3. Development of Analytical/Modeling Capabilities

The degree to which analytical/modeling capabilities for development of least-cost GHG abatement strategies have been developed in the participating countries varies considerably. The primary reason is the fact that these capabilities are difficult to develop, should build on existing capabilities and are very dependent on availability of basically qualified personnel. Additionally, the availability of a good data base is also essential. What can be stated is that all countries have improved their analytical and modeling capabilities significantly as a result of the ALGAS Project.

Because of the various training activities under ALGAS and complementary bilateral projects, virtually every ALGAS country has at least one team that can do a complete mitigation analysis using either MARKAL or EFOM for the energy sector, and the COMAP models for the forestry sector. In addition, every team should now have the capability to identify CC-mitigation projects of which GEF concepts are a subset, and these concepts would need further development into GEF-eligible format.

4.4. Analysis of GHG Abatement Options and Preparation of Project Documents

Based on the earlier referred BTORs from the ITE-TA missions and the BTORs from the NTEs workshop participation, the ALGAS Project appears to have been successful in helping to improve human and institutional capacity for assessing GHG abatement options and identifying project opportunities in most of the participating countries. This is also true with regard to improving the capacity of the countries to prepare project pre-feasibility documents. However, and this is undepinned in the questionaire responses from the NCAs to this evaluation, the degree of this capacity varies among the ALGAS countries primarily because it is a difficult skill which requires a multi-disciplinary approach. As a result, the quality of initial project pre-feasibility documents produced by the ALGAS project vary considerably. In most cases, this variation is due to the variation in general pre-ALGAS capabilities and experience of the author of the project document more so than the level of training received. Thus the project portfolios of most countries consist of both well-prepared and less well-prepared initial project documents. A significant improvement in the final project documents is expected to result from the extensive ITE- and external peer review

process that has now been instituted for the ALGAS country reports. The extent to which such achievements materialize will be investigated in the post-evaluation volume.

LOGICAL FRAMEWORK FOR ALGAS EVALUATION; CONCURRENT PHASE

ALGAS activity	ALGAS objectives	ALGAS outputs	Goals achievements based on BTORs and interviews
Regional workshop on HG inventories, New Dehli, Nov. 95	1. To train NTEs in IPCC methodology 2. To compile information on region/country specific emission coefficients 3. To assess needs of further capacity building	1. Task A reports received and reviewed. 2. Regional GHGs Manual prepared. 3. Training materials prepared by ITEs and handed out to NTEs. 4. Workshop on CH4 emissions from rice paddies held; in-country TA provided. 5. National workshops conducted.	Objectives have been substantially achieved: a. Relevance and extent of coverage was by and large satisfactory. b. Training materials were considered good and useful. c. Favourable feedback on perceived benefits by NCAs and for the most part also from the NTEs. d. Cost -effectiveness acceptable e. Only limited promotion of regional cooperation and communication took place . f. Set of regional experts were identified for capacity building during and after project completion in order to sustain the impact of the project.
Regional workshop on GHG abatement, Bangkok, March 96	1. To train NTEs/NCAs in concepts and methods of analysis of GHG abatement options; formulation of least-cost strategies, computation of incremental costs 2. Identification of further capacity building needs 3. Enhance awareness in NCAs of GHGs abatement analysis and options	1. Country outputs submitted, reviewed. 2. Training materials prepared by ITEs and handed out to NTEs. 3. Workshops for MARKAL,MEDEE/EFOM, COPATH/COMAP. project pre-feasibility, CH4 from landfills identified and conducted; TA missions conducted. 4. National workshops conducted.	1. As regards goal achievement in efficient and cost.-effective implementation of capacity building activities, this workshop generally achieved its goals along the first five dimensions listed in the evaluation terms of reference, but did not obtain as much regional cooperation and networking as some had expected. 2. The requisite capacity building was achieved through substantial

			enhancement of original training plan. 3. Regional experts were identified for TA. 4. It contributed to IPCC research to clarify costs/incremental cost concepts.
(sub)regional workshop on CH4 from rice paddies, Beijing & Bangkok, Sept./Oct. 96	1. Develop expertise among NTEs in empirical measurements of CH4 from rice paddies; techniques of extra/intra-polation of empirical data.	1. Country outputs submitted and reviewed. 2. In-country TA provided as per request 3. Cooperative methane campaigns to update inventories and feed into IPCC process. 4. Relevant equipment (e.g. gas chromographs) supplied to NTEs.	1. As regards implementation of the capacitity building activities, and even for promoting regional cooperation, the goals have been substantially met. 2. Regional experts were identified for further assistance within the project.
Regional workshop on MARKAL modeling at ABARE, Canberra, Nov. 96	1. Train NTEs of countries opting for this model in structure, country parametrization, runs, and interpretation of MARKAL	1. Country outputs submitted/ reviewed. 2. In-country TA as per request given.	1. As regards both the implementation of the capacity building activities, as well as capacity building itself the aspects listed in the ToR for this evaluation have been achieved within the means of the project, but it must be understood that MARKAL requires more practice than what was budgetted for in ALGAS. 2. All countries opting for MARKAL have used the model for the country studies. 3. Regional expertise identified for further TA activities
Regional workshop on MEDEE/EFOM at AIT, Bangkok, Oct. 96	1. Train NTEs from countries opting for this model in structure, country parametrization, runs, and interpretation of MEDEE/EFOM	1. Country outputs submitted/ reviewed. 2. In-country TA as per request given.	1. Satisfactory goals achievement as regards the implementation of the capacity building activities, except regional coooperation. 2. Mongolia and Pakistan have had some difficulties running the model but further TA should have remedied that.

			3. Regional TA at AIT, Bangkok was used for this project component.
Regional workshop on COMAP/COPATH modeling (forestry and land use), Bangalore, Sept. 96	1. Train NTEs in structure, parametrization,running and of CPOATH/COMAP models	1. Country outputs received, reviewed. 2. In-country TA provided as per request.	1. Both the implementation and the technical aspects of this workshop was successfully completed. The participating countries have successfully used the models. 2. Regional expertise was used for training, and incountry TA.
Sponsorship of NTEs to regional workshops on utlization of CH4 emissions from landfills conducted by USEPA, UN, Thailand, Nov. 96	1. Train NTEs in project formulation of CH4 emissions from landfills 2. Enhance awareness in NCAs of these abatement options.	1. As above	1. Judging from the BTORs, the various goals have been achieved in a cost-effective manner
Regional workshop on project development, Manila, Feb. 97	1. Train NTEs in developing project profiles on GHG abatement, develop awareness in NCAs	1. As above	1. Goals were substantially achieved. Some project profiles were presented.
National workshops in the ALGAS participating countries	1. To provide in-country capacity building/outreach to policy makers including feedback and policy guidance	1. National workshops have been conducted	1. Objectives substantially achieved.
Study tours and TA-visits from ITEs	1. Provide NTEs with enhanced knowledge on advanced technologies in GHG reduction/enhance-ment of sinks	BTORs have been submitted	1. Objectives substantially achieved.
The ALGAS Report	Provide communication, information and awareness of ALGAS project development and progress	1. It is published and circulated quarterly as scheduled	1. Objective substantially achieved
ALGAS Kyoto UNFCCC Conference presentation, Dec. 97	Present the ALGAS project from A to Z, including identified proposed TAs and investments to the UNFCCC Conference in Kyoto for purpose of awareness raising about the project	Carefully prepared country presentations of scope, results and proposals from each participating country compiled in a colorful and easy-to-understand booklet	1. Objective substantially achieved

LOGICAL FRAMEWORK FOR ALGAS EVALUATION; HUMAN AND INSTITUTIONAL DEVELOPMENT ACHIEVEMENTS

ALGAS activity	Objective	Achievement
Preparation of national GHG inventories by IPCC methodology	Human and institutional capacity and capability development to carry out said activity on a routine basis	1. Must be judged relative to that there is a limit to how much can be achieved in three years when prior training and working experience in these fields is minimal and varies substantially between the ALGAs countries.
		2. Achieved a noticable and measurable increase in the NTEs understanding of the subject. While inventories have been produced, their reliability varies between the countries, and the question of whether established capacity developed under the project can be sustained is an open one. Attricion and lack of opportunity to practice are the main threats.
		3. As of now, it is believed that each country has a team that could continue the task of updating and refining the inventories
Development of analytical modeling capabilities for making least-cost strategies for GHG abatement	Provide such capacity and capability in the ALGAS countries	1. In some countries this goal has been met in an impressive way, but in other countries there is still some way to go. However, inmost cases there is at least one national team that can complete a mitigation analysis using MARKAL or EFOM for the energy sector and the COMAP models for the forestry sector, and that is impressive.
		2. However, not all the countries will be able to take advantage of this capability and produce coherent national least-cost abatement strategies. More time and budget would have been needed.
		3. Where goals are still missing appears to be the strengthening

		of the NCAs.
Analysis of GHG abatement options and preparations of project pre-feasibility documents	As above	1. While capacity and capability to prepare project pre-feasibility documents has been greatly enhanced, the quality of such documents still varies substantially between the ALGAS countries.

PART I:

INTRODUCTION AND BACKGROUND

1. PROJECT SCOPE AND SETTING

The Asian Development Bank (ADB) Board of Directors approved of a study of a Least-cost Greenhouse Abatement Strategy for Asia (the ALGAS Project) on 2. August 1994. The overall objective of the study is to enhance the existing national and regional capacity to develop least-cost greenhouse abatement strategies that promote environmentally sustainable economic development in twelve countries, namely: Bangladesh, Democratic People's Republic of Korea (DPRK), India, Indonesia, Mongolia, Myanmar, Pakistan, People's Republic of China (PRC), The Philippines, Republic of Korea (ROK), Thailand and Viet Nam. The focus of the study is as follows:

a. To help participating countries prepare their national inventories of greenhouse gases (GHGs) and sinks to meet their reporting commitments under the Climate Change convention.
b. To develop national and regional capacities to identify, formulate and analyze GHG abatement options for several Asian countries.
c. To develop national and regional least-cost GHG abatement strategies through the preparation of national mitigation plans. and
d. To prepare for each country a pipeline of viable, least-cost GHG abatement projects that will dovetail with the countries' economic development strategies, and submit these for consideration for further funding from the GEF and other agencies.

The project is the biggest technical assistance (TA) project ever implemented by ADB. It is co-financed by ADB and the GEF through UNDP on a grant basis in the amounts of $ 592,000 and $8,137,000 respectively. The GEF/UNDP funding is being administered by ADB. Furthermore, Governments of participating countries contribute $ 1,296,000, and the Government of Norway has contributed $ 50,000 for the external evaluation of the project.

The Alternative Energy Development, Inc (AED), USA, was contracted by ADB for the role of ITE-leadership with a Malaysian national as Team Leader. They linked up with IFC Kaiser, Inc., and Lawrence Berkeley Laboratory (LBL) -- both of them USA-based -- and a series of regionally based institutions to provide the services of the international technical experts (ITEs) of the project; The Pakistan Branch of Hagler Bailly, Inc. , the Australian Bureau for Resources Economics (ABARE), the Asian Institute of Technology (AIT), Thailand, the Indian National Physical Laboratory (NPL), the Indian Institute of Science (IISc), the Bangladesh University of Engineering and Technology (BUET), and the International Rice Research Institute (IRRI), Philippines. Thus the bulk of the ITE-manmonths provided met the ALGAS goal of being of regional origin.

Each of the above-listed twelve participating countries has a national counterpart agency (NCA) and a team of national experts (NTEs) to carry out the study. The Democratic People's Republic of Korea (DPRK) is not a member of ADB. Therefore, ADB has subcontracted the TA implementation in DPRK to ESCAP in Bangkok.

2. THE MANDATE FOR THE EXTERNAL EVALUATION

During the Third Meeting of the ALGAS Project Reveiw Board (APRB) held in Manila in February 1997, it was agreed that it is essential to undertake an evaluation of the project. The external evaluation was to be carried out in two phases. The first was scheduled to be concurrently with the project, and is the focus of this volume. The second, a post evaluation after completion of the component executed by the ADB (i.e. excluding the study for DPRK) is the focus of a separate second volume.

2.1. Terms of Reference for the Concurrent Evaluation Phase

The Terms of Reference (ToR) for the external evaluation of the concurrent phase is twofold; First to evaluate the implementation of the capacity building activities of the project, in particular, the following aspects of training workshops:

1a. Relevance and extent of coverage in relation to project objectives,

1b. Quality and usefulness of training materials prepared,

1c. Benefits perceived by country participants,

1d. Cost-effectiveness, and

1e. Reliance on regional institutions/resource persons and promotion of regional cooperation.

Second, to evaluate the extent to which country-level human and institutional capacity has been developed under the project in respect of:

2a. Preparation of national GHG-inventories by the IPCC methodology,

2b. Analytical/modelling capabilities for development of least-cost strategies for GHG abatement, and

2c. Analysis of GHG abatement of options and preparation of project pre-feasibility documents.

2.2. Terms of Reference for the Post-Evaluation Phase

The ToR for the post evaluation phase (to be presented in the next volume) is first to evaluate the extent to which the project outputs by the country teams are likely to be useful to the Governments in the preparation of their National Communications to the United Nations Framework Convention on climate Change (UNFCCC).

Second, it is to evaluate the extent to which the project outputs by the country teams, in particular the project pre-feasibility documents, are likely to be useful to multilateral development banks (MDBs), other donors, and the private sector in planning investments in GHG abatement projects.

Third, to evaluate the extent to which the human and institutional capacities built up by the project constitute a self-sustaining critical mass, capable of providing support to Governments in respect of their UNFCCC commitments.

Finally, to evaluate the usefulness and durability of the regional linkages forged under the project.

3. EVALUATION APPROACH

This evaluation is undertaken primarily as a desk study of the wealth of written ALGAS-documentation in the form of workshop compendia, interim and progress reports, project status reports (PPERs), back to office reports (BTORs), Year End Reports (YERs) from all involved personnel (NTEs, ITEs, ADB-staff), completed workshop evaluation forms, as well as field visit reports from various project participants. As regards assessment of the implementation of the capacity building activities of the ALGAS project, in particular the training workshops and study tours, the various country participants (NTEs) have submitted relatively detailed BTORs covering the workshop and study tour contents, materials received, as well as their assessment of what they had gained from attending, and what they had missed or would have liked to see there. Some of these BTORs also contain the participants judgement of where they stand as regards capacity and capability to meet the ALGAS goals after the workshops ad study tours, and what additional input they would need to meet the stated ALGAS goals. The ITEs BTORs from TA missions to the various countries for follow up support in the wake of the workshops provide complementary and balancing judgements as regards the issues raised in the TOR for this evaluation.

This has been supplemented by the evaluator with communications-based (e-mail and fax) interviews with available NTEs, ITEs, NCAs, the RPC and ADB-staff. In addition, during visits to Manila and participation in the final workshop in November 1997, the evaluator has personally interviewed a number of the above categories of persons as well as UNDPs GEF-responsible officer from New York, who was available to meet the external evaluator while both visited Manila, and also GEF staff and other aid agency representatives involved in complementary projects. Where necessary, these interviews were followed up with more detailed e-mail communication.

The approach adopted in this evaluation has been as follows:

Questionaires have been designed by the evaluator on the basis of the ToR for each category of ALGAS actor (NTE, ITE, NCA), asking the various ALGAS actors to assess each and every aspect of the training workshops that the ToR focusses on specifically. Secondly, asking each of them to pass judgement on the extent to which country-level human and institutional capacity has been developed under the project along the dimensions listed in the ToR.

The questionaires were sent out to all NTEs, ITEs and NCAs in the autumn of 1997, and followed up in person with the participants at the final workshop in Manila in November 1997. In these interviews, the evaluator tried to press for more details and exactness in the answers, and took the opportunity to rephrase

certain questions on the basis of some of the early responses where conflicting answers to the same question emerged. New questions were developed for personal interviews with the participants . In addition, comprehensive personal interviews with representatives of ADB and UNDPs New York-based GEF-officer for the ALGAS project were conducted focussing on the praise and criticism /misgivings uttered by the NTEs, NCAs and ITEs, in order to establish facts and highlight opinions on conflicting issues in a balanced way. This was considered a requirement to establish whether and to what extent such information could contribute to the evaluation of the implementation of the capacity building activities of the project.

Several of the ALGAS participants required anonymous treatment of their responses as a condition for frank and open answers. This has been respected throughout this report, and has constrained some of the statements in the evaluation. On the other hand, other ALGAS participants did not require such immunity, and this has allowed for confronting other ALGAS participants with their critical statements. The evaluator has then passed professional judgement on the issue as it relates to the ToR.

The questionaire survey supplementing the review of the various ALGAS-reports, was designed as a total population survey, and not a sample survey. However, as always in such cases, not all participants responded to the questionaire, not even after a second round of reminders, and the quality and detail in the answers varies substantially among those who did answer. Some of these discrepancies and shortcomings have been eliminated by means of the post-questionaire interviews, but the resulting sample is still limited. However, it is emphasized that every effort has been exercised to avoid biases in carrying out the questionaire-based and interview-based surveys.

This concurrent phase evaluation report is edited such that each part addresses one aspect listed in the ToR, drawing on the various reports, questionaire responses and interviews carried out. It is organized in a logical framework format, i.e. it lists the ALGAS actitiy and the objectives it shall meet, followed by the ALGAS outputs and finally the goal achievements based on the analysis of the material reviewed and the interviews carried out.

4. PROJECT ACTORS AND THEIR ROLES

ALGAS is a very complex project involving a large number of categories of agencies/institutions , a large number of institutions in some of these categories, and a large number of individual experts in different capacities. In many ways the project is organized in a novel and innovative way that is likely to have had an impact on the implementation of the capacity building activities as well as the resulting capacities in the participating institutions.

In order to facilitate the concurrent evaluation analysis for the reader, the various actors and their respective involvement and roles are briefly outlined in the following. Actions taken or not taken by the ALGAS actors and the consequences of these actions on the implementation and the outcome of the capacity building are best judged in relation to the roles and responsibilities of the various actors. Therefore, the presentation in the following.

ALGAS is predominantly a GEF-funded project with UNDP through its Regional Bureau for Asia and the Pacific (UNDP/RBAP) as the GEF implementing agency. UNDP selected ADB as executing agency. UNDP, however, provides overall guidance to the project in close collaboration with ADB. They agreed to appoint a Regional Project Coordinator (RPC) as an ADB-based consultant with a comprehensive mandate but subject to ADBs Project Administration Instructions (PAIs) for the duration of the project. UNDP Manila is the Principal Residence Representative (PPRR) while the UNDP Country Offices for ALGAS countries provide support to country-level project coordination.

ADB staff directly involved in executing the ALGAS project are as follows:

(i) Chief, Office of the Environment and Social Development (OESD);
(ii) Manager, Environment Division (OESD);
(iii) Environment Specialist (OESD) as Project Officer;
(iv) Senior Environment Specialist (OESD) as Alternate Project Officer;
(v) Technical Assistant/Local Consultant to OESD.

ESCAP administers the ALGAS project in DPRK in close cooperation with ADB. The Chief, Environment Section, Natural Resources and Environment Management Division acts as the ALGAS project coordinator at ESCAP.

Each of the twelve participating countries has designated a National Counterpart Agency (NCA) as focal point of the project in the country and responsible for overseeing and coordinating the national work plan.

The National Technical Experts (NTEs) are key local consultants working closely with the NCAs in developing and implementing the national work plans. The team of NTEs is headed by a national Team Leader (TL) or Coordinator.

The International Technical Experts (ITEs) are the international consultants selected by ADB responsible for providing technical inputs to the project to ensure that the outputs are of professional quality. The American consulting firm Alternative Energy Development, Inc. (AED) was contracted to take on this task with a series of sub-contractors in specialized fields of direct ALGAS-relevance. As stated in chapter 1 above, the majority of these experts were from the Region. The team of ITEs is headed by a Team Leader (TL-ITEs) from AED who is a USA-based Malaysian national. There is a separate ITEs team for the DPRK. The total allocation of time for the ITEs over the entire 3.5 year duration of the ALGAS project was 72 personmonths. About half of this time was allocated for the five regional and three sub-regional training workshops. To put this in a perspective; That leaves about one personmonth per year (equal to about two days a month) of ITE-support for each of the participating countries outside of the support provided during workshop participation.

Other bilateral and multilateral agencies e.g. UNFCCC, USCSP, UNEP, IRRI and non-governmental agencies (NGOs) e.g. Climate Change Action Network, etc have ongoing programs with common objectives similar to the ALGAS project.

PART II:

IMPLEMENTATION OF CAPACITY BUILDING ACTIVITIES

5. ALGAS GOALS AND STUDY FOCUS

The overall objective of the ALGAS-project is to enhance the existing national and regional capacity to develop least-cost greenhouse abatement strategies that promote environmentally sustainable economic development in twelve countries. The focus of the study is as follows:

a. To help participating countries prepare their national inventories of greenhouse gases (GHGs) and sinks to meet their reporting commitments under the Climate Change convention.
b. To develop national and regional capacities to identify, formulate and analyze GHG abatement options for several Asian countries.
c. To develop national and regional least-cost GHG abatement strategies through the preparation of national mitigation plans. and
d. To prepare for each country a pipeline of viable, least-cost GHG abatement projects that will dovetail with the countries' economic development strategies, and submit these for consideration for further.

6.

THE WORKSHOPS

6.1. The Evolution of the Scope and the Setting for Implementation

The main ALGAS activity to fulfill the ALGAS goals was a series of training workshops at regional, sub-regional and national levels, and approximately half of the allocated ITE-time was spent on preparation and implementation of such workshops.

The UNDP-GEF project document had specified the TOR and the scope of the study on the assumption of a high degree of uniformity/homogeneity in the analytic modeling needs among the participating countries. It soon became clear, however, that the pre-project capabilities to undertake the various ALGAS tasks varied enormously between the ALGAS participating countries, and that the workshop contents and coverage as well as the complementary TA had to be country specific in order to meet the project objectives in a cost-effective manner.

At each regional workshop, meetings by country were held with the NCAs, NTEs, ITEs, ADB and UNDP to review project implementation. It was also decided to arrange the APRB meeting at the same time, with NCAs participating, and thus save on time as well as travel budgets. These meetings were the basis of determining the specific requirements of the in-country TA missions complementing the workshops. ADB responded to such demands by supplementing the contracted comprehensive inputs from the AED-managed ITE-Team with the following formal training session presentations by ADB staff from various ADB departments:

1. Regional Workshop on Mitigation:
    a. Stuart Andrews: Clean coal technologies.
    b. Prodipto Ghosh: Policy instruments for GHG abatement.

1. Project Preparation Workshop:
    a. Stephen Curry: Economic analysis of projects.
    b. Robert Dobias: Environmental considerations in project preparation.
    c. William Staub: Social development considerations in project preparation.
    d. John Whittle: Logical framework for project design.

Additionally, the Manager, ENVD, and the Project Officer actively participated in technical discussions in several of the training workshops and furnished comments/clarifications. In this way, in the specific area of the Bank's comparative advantage, i.e. project preparation and policy issues, ADB staff furnished important supplementary capacity building inputs. Further, ADB technical inputs in the field of

Climate Change were furnished in the detailed specification of the content of the training activities/materials, and this may be judged from the fact that the actual capacity building activities were structured very differently from that in the original UNDP-GEF project document. ADB, in consultation with the ITEs, rewamped the entire content and structure of the training workshops following the First Regional Workshop, after eliciting the countries' requirements from the NTEs and NCAs. All of the following *additional* capacity building activities followed from this review:

a. MARKAL/MEDEE-EFOM/COPATH-COMAP model training;
b. Methane emissions from rice paddies;
c. Project preparation workshop;
d. Provision of AHP model;
e. Regional database;
f. Empirical measurements of methane from rice paddies;
g. Regional Thematic Support Group (presently under implementation)
h. ALGAS Website (presently under development)

At the First Regional Workshop therefore ADB asked the NTEs what they needed. Demands varied between countries, but the methane measurement training came out as an explicit result. A methane workshop for livestock was dismissed, since India already has a national research program on this, and the other countries where this could have been relevant lack suitable facilities. Consequently, this training component was not considered to be feasible under ALGAS.

The Bangkok workshop was therefore designed in practice to introduce a menu of models and provide some exposure to them so that as many as possible of the country demands could be met. It would then be up to the countries to choose and ask for specific follow up training, which then ADB would fund as an additional effort.

6.2. The Regional Workshops

The initial regional workshop was held in February 1995 as a "Project Launching Workshop". This was followed by another Regional Workshop that took place in Manila in June 1995 focusing on project approach and methodology (A&M) which in a sense constituted the substantive startup of the ALGAS project. The national workplans, developed initially during the initiation/reconnaisance missions earlier in the year were presented here over a four day period. The workshop was attended by one representative from each NCA and two from each NTE Team. They were asked to prepare and present their acceptable level of effort, workplan emphases, and national budgets to carry out the objectives of the project.

The workshop provided a forum for country, regional and international experts to discuss appropriate approaches and methods to be used in the ALGAS project for:

- Conducting greenhouse gas (GHG) emissions and sink inventories, and undertaking any additional needs, customization, and improvements in the IPCC methodologies to enable the ALGAS countries in meeting their UNFCCC reporting obligations.
- Assessing a country's GHG mitigation options that foster continued sustainable development, and
- Developing a country-specific portfolio of potential least-cost GHG abatement initiatives.

The two primary outputs from the 4 day workshop presentations and discussions were:

- A compendium containing a set of methods and issue papers that would form the basis of GHG emissions inventory and abatement planning unde the ALGAS project, and
- Workplans that establish the countries' needs, priorities, and detailed activities to be undertaken under ALGAS.

Following the workshop in Manila in June 1995, the First Regional Workshop on GHG Inventories took place in New Dehli in November 1995. This Regional Workshop had 63 attendants from all ADB-contracted ALGAS participating countries, plus several observers and international experts.

The Workshop focused on the following ALGAS objectives:

1. Train the NTEs in the IPCC methodology
2. Compile information on region/country
3. Assess needs for further capacity building

The outputs of this workshop were as follows:

1. Task A reports received and reviewed
2. Regional GHGs manual prepared
3. Training materials prepared by ITEs and ADB-experts and handed out to NTEs
4. It led to the implementation of a workshop on CH4 emissions from rice paddies
5. It led to provision of in-country TA

6. It led to the implementation of national workshops

The next Regional Workshop lasted two weeks and dealt with development of GHG-mitigation least-cost plans and projects, and was held in Bangkok in March 1996 with close to 200 participants, including almost 70 experts from all 12 ALGAS participating countries. The purpose was to enhance Asian country and regional capacity in developing GHG mitigation assessments, national action plans and least-cost projects. The principal objectives of the workshop were to provide training in mitigation assessment and serve as a forum for exchange of knowledge and experience among Asian countries. At the workshop the participants were instructed in the concepts, techniques and tools of mitigation analysis, and explored issues particular to Asian countries in conducting a GHG mitigation assessment.

Workshop outputs included aquisition among the participants of:

- Knowledge of enhanced tools to develop their national GHG mitigation assessments,
- Knowledge for the establishment of national GHG mitigation action plans,
- Knowledge for initiating mitigation projects
- Insight into a variety of GHG mitigation asessment modeling options and their limitiations,
- Tested rules of thumb drawn from ALGAS country experiences

Furthermore, the workshop reviewed the criteria as well as processes by which least-cost portfolio of GHG mitigation projects can be developed for countries to access international private and public sector funding to undertake actions related to reductions of climate change and its impacts.

The third Regional Training Workshop took place in February 1997 in Manila. It addressed preparation of GHG abatement projects with resource persons from the GEF-Secretariat and the GEF implementing agencies in addition to the ADB experts and ITEs. A lot of case studies were presented and discussed to assist NTEs and NCAs in identifying and formulating proposal projects for GEF funding.

6.3. The Sub-Regional Workshops

The September 1996 Sub-regional 5 days workshop on COMAP/COPATH modelling training was attended by NTES from 10 ALGAS countries. The COMAP model is used for developing and assessing forestry mitigation options, whereas the COPATH model is used for preparing the emission inventories from the forestry sector.

The Sub-Regional Training Workshops on Methane Emissions Measurement from rice paddies constituted part of Task A of the ALGAS Project. It was organized in Beijing in September 1996 and in Thailand in October/November 1996. They were attende by NTEs from 11 ALGAS participating countries and was organized in response to NTE-requests for precisely such Region-specific information and measurement experience and expertice.

The Sub-Regional Training Workshop on the Energy Models MEDEE-S/ENV and EFOM/ENV took place in September 1996 in Bangkok with attendance from six of the ALGAS countries. In addition, NTEs from DPRK took part in the MEDEE-S/ENV training.

A follow up EFON-ENV training programme for ten days took place at AIT, Bangkok in April 1997 for a total of ten participants from Indonesia, Pakistan, Viet Nam, R.O. Korea and DPRK.

A sub-regional 10 days MARKAL model training workshop was organized in Canberra, Australia at ABARE in November 1996 for NTEs from India, Bangladesh and the Philippines. The explicit goal was to enhance the existing MARKAL model for each country, and -- if time would permit -- its capability to undertake least-cost modelling of GH abatement from the energy sector, as well as undertake simulations to indentify cost-effective strategies abate GHG emissions (i.e. construct CERI curves).

Two Philippine NTEs attended the Landfill Gas-to-Energy Training Workshop for Asia and the Pacific in Bangkok in November 1996. It provided hands-on training in application of the Landfill Gas-to-Energy recovery model developed by the USEPA.

6.4. National Workshops

Various national training workshops on inventorying, GHG mitigation and national least-cost abatement strategies were initiated and organized by the participating countries. In most cases the attendance of Government officials from NCAs and other agencies as well as of researchers has been encouraging, and the ITEs have participated as resource persons and prepared country-specific hands on training materials. These workshops total 35 and are distributed as follows:

3 in Bangladesh
3 in P.R. China
4 in India
4 in Indonesia

4 in Mongolia
2 in Myanmar
3 in Pakistan
5 in the Philippines
3 in Thailand
4 in Viet Nam

6.5. Relevance and Extent of Coverage in Relation to Project Objectives

The evaluation analysis of the various ALGAS reports and interviews carried out in the context of this evaluation conclude that the relevance and extent of coverage was by and large satisfactory for all the Regional-, Sub-Regional and National Training Workshops, and that the various workshop objectives listed have been substantially achieved as intended . It is the assessment of this evaluator that the workshop programs and the accompanying training materials have been carefully designed and prepared so as to be highly relevant, applicable, hands-on oriented and user-friendly and because of their complementarity and interdependency providing a broad and comprehensive coverage as regards the ALGAS objectives.

The sub-regional- and national model-, measurement- and inventory training workshops were a derived need from the regional workshops, and as such tailormade to the requests for more hands-on applicable training in order to meet the ALGAS objectives. As such they have proven valuable in terms of relevance as well as extent of coverage, although it must be concluded that the poor attendance of the National GHG Mitigation Workshop in India is unlikely to be conducive to the degree of goal achievement in respect of stimulating national awareness and interest and Government involvement in the ALGAS project and the global issues it focuses on.

From the above review, this evaluation concludes that compared to the original scope of the ALGAS Project, the relevance and extent of coverage was significantly expanded and made more country relevant for implementation than would have been achieved otherwise.

6.6. Quality and Usefulness of Training Materials Prepared

The A&M Workshop in June 1995 provided a compendium containing a series of technical papers on:

- Developing GHG sources and sinks inventories
- GHG mitigation asessment techniques and options
- Identifying and assessing GHG mitigation options
- Assessment techniques for mitigation projects options
- Financing least cost GHG abatement strategies

The training materials were well received by the participants and is considered to be well designed to meet the ALGAS goals.

The First Regional Training Workshop on the Preparation of GHG Inventories in November 1995 resulted in the distribution of training materials as follows:

- The three volume IPCC guidelines and GHG inventory software;
- A draft GHG inventory accounting manual (subsequently replaced with a revised one);
- Two volumes of background reference materials

The feedback from the participants regarding quality and usefulness of the training materials received was favourable, and the evaluator shares the view that these outputs are useful and of high quality for the achievement of the ALGAS goals.

The Second Regional Training Workshop on development of GHG mitigation least-cost plans and projects produced training material documents that were assembled in two volumes. The first covered the following topics:

- Development of GHG Mitigation Assessment
- Characterization of GHG Mitigation Options
  - Energy supply options
  - Energy demand options
  - Non-energy sector options

The second volume covered the following issues:

- GHGmitigation models and the development of CERI curves
- Description and demonstration of models
- International related activities
- Multi-criteria analysis of mitigation options
- Development of national mitigation action plans
- Identifying, designing and developing GHG mitigation projects

The participants were somewhat more favourable to the training materials received than to the training provided. In the view of the evaluator the materials provided were useful from the perspective of the ALGAS goals and of good quality.

The feedback from the Third Regional Training Workshop on preparation of GHG abatement projects in February 1997 was that the lectures, resource persons, exercises/case studies and materials received were all rated above average – as a fact as very good -- by the majority of the participants. The evaluator shares these views.

The training materials prepared and circulated for the sub-regional- and national measurement-, model- and inventory workshops were of high quality and hands-on relevance to the participants who found these workshops and the accompnying training materials most useful.

6.7. Benefits Perceived by Country Participants

It appears from the BTORs and the interviews carried out as part of this evaluation that the First Regional Training Workshop on the Preparation of GHG Inventories was perceived as very helpful for the participants directly involved with the preparation of the national inventories, since they received detailed training on the step-by-step procedure for assembling the inventory, and were able to discuss country-specific issues regarding the IPCC methodology with the ITEs and ADB representatives, and have exchanges with other NTEs about workplans etc.

It appears that the workshop helped in clarifying IPCC conceptual issues, and demonstrated the usefulness of a common approach in place of different units in different countries. Several participants identified weaknesses in the IPCC methodology and default values, and asked for preparation of modifications to the methodology and default values to suit the Asian context. Methane emissions from rice paddies were identified as an area in need of revisions. The participants identified a need for more hands on training with kits covering emissions from agricultural sources including paddy fields, landfills etc., and a need to expand the number of local experts and scientists to establish a sufficiently broad national capacity to sustain the ability to continue the updating of ALGAS activities once the project is over. The participants provided detailed advice on their specific training needs.

It is precisely from such feedbacks that the ADB together with the AED-led ITE-Team formulated the additional training activities to those listed in the original training document prepared by UNDP-GEF . In this sense the project initiated and implemented ALGAS activities beyond the original ALGAS goals.

As regards the Second Regional Workshop addressing the development of GHG-mitigation least-cost plans and projects, the overall impression is unanimously favourable as regards ALGAS goal achievements. The participants concluded that the workshop had enhanced country and regional capacity to perform the stated tasks (this was especially emphasized by the analytically least developed among the participating countries), but that further training combined with a considerable amount of self-study would be needed to complete these tasks.

However, one NTE in particular reported that they would have benefitted much more by having some more in-depth and hands-on training with the models rather than just presentations to introduce them. They claimed that with such a heterogenous group of NTEs one should have arranged some more advanced hand-on training in parallel sessions for those qualified for that.

This is exactly what was subsequently arranged by way of additional training activities (for MARKAL, MEDEE-S/EFOM, and COPATH/COMAP) by a supplementary budget in regional institutions which specialized in each type of model.

Moreover, while the original UNDP-GEF project document required the countries to adopt the same modelling approach, after consultation, this was not considered appropriate. Accordingly, one purpose of the Second Regional Workshop was to give the participants (NCAs and NTEs) sufficient exposure to the different models so that they would be in a position to choose the model(s) best suited to their requirements, in which the NTEs (not NCAs,being unnecessary, and also not having the requisite disciplinary backgrground) would be given intensive training. The participating countries were unclear prior to the workshop which modeling approach they would adopt. It was accordingly neither feasible nor desirable to conduct intensive training in the analytical models at the Second Regional Workshop.

The Third Regional Training Workshop in February 1997 addressed preparation of GHG abatement projects and met or exceeded the expectations of all respondents. 27 participants responded to a workshop evaluation questionaire. They all felt it was relevant or highly relevant to their ALGAS tasks. 18% said that the skills aquired at the workshop would be directly applicable to their ALGAS work, while the remaining 82% confirmed applicability of the aquired skills, and all of them rated the workshop as useful from their ALGAS perspective. Lectures, resource persons, exercises/case studies and materials received were all rated above average -- in fact as very good -- by the majority of the participants. The learning had been particularly strong as regards proposal development of GHG abatement projects (which was the primary purpose of the workshop) and for principles and critera of GEF and ADB. Certain changes were proposed to improve on a future workshop; the most important issue was a request for more practice time for case studies/proposal writing.

As it turned out, the participants in the Sub-Regional Training Workshop on models expressed through their BTORs that they were satisfied with the COMAP presentations, but there were several specific issues raised as to applicability in a country specific context, such as constraints in the choice of base year.

The evaluator's comment to this is as follows: Issues such as country parametrization arise in respect of all analytical models. There are no models ab initio applicable to all countries. In all cases the training focused on country-specific parametrization.

There turned out to be hardly any time at the workshop to present the COPATH model, and the need for that capacity building component remained unmet

after the workshop. However, at the request of the participants, more time was given to COMAP, as it held the greater interest. Inventory preparation for the forestry sector, being the focus of COPATH, was felt to have been adequately covered in the First Regional Workshop.

As regards the Sub-Regional Training Workshop on Methane Emissions Measurement, it is unanimously reported in the BTORs that these were most useful hands-on training workshops where the participants aquired first hand knowledge of equipment to be used. It benefitted all participants in accordance with the stated goals.

The various BTORs emphasize the usefulness of the Sub-Regional Training Workshop on the Energy Models MEDEE-S/ENV and EFOM/ENV took place in September 1996 , and how well it was organized, although there were some complaints about bugs in the models that resulted in wastage of workshop time. However, it is this evaluators view that since virtually all complex models have bugs, these are gradually removed as they are encountered during use. A completely bugfree model would likely be obsolete.

Some also expressed a wish to use the data they brought from their respective countries rather than having to learn it all on case studies that no-one could relate to since the data (which in fact were real country data) had been anonymized. This was the decision of the ITEs and was made for pedagogic reasons for exposition purposes. The countries in any case were required to use their own country data for the study, and a great deal of further help was provided by in-country TA Missions.

There is no BTOR available from the EFON-ENV Follow-Up Training Programme at AIT in April 1997 from the participants, so it is not possible to judge their perception of the quality and goal achievements of this workshop. However, judging from the program, it was of a hands-on nature, as had been requested at the first workshop on this topic half a year earlier.

By the completion of the MARKAL Model Training Workshop in November 1996, it is reported that all three country teams had made considerable progress with their model development and troubleshooting capabilities, and could depart with an operational draft work program. It maximized hands-on computer training combined with a one-to-one guidance and advice on specific issues faced by each country. Formal presentations were kept to a minimum. Whereas the second Regional Workshop in Bangkok in March 1996 was meant to introduce the models to the participants, the subsequent training workshops were meant to impart in-depth skills. Each workshop was designed to suit its specific purpose. Nevertheless, it was judged by the ABARE organizers (the NTEs) that the participants would benefit significantly if more follow-

up in-country training could be provided when addressing country specific policy and technological issues and on interpreting modelling outputs.

The BTOR from the Landfill Gas-to-Energy Training Workshop in November 1996 is most favourable on all scores. The ALGAS objectives were obviously met.

By and large, the various national training workshops that have emerged in response to national needs in the fields om measurement, modeling and inventorying have had very good attendance from NCAs and the research communities, with one India-event perhaps being an exception. The ITE Team Leader attended in October 1996 the India National Workshop on GHG Mitigation. Compared with similar workshops in P.R. China, Indonesia, Myanmar, the Philippines, Thailand and Viet Nam, the attendance was disappointingly low from the opening, and it dropped further during the workshop. As such, one must conclude that it did not immediately meet the objective of stimulating the national interest and involvement in the ALGAS project, or to build support and concensus for the approach, methodology and results of the project. The apparent poor communication between the NTEs and the NCAs is seen as an important part of the explanation for this. However, we reiterate that this appears to have been the exception. As a rule there has been very good attendance to these workshops.

6.8. Cost –effectiveness

6.8.1. Impacts of the Project Organization and Management Set-up

Being the biggest and most complex ADB Regional TA so far, project organization and actions taken by the actors as a means to timely and cost-effective implementation is of particular importance. . The following events and start-up actions related to project organization and execution were reported by various ALGAS actors as having contributed to making an already complex project structure no less complex to manage during the early stages:

(a) Staff replacements at the key ALGAS posts at ADB and UNDP at the hectic and critical time of organizing this complex multicountry project meant that important ALGAS-related institutional memory had to be transferred to newly hired senior staff members with a limited time overlap between the new and the old project officers in the two institutions.

(b) Initially establishing an organizational model with 3 positions (i.e. the RPC, the ITE-team leader, and ADBs project officer) that could appear to "outsiders" (i.e. NCAs and NTEs) as 3 competing project leaders provided for possible confusion as regards lines of command and control and of communications. The majority

of the ALGAS actors have reported that the project progressed much more smoothly once the RPC-position was removed and clear lines of command and communications established.

(c) After the ITE Prime Consultant (AED) and its team was contracted to start work, they were at the same time engaged in lengthy contract variation negotiations with ADB and faced difficulties in retaining the originally proposed ITE-experts for the assigned field missions and workshops.

Overall, however, these early incidences did not in any substantive way impact adversely on the eventual project outcomes.

In practice, the Approach and Methodology Workshop that took place in June 1995 represented the active ALGAS project startup for most of the participating countries. The finalization date was therefore initially extended until 30. June 1997, and later extended further, reflecting the more realistic 3 year time frame assumption in the original UNDP-GEF Project Document.

Additional extensions of deadlines were granted for some participating countries in view of their delayed startup, once it appeared that the various modelling efforts were more time-consuming than originally anticipated.

A couple of countries were late (relative to previous extended deadlines) in submitting their final reports. The Republic of Korea (ROK) entered the study late and have had a different time table and agenda than the other countries. ROK demanded and received in total a US$ 350,000 grant from ADB as their sole external financing. Their participation came as an addition to the original GEF funded ALGAS project budget. The Thailand study has also been experiencing scheduling problems due to personnel reasons. One key resource person died and another left the project.

These schedule delays must be seen against the originally planned starting date of December 1994, the formal starting date of February 1995 and the practical start-up of project work in June 1995. The original project document prepared by UNDP-GEF, specified 3 years as the duration of the project. The substantive commencement of the project was in June 1995 (with the Approach and Methodology Workshop). By late 1998, all countries will have submitted their Final Country Reports duly reveiwed thrice by the ITEs, and twice by the external reviewers, and the Governments. Therefore, the project overall – dispite significantly enhanced capacity building activities relative to the original project, and in spite of a much more comprehensive (but none-the-less much needed) and time-consuming review process – will be essentially completed with only modest extension of the originally envisaged 3 year timeframe from substantive

startup, but of course delayed in time terms relative to the originally envisaged start up callender time.

The following factors should taken into consideration when assessing this rate of progress:

a. The delayed start-up in Myanmar , Republic of Korea and Mongolia due to problems internal to the NCAs;
b. Large program of additional capacity building activities formulated during project implementation as the needs of the countries became apparent; and
c. Two rounds of external peer review of the country reports, not contemplated in the original project document.

Finally, and not the least, significant expansion of project activities and review efforts beyond what had originally been planned were conducted by the Consultants (the ITE-Team headed by AED) without much additional budget. In this sense, the recipients (NTEs and NCAs) got more than they were initially supposed to get from the project, whereas the ITE-Team had to provide more hours of input to achieve this than they had anticipated at the time of project startup.

6.8.2. Logistical Workshop Support and Travel Arrangements

The travel arrangements (tickets, visa, hotel, per-diem) were made by the concerned UNDP country offices with the help of reputed travel agents, while UNESCAP arranged discounts on the hotel rates. It appears that this arrangement did achieve direct cost savings for the projects. Some NTEs complained about late and slow processing of travel arrangements sometimes resulting in inconveniences for them. On the other hand, UNPD claims that late submission to UNDP of the country nominees and participants for the workshops could be part of the explanation.

The deliberate approach followed in the Second Regional Workshop was that of of first giving initial exposure to a range of models to enable the country teams to choose their own models, and then providing intensive training in the selected models. It is ADB's carefully considered view that this was the most practical and cost-effective option, and it was determined after detailed consultation with expert modelers among the ITEs and ADB-staff. It should be noted that since the original project document prepared by UNDP-GEF did not provide for such intensive training, supplementary funds had to be provided by ADB under its RETA procedures. Inevitably, such action takes some time. However, this was not a source of delay in the project, because analytical modeling must be preceded by detailed identification and screening of technology options, and data collection (much of which is common to all energy

optimization models) . It is the assessment of this evaluator that any disappointment due to this workshop not being more hands-on oriented is based in unrealistic expectations given the tremendous variation in skills and experience among the NTEs.

As regards the Methane Measurement Workshop it appears that cost-effectiveness was enhanced because IRRI called upon people who actually do inventorying and urged the ALGAS country teams to abide by such approaches.

As regards the September 1996 regional modeling workshop, it was not possible to have a longer workshop, given the available project resources. The workshop was well received from a logistical and organizational perspective, although again there were some complaints about the travel arrangements.

6.9. Reliance on Regional Institutions/Resource Persons and Promotion of Regional Cooperation

One NTE has stated that the Second Regional Training Workshop was organized in such a way that there was virtually no time to interact and meet with NTEs from other ALGAS countries and establish a lasting interaction and network, which was an important ALGAS objective. As of November 1997, e.g. the Philippines had no regional network with other ALGAS NTEs. They had not received other inventory reports (except from Thailand) for comparison to their own approach and results.

This complaint is partly based on a misunderstanding. Such inventory reports represents work in progress which is directly relevant to the UNFCCC negotiations process. It is considered sensitive by most Governments, and is therefore as a rule not communicated to others by the project team. Nonetheless, it would of course have been beneficial from a research perspective if Governments decided to to release and circulate such information regionally to facilitate the work and communications of the various NTEs.

It is unfortunate that this NTE was unable to establish regional network contacts -- at least informally --after the participants had been spending ten days together. While it would not be feasible to include formal networking in each and every project activity, the project specific formal regional networking effiorts of the ALGAS project gradually developed to a significant activity, as seen from the list below:

a. Provision for e-mail communication between the ALGAS actors;
b. Inclusion of NTEs in some of the ITEs team;

c. Substantial reliance on regional institutions (e.g. ABARE, IRRI, NPL, IIS, AIT, etc) for capacity building activities; i.e. the various workshops, TA missions and the ITE reviews of country reports.
d. Regional databases;
e. Regional thematic support group of experts;
f. ALGAS website;
g. Study tours;
h. ALGAS newsletter;
i. Coordinated program for empirical measurement of methane from rice paddies.

As regards the Methane Measurement Workshop which was organized by IRRI, as well as the several modelling workshops, they relied on regional ITEs and regional institutions and thus promoted regional cooperation, as stated as an explicit ALGAS goal.

In addition, it must be emphasized that there were several exchanges of experts among the ALGAS countries helping each other with activities and tasks of the project such as peer reviews, training workshops on forestry models, in-country TA, etc.

As regards access to and use of e-mail to facilitate inter-ALGAS communication, this evaluator has experienced that while the ITEs and NTEs have installed and actively use this mode, such facilitating communication technology remains largely unused by the NCAs.

7. THE TECHNICAL ASSISTANCE (TA) MISSIONS

Complementary to the workshops were the comprehensive TA-activities provided to the NTEs by the ITEs and ADB –staff. A lot of this was assistance to prepare the NTEs for actual implementation of the tasks defined in the ALGAS TOR and to follow up with clarifying and in depth operational advise on the various ALGAS activities.

Some TA-missions were carried out by ITEs in 1996, and BTORs from these are available. Three such missions took place in July 1996 and dealt with country-specific follow-up of the MARKAL model use by ABARE experts in India, Bangladesh and the Philippines.

The ITEs identified important technical project bottlenecks and training needs and recommended actions to be taken to avoid delays and failure to meet the project goals . The detailed MARKAL sub-regional training workshop in late 1996, which -- as seen from the above referred to NTE-BTORs -- contributed significantly to enhancing the country-level capacity and capability in this modelling field in the three concerned countries, was conceived by consultation at the Second Regional Workshop, on the basis of which the ADB proceeded to provide supplementary funding for these activities. Follow-up ITE-mission work in India in 1997 is reported below. As regards Bangladesh, the May 1997 ITE-mission noted that the documentation of data sources was excellent, but there was a need to clarify and correct some key parameter values. The mission concluded that significant progress had been made and that the Bangladesh team was well placed to use the MARKAL model as a basis for the relevant ALGAS input. With regard to the structure of the model, the ITE-mission noted that it would be of value to prepare for scenarios reflecting the structural adjustments in response to the potential economic reforms and deregulations in the national economy. However, they needed an upgraded version of MARKAL GAMS code and MUSS.

Two of the missions dealt with forestry assistance in Thailand and Pakistan respectively, and provided technical advice and projection comments to the respective NTEs. There was nothing in these BTORs of direct relevance to the assessment of the implementation capacity building activities of the ALGAS Project, but the ITE-input in the form of technical analyses helped clarify important analytical assumptions for the ALGAS tasks in the two countries.

The remaining TA-missions assisted with start-up difficulties and technical reviews, and attended national GHG mitigation workshops. The Myanmar TA-mission in October 1996 was typical in this respect. This rather isolated country entered the ALGAS Project with a late start, and was provided assistance to prepare and execute

the kick-off and GHG inventory training workshop. This was attended by more than 50 people from various Government ministries and agencies, as well as providing training at the workshop. Training needs were assessed, and a workplan and timetable was established. They provided assistance in the use of mitigation assessment models, and identified the primary training needs and specified project equipment and data needs, as well as arranging for improved communications for the team via e-mail.

The similar meeting in R.O. Korea with the Korea Energy Economics Institute (KEEI) as the local NTE, established the KEEI capacity to undertake to implement the ALGAS tasks in R.O. Korea. It showed that KEEI has several of the relevant models and the capability to apply at least some of them, particularly the LEAP model. KEEI has already done some of the inventory work, and an ALGAS-work program was agreed for prioritized KEEI tasks.

The TA mission to P.R. China revealed concerns from the ITEs over the internal organization of tasks and responsibilities among the Chinese NTEs, even though it was reported that the project was progressing reasonably well with over 30 scientists working on the project, albeit on a part-time basis. A national inventory training workshop had been successfully completed with more than 70 participants. However, at the time of the TA mission in November 1996, a series of concerns likely to lead to delays were identified by the ITEs, including lack of equipment for field measurements of methane emissions, lack of acceptable forestry data, lack of a business as usual GHG national inventory, and lack of some reliable GHG emission inventory data. Furthermore, there was confusion as to where the responsibility of certain Task C and Task B activities should be located, and the ITE reached agreement with the Chinese NTEs on that. In general, the mission was not pleased with the progress on mitigation options identification. As regards Task C, very little thought had been put to the modelling work that must be done to develop the CERI curves required by the project. In sum, the ITE concluded that the Chinese ALGAS Team would need to focus all of its efforts in the time remaining to achieve the ALGAS goals.

As regards India, the ITEs reported that the NTE-team was making good progress in finalizing the national GHG inventory. With regard to Tasks B and C, the work was lagging behind schedule, but they were trying to make up for lost time. However, the ITE concluded that what had been produced in the field of major sources of GHGs in India, needed major improvements before it met with the ALGAS requirements. Another concern raised by the ITE in India was the apparent lack of communication between the NTEs and the NCAs, and between the NCAs and ADB. Furthermore, the NCA appeared to be confused as to its role and responsibilities in the project. An ITE-concern was that unless the NCA is comfortable with the project and the role that the NCA should play in it, the project runs the risk of failing to have its

activities and results officially recognized by the NCA and as a result by the Government of India. After the ITE TL took an inception mission to India for the specific purpose of familiarizing the NCA with the project, and for identifying NTEs in which the Government had confidence, the ADB felt that such concerns are no longer warranted.

A TA mission by ITEs in May 1997 provided training in modelling of least-cost GHG abatement for the energy sector, with emphasis on assessing, revising and testing the India MARKAL data-base. Policy scenarios were agreed on as a basis for using CERI curves. Significant progress is reported made with the India NTEs which by late May 1997 were well placed to use the MARKAL modelling tool as a basis for relevant ALGAS inputs within the planned timetable. Further model and data refinement potentials were identified in case the opportunity for implementing such improvements should arise.

The project in Mongolia was progressing slowly by late 1996, and they needed assistance to finalize their GHG inventory in a rudimentary way. The TA-mission in November found that as the project got into the more complex phases of GHG abatement assessment, development of least-cost abatement strategies, and the formulation of a portfolio of abatement projects, the Mongolians would need additional help from the ITEs. In order not to be critically delayed, the ITE-mission recommended a number of necessary TA missions to be organized as soon as possible to assist the Mongolian NTEs, each with a specific ToR.

In Thailand, by November 1996, the NTEs had made considerable progress, especially in Task A, and work was proceeding reasonably well in Task B. However, they were having difficulty in getting the work of Task C underway, because they needed help of an appropriate ITE to develop least-cost strategies, and in defining GHG mitigation options in the rice paddy and livestock sectors. Inadequate communication between ALGAS partners as well as between the NTE and the NCA caused certain problems such as lack of effective preparation and participation in workshops. By July 1997, the Thai non-energy team had prepared a series of concrete non-energy mitigation project proposal briefs in the forestry sector, and were in a position to apply the COMAP model, develop least-cost strategies, produce CERI curves, and complete all other ALGAS work by September 1997.

In Viet Nam, the review mission in November 1996 noted that most of the work on Task A had been completed, but they were still improving their estimates for the inventories in relation to agriculture and forestry. Their national GHG inventory and GHG mitigation options workshops had been successfully completed with a large attendance and successful awareness raising. Such ITE assistance was provided in 1997

and a revised set of emissions and inventories for these sectors were produced and incorporated. The Viet Nam Team had indicated a need for help in assessing abatement options and prioritizing abatement options under Task B, asking for this training to take place in early 1997. While it is valuable that several institutions are involved in the NTE-Team, it is also a concern that they are so widespread, since this complicates intra-team communication. An ITE-mission in the spring of 1997 helped the NTEs understand theories and concepts on macroeconomic scenarios, energy demand analysis and forecasting, least-cost energy supply planning with environmental constraints and concepts, and derivation of CERI curves. TA was at the same time provided to install, demonstrate and produce a baseline scenario run of the MEDEE-S/ENV and EFOM-ENV (plus two mitigation options on the latter) models for Viet Nam.

By the end of May 1997, an ITE mission to Indonesia concluded that the non-energy work was proceeding well. Much of the energy work is also completed (Task A, and parts of Task B) but clearly defined mitigation options and an assessment of barriers to their implementation and their financial and economic status was still missing by mid-year 1997, and would require closer cooperation between the team and the NCAs. As regards Task C, they have applied their own systems dynamic energy sector model (rather than an optimization model) to develop CERI curves and a national least-cost GHG mitigation strategy. Therefore, the model is not suited to develop CERI curves, and should be supplemented with a MARKAL modelling effort. The mission established that the ALGAS project has been successful in establishing, by means technical training, a reasonable capacity in Indonesia to undertake the preparation of a national GHG emission inventory, to assess GHG mitigation options, and develop a least-cost GHG mitigation strategy.

However, the staff working on the project briefs by mid-summer 1997 lacked the technical experience and knowledge of the specific mitigation options to be able to formulate good projects. Furthermore, the number of persons working on the ALGAS project in Indonesia on a full time basis is very limited, and this along with several other factors has caused significant delays in project outputs that at mid-year 1997 threatened the completion of the project on schedule. By having very little interaction between the energy- and non-energy teams of the ALGAS project there is a risk that the mitigation strategies will be sectoral rather than national, and this needed fundamental rectification before completion of the project in order to meet the project goal of a national integrated strategy.

An ITE-mission to Pakistan in late May 1997 established that the NTEs were comfortable with the MEDEE and EFON models, and that there was sufficient data to produce baseline and alternative scenarios for the energy sector. Selection of mitigation options in all sectors appeared to progress well and a simulation on an analytic hirarchy

process model was conducted to assess the mitigation options. The NTE team anticipated completion by end of September. The issue of what will happen to the capacity built up during the project once it is finished was raised with the Government of Pakistan and a decision to that effect was indicated for mid-summer.

PART III:

DEVELOPMENT OF IN-COUNTRY HUMAN AND INSTITUTIONAL CAPACITY BUILDING

8. THE SETTING for GOAL ACHIEVEMENTS

It appears to an independant outsider to the Project that the two year timeframe could not do proper justice to such a comprehensive and complex project. A 3 year timeframe as originally envisaged by UNDP-GEF would appear more realistic, and that is what the project is actually taking. The NTEs were expected to learn to understand, interpret and use various models and produce high quality outputs including all data collection in one year in practice. Many participating countries did not have experts available with the formal training and background required to aquire a "driving licence" in such tasks in such short a period of time. The smaller less developed ALGAS countries did take on a genuine interest in e.g. the methane emission measurements. This included Viet Nam from where they followed up by e-mail after the workshop and asked for more information on how to actually do the measuring. DPR Korea learnt about the problem at the workshop and expressed sincere interest in being helped, but has so far been unable to organize an effort. Bangladesh had difficulty keeping continuity in the participation and sent different people from those initially assigned. The overall impression is that those who were in need of assistance followed up with e-mail contact with the ITE at IRRI, whereas those who did not need it managed for themselves after the workshop.

On the other hand, the big countries were already well on their way towards the kind of inventorying that ALGAS was providing training for undertaking, and they had awareness as well as competence and capacity to do the job. In those countries, the role of ALGAS could be considered somewhat marginal since decisions to finalize such work would be a question of political priority to which ALGAS might have proven important at the margin. And yet, the capacity building of the project has been tremendous in terms of the number of actual manmonths of project-specific training and hands-on exercises that the Project has provided for actual modelling experience and field measurement practice. As regards the methane emissions, the IRRI-ITE feels confident that all ALGAS countries now have the capability to do the baseline methane calculations and measurements. Methane measurement equipment has been provided to all ALGAS countries who requested the same. The follow-up to the methane measurements workshops is a coordinated program of methane measurements among a set of ALGAS countries, for which resources have been provided under ALGAS. In this context, it must be clearly understood that the issue of methane emissions in the FCCC negotiations is politically strategic to some countries. Comments from several ITEs and NTEs support this assertion.

9. DEVELOPMENT OF GHG INVENTORIES BY THE IPCC METHODOLOGY

The NCA- as well as the NTE- and ITE-responses are that for the most part, country level human and institutional development of capacity and capability to do national GHG inventories by the IPCC methodology has taken place as aimed at as a consequence of the ALGAS project. As a result, GHG inventorying in the future can be done on a regular basis by the relevant Government agencies.

This human- and institutional capacity has been developed to the extent where some countries have been able to suggest model modifications to IPCC coefficients to be more reflective of their national situations. However, in other cases, the various coefficients have often been taken from other countries' reports or from the international literature, i.e. "the IPCC Guidelines for National GHG Inventories". This furnishes the prescribed methodology of the UNFCCC, as also of ALGAS inventory preparation. This methodology presents a number of default values of coefficients, to be used where local measurements have not yet been conducted. As a result, inventories based on such assumptions will remain unreliable. Many of the participating countries had only preliminary national GHG inventories at the start of the ALGAS project.

The ALGAS project enhanced the countries' capacities to conduct such measurements, but the actual process of exhaustively compiling such local emissions factors will take many years of research. Part of this ALGAS training also included techniques of extrapolation of measurements in other countries to the situation in one's own country, as a second best alternative to conducting one's own measurements, since these may be resource and time intensive; this is also consistent with the IPCC methodology. The ALGAS training in inventories preparation fully meets the standards expected of National Communications under the UNFCCC. As a result of the project assistance, which included a number of training workshops and seminars as well as ITE assistance, most of the ALGAS national country teams have been able to assemble their national inventories. More importantly, the countries have now established the national institutional framework to conduct subsequent updates of their GHG inventories.

The main concern expressed by the ITEs and NTEs, however, is the ability of the countries to sustain this national institutional framework post ALGAS. This concern has been reinforced as a result of the financial crisis that struck the region in the second half of 1997. The resources that the ALGAS Project provided do not allow the countries to pay for the costs of maintaining a national GHG inventory group of experts. ALGAS, being a RETA project, cannot be open-ended in its financial commitments. The periodic reporting of national GHG inventories prepared according to the IPCC methodology is

a commitment of all countries under the UNFCCC. However, in case of non-Annex 1 (including all ALGAS countries) this commitment is subject to the provision of ”agreed full costs” of the activity by the GEF. There is therefore in principle no need to apprehend that the time bound nature of the ALGAS project means that the capacity build up under the project will be lost; the UNFCCC itself ensures that funding will be available to maintain national GHG inventory teams in the future. However, without such follow-up support, it would appear reasnable to assume that much of the national institutional capacity developed by the ALGAS project will be disipated over a limited period as the trained nationals go on to work on other projects or at other institutions.

10. DEVELOPMENT OF ANALYTICAL- AND MODELING CAPABILITIES

The degree to which analytical/modeling capabilities for development of least-cost GHG abatement strategies have been developed in the participating countries varies considerably. The primary reason is the fact that these capabilities are difficult to develop, should build on existing capabilities and are very dependent on availability of basically qualified personnel. Additionally, the availability of a good data base is also essential. What can be stated is that all countries have improved their analytical and modelling capabilities significantly.

Because of the various training activities under ALGAS (workshops and TA-missions) and complementary bilateral projects, virtually every ALGAS country has at least one team that can do a complete mitigation analysis using either MARKAL or EFOM for the energy sector, and the COMAP models for the forestry sector. In addition, every team should now have the capability to formulate projects for either GEF or investment funding.

In India, Bangladesh, the Philippines and Thailand, they have been able to build on their existing capacities to accomplish more fully the goals of the ALGAS project with regard to development of least-cost abatement strategies. It should be noted that it was never the intention of ALGAS (nor would it be feasible) that NCAs would receive detailed technical training. Most NCA s do not have the requisite prior scientific background. Rather, by means of the Regional Workshops and National Workshops, it was expected that they would gain sufficient familiarity with the methodologies so that they would be able to rely on the results of NTEs research in making policy decisions.

It has been argued to this evaluator by an ITE/NTE that it may seem doubtful to use complicated models such as MARKAL and EFOM, which are in the domains of academics and research institutions, to generate results for a practical project like ALGAS, whose outputs will be read and used by policy planners and Government officials. The reason is that their familiarity with such models is weak or non-existent, and can only be established by their active participation in the project training and exercise activities as NCAs. Such participation would demand a substantial investment in NCA-personnel time, and it would hardly be realistic to expect Government authorities in poor developing countries to allocate the resources and staff needed to achieve that in such a short time.

However, counter to this argument is the fact that ALGAS uses policy analysis models. The credibility of the entire study depends critically on using formal, defensible methodologies, including analytical models. It is sufficient that the concerned

Government officials become familiar with what exactly the models are designed to do, how they are to be used, and how the results are to be interpreted. This was expected to be accomplished by the Second Regional Workshop, and the National Workshops, to which NCAs were invited. It is not necessary that NCAs have in-depth training in the structure, parametrization, and operation of the models, which are in the province of the NTEs, and which was accomplished by the detailed training workshop for each model. However, as stated in several of the above reporting documents prepared during the project, such level of NCA-participation was not always present. Provided that the NTEs would be given a chance to present and discuss their findings to their NCAs in clear and pedagogical ways, a trust could be developed whereby NCAs could leave the measurement and modelling tasks to ALGAS trained NTEs in order to have abatement options and action menues presented for the authorities to decide on. Based on the feedback and reports from the various project participants, it would be premature to assume that such relationships are now well established and sustainable. In fact, in some of the participating countries the ITEs and NTEs claim that the Government representatives (NCAs) have not taken part as assumed necessary for project implementation in the ALGAS process and thus have not contributed sufficiently to the outcome. As a result, it remains to be seen to what extent they are prepared to take on ownership of the study recommendations, and sustain the added analytical modeling capabilities that ALGAS has provided for.

11. ANALYSIS OF GHG ABATEMENT OPTIONS AND PREPARATION OF PROJECT DOCUMENTS

In the case of all project methodologies, the purpose of ALGAS was to give sufficient exposure to NCAs to appreciate what the methodologies were useful for, and their limitations, while formal skills in theoretical aspects and application were imparted to NTEs. In the case of project preparation, however, the NCAs attended the same focused training workshop, in addition to the exposure to project preparation at the Second Regional Workshop. However, of necessity, the actual work of project preparation had to be done by the NTEs, in line with the division of labour under the project.

Based on the earlier referred BTORs from the ITE-TA missions and the BTORs from the NTEs workshop participation, the ALGAS Project appears to have been successful in helping to improve human and institutional capacity for assessing GHG abatement options and identifying project opportunities in most of the participating countries. This is also true with regard to improving the capacity of the countries to prepare project pre-feasibility documents. However, the degree of this capacity varies among the ALGAS countries primarily because it is a difficult skill which requires a multi-disciplinary approach. As a result, the quality of initial project pre-feasibility documents produced by the ALGAS project to date also vary considerably. In most cases, this variation is due to the variation in general pre-ALGAS capabilities and experience of the author of the project document more so than the level of training received. Thus the project portfolios of most countries consist of both well-prepared and less-well prepared initial project documents.

This observation coincides with the NCA feedback to this evaluation questionaire: One NCA-response is that such capacity has been developed at individual and institutional levels. Another ALGAS NCA responds that whereas such capacity and capability has been developed at the research institute level, Government agencies have not followed up and as a consequence the ALGAS goal has not been achieved along this dimension. A third NCA indicates the same, although it is less clear there if the Government has in fact been upgraded to take autonomous initiatives to prepare such project documents. A fourth NCA reports that their NTE has carried out intensive analysis of GHG abatement options, and have had satisfactory presentation of project pre-feasibility documents.

It is expected that a significant improvement in the final project documents will follow from the extensive ITE- and external peer review process of the ALGAS country reports. The extent to which such achievements materialize will be investigated in the Post-Evaluation Report Volume.

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