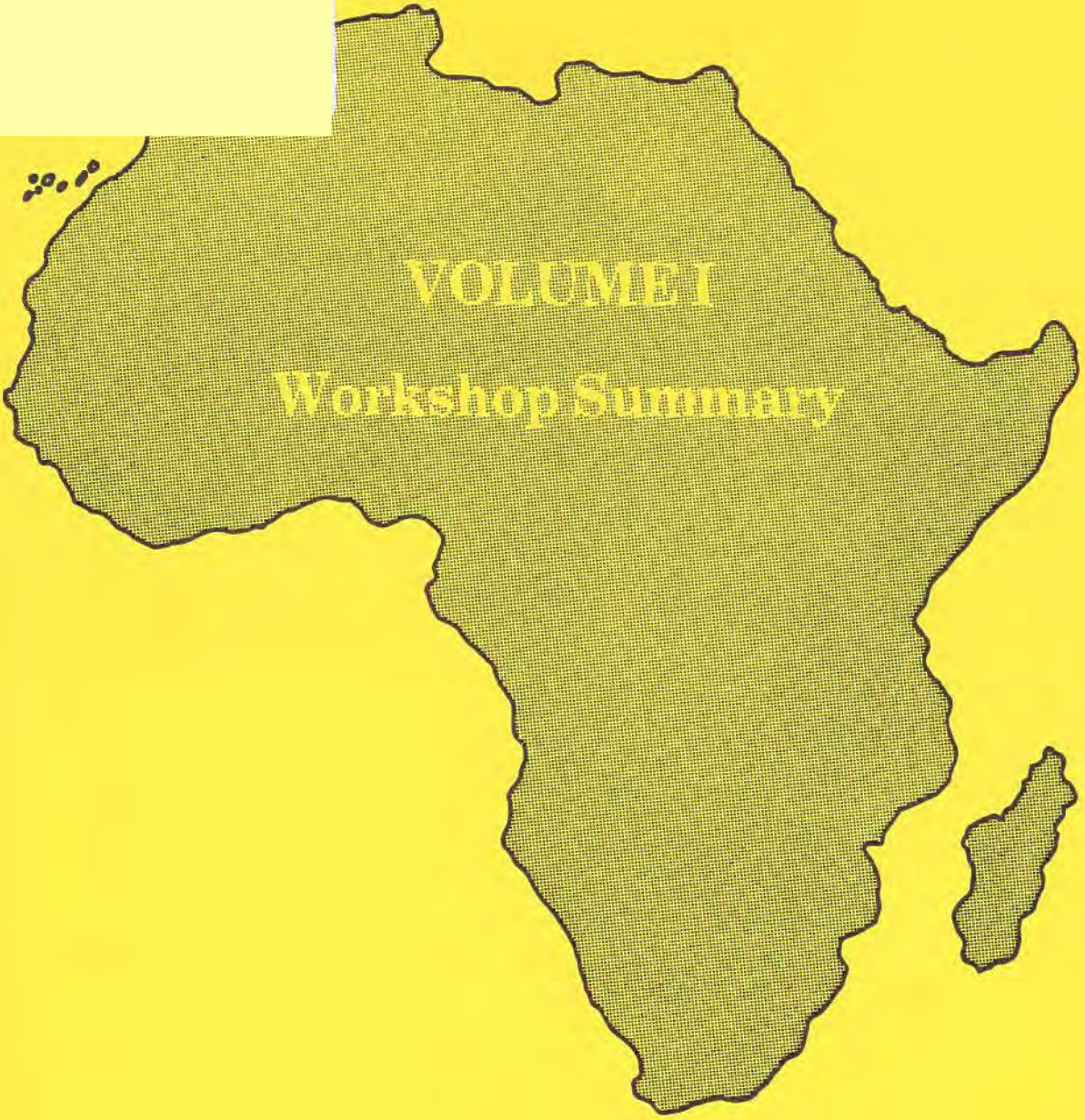
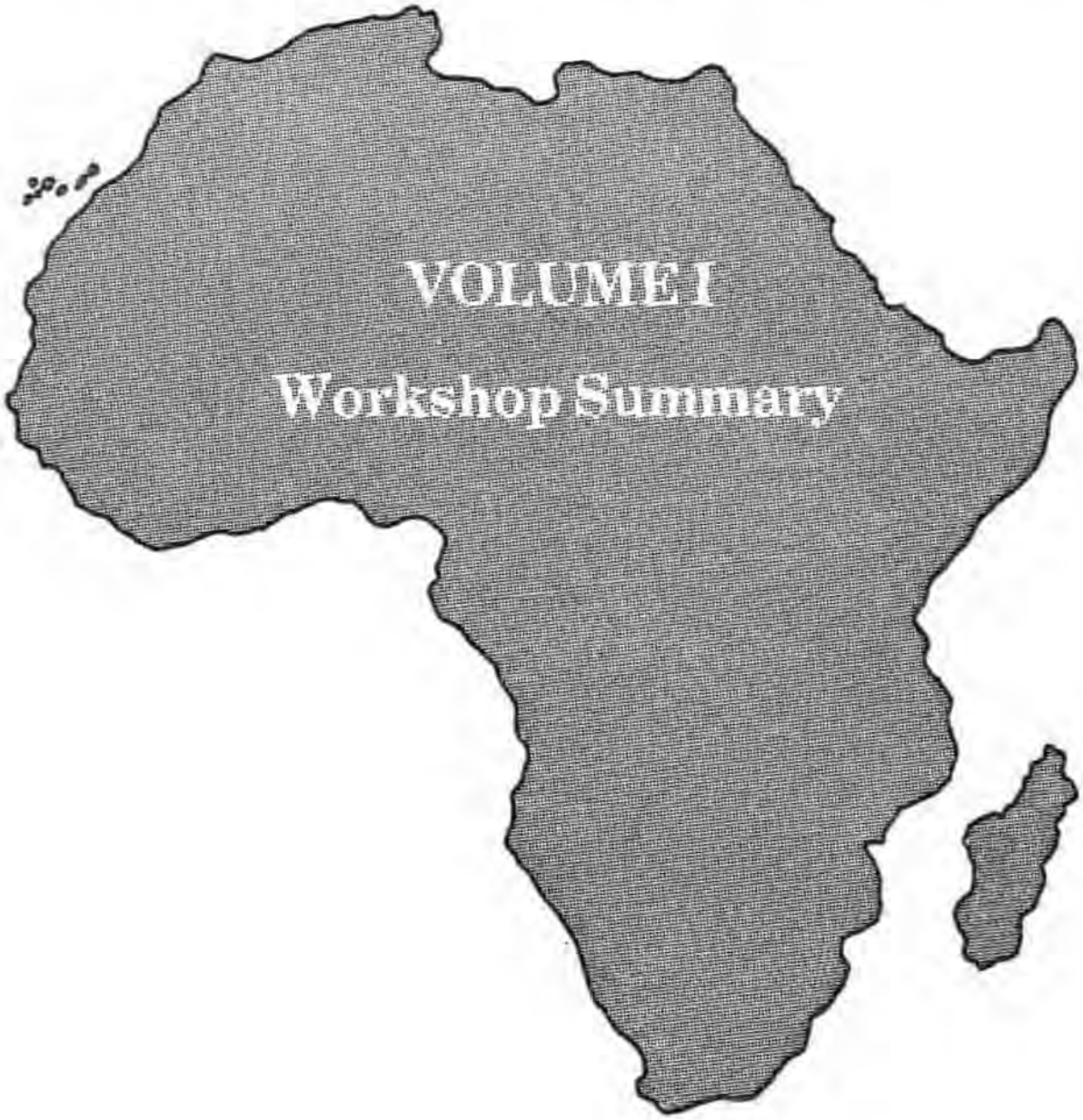
Proceedings of Workshop on Energy, Forestry and Environment



Bureau for Africa
Agency for International Development

April 1982

Proceedings of Workshop on Energy, Forestry and Environment



Bureau for Africa
Agency for International Development

April 1982

Proceedings of
Workshop on Energy, Forestry and Environment

Volume: I Workshop Summary

Volume I includes the Workshop Report as prepared by the participants, a strategy for action and recommendations to the Assistant Administrator of the Bureau for Africa for implementing the strategy. In addition, there is information on the history of the Bureau for Africa's energy, forestry and environment programs.

Volume II: Discussion Papers/Case Studies

Volume II includes the 41 discussion papers and case studies which were prepared for the workshop.

Volume III: Country Energy Papers

Volume III includes the energy profiles of 21 African countries. The papers were prepared by energy, forestry and environmental officers of AID field offices.

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PROCEEDINGS OF

WORKSHOP ON ENERGY, FORESTRY AND ENVIRONMENT

VOLUME I: WORKSHOP SUMMARY

FOREWORD

On July 14, 1981, the Assistant Administrator, Bureau for Africa, approved a memorandum authorized the funding for a workshop in Africa on energy, forestry and environment in Africa. This action initiated a process of organization and planning that culminated in Nairobi in December with the attendance of some 80 participants. About half were energy, forestry and environmental officers drawn from 20 AID field missions. The other half consisted of AID/W officers and subject matter specialists, expatriate and African, from both the public and private sectors.

The goals of the Workshop may be summarized as follows:

- to learn from field staff what issues seemed primary and how they should be addressed;
- to improve current information on designing and implementing projects in energy, forestry and environment;
- to present the Assistant Administrator with recommendations on how the Agency might proceed in the area of energy, forestry and environment.

Planning a Workshop to achieve these goals was not easy. One issue faced from the start was how to treat meaningfully, and not superficially, the Workshop's three complex and interrelated topics over a period of less than five days. A second was how to strike the right balance between formal presentations, panel sessions and small group discussions. A third was to achieve a proper mix between the wisdom or views imparted by the visiting experts and the sharing of practical experience and ideas among the participants from the field. These and other issues were the subject of lively debates as the planning process proceeded -- debates to which the views of the REDSOs and the field missions made substantial and valuable contributions.

How these issues were resolved may be seen from the agenda that appears in this volume of the proceedings. Initial sessions were devoted to setting the stage and outlining the context of the leading energy, forestry and environmental issues in Africa. This introduction was followed by presentations and panel sessions on approaches, techniques and methodologies for analyzing and addressing those issues. Then, in the latter days of the Workshop, sessions emphasized field experience and lessons learned from the success or failure of specific interventions. Meanwhile, four discussion groups, comprised of field participants, had been formed on a roughly sub-regional basis: Southern Africa, East Africa, the Sahel, and West/Central Africa. During evening sessions, these discussion groups reviewed the country energy papers which had been prepared by the missions in advance (see Volume III) and prepared reports on how AID should address Africa's energy, forestry and environmental problems. The four discussion group reports, synthesized into a Workshop Report to the Assistant Administrator, then became the main topic for the Workshop's final plenary session. It appears in this volume of the proceedings and incorporates the major suggestions made at that session.

Was this expenditure of funds, time and effort worthwhile? If one looks over the reaction of the field participants, as indicated in the evaluation forms that they turned in, the consensus is distinctly positive (see evaluation statement on page xx of this volume). There was particular enthusiasm for the sessions devoted to exchanging field experience and the discussion group meetings.

From an AFR/DR perspective, the Workshop was both an enlightening and sobering experience. It was enlightening because of the broad range of insights and expertise that the Workshop generated, making possible a greater sense of comprehension of the topics and issues under discussion. It was sobering because it made even clearer than ever how critical and deep rooted Africa's energy, forestry and environmental issues are, and how far Africans and donor agencies must go to make an appreciable impact upon them.

Over the longer run, the value of the Workshop may be judged by the extent to which its wisdom and recommendations filters into the consciousness and actions of the Bureau's field missions and Washington decision makers. If it is successful in starting a process which causes the Bureau to give greater attention to Africa's energy, environmental and forestry concerns, it will have been indeed a worthwhile exercise.

ACKNOWLEDGEMENTS

The organizers of the Workshop on Energy, Forestry and Environment wish to thank the participants whose hard work and high quality of ideas made the workshop successful.

Mr. John D. Blumgart, Chief, Special Development Problems, AFR/DR and his staff -- Sally Patton, Mark Ward, Kevin Mullally, James Hester and Ruth Wilson -- also wish to thank the host Mission, USAID/Nairobi, under the direction of Allison Herrick. We particularly would like to single out the support given by John Greenough, Administrative Officer, and his staff member, Catherine Varley, who by copying numerous late arriving documents, allowed the Workshop to get off to a smooth start.

In addition, many substantive technical contributions to the format and agenda were provided by REDSO/EA. Director Ray Love generously lent the services of Weston Fisher, Energy Advisor; John J. Gaudet, Science Technology and Environment Advisor; and James Seyler, Forestry Advisor. We are also grateful to Daniel Creedon, PM/TD, and his staff, particularly Dr. Gene Ellis, for their contribution in helping us with the agenda. And last but not least, we wish to thank John C. Engle of Development Assistance Corporation, his Washington staff, Denise F. Thomas and Arnet W. Jones, his Nairobi staff, Bettina Paolozzi and Sandy Armstrong, for their management and support throughout.

AGENDA

WORKSHOP ON ENERGY, FORESTRY AND ENVIRONMENT

Hotel InterContinental - Nairobi

OPENING SESSION, SUNDAY, DECEMBER 6, 1981

5:30 Registration
Social Hour

7:00 Introduction of the Head Table by
Conference Convenor - John D. Blumgart

Address
Ambassador William C. Harrop
U.S. Ambassador to Kenya

7:30 Dinner

8:30 Workshop Format and Expectations
John D. Blumgart, Chief
Special Development Problems, AFR/DR

Assistant Administrator's Remarks
F.S. Ruddy, Assistant Administrator,
Bureau for Africa

DAY 1, MONDAY, DECEMBER 7, 1981

PROGRAM CHAIRMAN - Stephen Klein

MORNING PLENARY - OVERVIEW AND ISSUES

8:30 - 9:15 World Energy and the Developing Countries

James W. Howe, President, IRES

Discussion

9:15 - 10:00 Energy Issues in Africa

William Mbote, Managing Director
Kenya Pipeline Company

Discussion

10:00 - 10:30 Break

10:30 - 11:30 The Forestry/Fuelwood Problem in Africa and its Environmental Consequences

Marc Rene de Montalembert
Forestry Department
FAO

E.M. Mnzava
Director of Forestry
Ministry of Natural Resources and Tourism
Government of Tanzania

Discussion

11:30 - 12:15 Energy Trade-Offs in Africa: Laying out the Issues

Gene Ellis
University of Denver

12:15 - 12:45 Discussion

AFTERNOON PLENARY - ISSUES AND RESPONSES

2:00 - 3:45 Panel: Addressing the Energy and Environmental Problem in Africa: Role of the Private Sector, World Bank and Bilateral Donors.

Introduction	John D. Blumgart
Private Sector	Colin Carter
IBRD & Other Donors	John D. Blumgart
AID	Blumgart/Klein/Jacobs/Feldman
Peace Corps	Paul Jankura
ECOWAS	Clarence Kooi/Mark Ward

3:45 - 4:00 Coffee Break

4:00 - 5:00 The Role of National Energy Assessment and Conventional Energy Planning

Asif Shaikh
Energy/Development International

Colin Carter, V.P.
Energy Economics
Chase Manhattan Bank

5:00 - 5:30 Discussion

DAY 2, TUESDAY, DECEMBER 8, 1981

PROGRAM CHAIRMAN - Gene Ellis

MORNING PLENARY

8:30 - 10:00 Panel: Assessing Energy Environment and Forestry Sectors

Richard Ford	ETMA
Weston Fisher	Energy Advisor, REDSO/EA
John J. Gaudet	Science, Technology and Environment Advisor, REDSO/EA
James Seyler	Forestry Advisor, REDSO/EA
Vernita Fort	Natural Resources Advisor, REDSO/WA
James Hester	Environmental Officer, AFR/DR

10:00 - 10:30 Discussion

10:30 - 11:00 Break

11:00 - 11:45 Private Sector Investment Analysis: What the private sector needs to know before investing in African resource development; Africa's relationship with multinationals

William Mbote
Kenya Pipeline Company

Carol Sakoian
Conoco, Inc.

11:45 - 12:30 Discussion

AFTERNOON PLENARY

2:00 - 4:15 Panel: Analytical Tools for Project Design

Introduction	Gene Ellis
Cost/Benefit Analysis	Asif M. Shaikh
Technical Soundness	Clarence Kooi
Social Soundness	Carolyn Barnes
Environmental Implications	Vernita Fort
Monitoring and Evaluations	George Burrill

4:15 - 4:45 Discussion

4:45 - 5:30 The Role of Remote Sensing in Resource Management

Merrill Conitz
Allan Falkoner
Regional Remote Sensing Facility

5:30 - 5:45 Instructions to Discussion Groups

John Blumgart
Gene Ellis

EVENING SESSION

7:00 - 9:00 Country Papers Exercise (discussion groups)
Leaders: Phil O'Keefe/Asif Shaikh
George Burrill/Mark Ward

9:00 - 9:30 Discussion groups compose their summaries and conclusions

DAY 3, WEDNESDAY, DECEMBER 9, 1981

Discussion Group Sessions (Participants will break into two groups)

PROGRAM A. National Energy Assessments, Energy Management Policy and Planning
Discussion Leader: Asif Shaikh

8:30 - 9:30 Experience in Kenya and Sudan

Kenya	Phil O'Keefe
Sudan	Mike Bess

9:30 - 10:15 Discussion

10:15 - 10:30 Break

10:30 - 11:30 Rural and Urban Energy Surveys

Peace Corps Experience	Paul Jankura
Malawi	Richard Scobey
Kenya	Phil O'Keefe

11:30 - 12:00 Identification of Problems and Potential Solutions

1:30 - 5:00 Program repeats with next group

PROGRAM B. Energy Technologies
Discussion Leader: Clarence Kooi

8:30 - 9:00 Overview of Energy Technology Project Possibilities

Clarence Kooi

9:00 - 11:30 Discussions of Various Energy Technogies

Oil and Coal Development Technologies	Carol Sakoian
Geothermal	S.O. Bwire
Energy Conservation	Mike Jones
Mini-Hydro	Allen Inversin
Solar	Clarence Kooi
Wind	Mike Harries
Charcoal/Wood Stoves	Tim Wood
Charcoal Conversion	Keith Openshaw
Biomass	Keith Openshaw

11:30 - 12:00 Identification of Problems and Solutions

1:30 - 5:00 Program Repeats with next Group

NOTE: The following manufacturers will exhibit in room for program:

Jiko Stoves
Animatics, Ltd.
East African Hydraulics
Solar Electric International
Kijito Windmills
Kahawa Coal

EVENING SESSION

DAY 3, WEDNESDAY, DECEMBER 9, 1981

7:30 - 9:00 Discussion of "Energy Initiatives for Africa"

Project Paper - Mary Ann Riegelman, AFR/RA

DAY 4, THURSDAY, DECEMBER 10, 1981

PROGRAM C. Renewable Energy Center Project Management
Discussion Leader: Mark Ward

8:30 - 11:30 Highlights of AID experience.

Lesotho	Jay Stryker
Kenya	Joseph Pastic
Mali	Jon Anderson
Senegal	Carol Ulinski
Burundi	Abbe Fessenden

11:30 - 12:00 Identification of Problems and Potential Solutions

1:30 - 5:00 Program Repeats with next Group

PROGRAM D. Forestry and Natural Resource Protection
Discussion Leader: Richard Ford, ETMA

8:30 - 9:00 Environmental Issues

Richard Ford, ETMA

9:00 - 9:45 Reforestation Case Study: Gujarat Project

R. Java

9:45 - 10:30 Highlights of AID's experience in Reforestation and Natural Resource Management

Sahel	Bob Winterbottom, AID/Ouagadougou Kevin Mullaly, AFR/DR
Range Management	Vernita Fort, REDSO/WA
Senegal	David Gibson, AID/Dakar
Mali	Jon Anderson, AID/Bamako
Niger	John Heermans, AID/Niamey

10:30 - 10:45 Coffee Break

10:45 - 11:00 The CDA Forestry/Fuelwood Initiative

Kevin Mullaly, AFR/DR

11:00 - 11:30 Agroforestry and ICRAF

Bjorn Lundgren, ICRAF

11:30 - 12:00 Identification of Problems and Solutions

1:30 - 5:00 Program repeats with next group

EVENING SESSION

DAY 4, THURSDAY, DECEMBER 10, 1981

7:30 - 9:00 Working session for discussion group participants and group leaders only. Purpose is to prepare issues for presentation to be made on Friday morning.

DAY 5, FRIDAY, DECEMBER 11, 1981

MORNING WORKSHOP WRAP-UP

Program Chairpersons: Herrick and Love

8:00 - 10:00	Presentation of project program and policy issues and recommendations by the spokespersons of the four working groups.
10:00 - 10:15	Break
10:15 - 12:00	Discussion of Draft Report
12:00 - 12:15	Closing Remarks of the Convenor - John D. Blumgart

(During afternoon, drafting committee prepared revised Workshop Report to AA/AFR, based on morning's discussion)

2:00 - 5:00	Field Trips to Regional Remote Sensing Facility Clayworks/Kijito Windmills ICRAF Agroforestry Athi River Wildlife Ranch

WORKSHOP ON ENERGY, FORESTRY AND ENVIRONMENT
PARTICIPANTS AND SPEAKERS

NAIROBI, DECEMBER 6-11, 1981

Jon Anderson
USAID/Bamako
Department of State
Washington, D.C. 20520

Ken Barber
Peace Corps
c/o American Embassy
Dakar, Senegal

Dr. Carolyn Barnes
REDSO/EA
Box 30261
Nairobi, Kenya

Quincy Benbow
USAID
American Embassy
Banjul, The Gambia

Dean Bernius
USAID
P.O. Box MS 333
Maseru, Lesotho 100

Gordon Bertolin
USAID
B.P. 35
Ouagadougou, Upper Volta

Mike Bess
Ministry of Energy
Khartoum, Sudan

Peter Bloom
REDSO/EA
P.O. Box 30261
Nairobi, Kenya

John D. Blumgart
AFR/DR
Agency for International Development
Washington, D.C. 20523

H.L. Braddock
USAID
c/o American Embassy
Kinshasa, Republic of Zaire

Louise Buck
ICRAF, Box 30677
Nairobi, Kenya

George Burrill
Associates in Rural Development
362 Main Street
Burlington, VT. 05401

David W. Carr
USAID
B.P. 222
Nouakchott, Mauritania

Colin P. Carter
1 Chase Manhattan Plaza
Chase Manhattan Bank
New York, N.Y. 10081

Louis A. Cohen
USAID
P.O. Box 90
Gaborone, Botswana

Merrill Conitz
REDSO/EA
P.O. Box 30261
Nairobi, Kenya

Gene Ellis
2421 So. High
Denver, CO 80210

Julien Engel
ETMA West Africa Representative
c/o REDSO/WA
Abidjan, Ivory Coast

John C. Engle
Development Assistance Corporation
1415 11th Street, N.W.
Washington, D.C. 20001

Allan Falconer
Regional Remote Sensing
P.O. Box 18118
Nairobi, Kenya

Sharon Fee
USAID
c/o American Embassy
Mogadishu, Somalia

William M. Feldman
Office of Forestry, Environment
and Natural Resources
S&T Bureau, AID
Washington, D.C. 20523

Abbe Fessenden
USAID/Bujumbura
Department of State
Washington, D.C. 20520

Hal Fisher
USAID
B.P. 1720
Bujumbura, Burundi

Weston Fisher
REDSO/EA
P.O. Box 30261
Nairobi, Kenya

Richard Ford
National Environment Secretariat
P.O. Box 67839
Nairobi, Kenya

Vernita Fort
REDSO/WA - USAID
B.P. 1712
U.S. Embassy
Abidjan, Ivory Coast

John J. Gaudet
REDSO/EA
P.O. Box 30261
Nairobi, Kenya

Amare Getahun
E/DI (MOE)
P.O. Box 62360
Nairobi, Kenya

David Gibson
USAID c/o American Embassy
Dakar, Senegal

Julian M. Goodwin
Animatics Ltd.
P.O. Box 72011
Nairobi, Kenya

Samuel Hale
Energy/Development International
1110 Vermont Ave., N.W. Suite 428
Washington, D.C. 20005

Thomas C. Hart
Ecosystems, Ltd.
Box 30239
Nairobi, Kenya

Ronald Harvey
USAID, P.O. Box 9130
Dar es Salaam, Tanzania

John G. Heermans
B.P. 201
Niamey, Niger

Allison Herrick, Director
USAID/Kenya
P.O. Box 30261
Nairobi, Kenya

James Hester
AFR/DR
Agency for International Development
Washington, D.C. 20523

James W. Howe
International Renewable Energy Service
1707 H St. N.W., Suite 1015
Washington, D.C. 20012

Allen Inversin
NRECA
1800 Mass. Ave., N.W.
Washington, D.C. 20036

Alan B. Jacobs
Office of Energy
S&T Bureau, AID
Washington, D.C. 20523

Paul Jankura
Peace Corps
806 Connecticut Ave., N.W.
Room 701
Washington, D.C. 20525

Ramesh L. Java
Conservator of Forests
Training Research & Communication
Wadia Palace, Rajpipla
Gujerat, India

Mike Jones
P.O. Box 62360
Nairobi, Kenya

Phil Jones
Peace Corps
Nairobi, Kenya

Isengingo Kambere
S.P.E.
P.O. Box 9797
Kinshasa, Zaire

Stephen Klein
Energy Advisor
Agency for International Development
Washington, D.C. 20523

Dan Kohler
The Rand Corporation
1700 Main Street
Santa Monica, CA 90406

Clarence Kooi
B.P. 1712
REDSO/WA
Abidjan, Ivory Coast

Ray Love, Director
REDSO/EA
P.O. Box 30261
Nairobi, Kenya

Lewis Lucke
USAID
B.P. 34
Bamako, Mali

W.N. Mbote
Kenya Pipeline Co.
Box 50882
Nairobi, Kenya

Cheryl McCarthy
USAID
C.D. 297
Bissau, Guinea Bissau

Stephen P. McCarthy
Peace Corps
P.O. Box 5796,Accra North
Accra, Ghana

Elizabeth Miller
158D Old Church Lane
Pound Ridge, N.Y.

E.M. Mnzava, Director
Forest Division
Box 426
Dar es Salaam
Tanzania, East Africa

Marc Rene de Montalembert
Forestry Department
FAO
via delle Terme di Caracalla
00100 Rome Italy

Eugene Morris
c/o USAID
P.O. Box 750
Mbabane, Swaziland

Mohamed El Amin Mukhtar
Energy Administration
Ministry of Energy & Mining
Khartoum, Sudan

Kevin J. Mullally
AFR/DR
Agency for International Development
Washington, D.C. 20520

Dick Mullaney
Peace Corps
P.O. Box 93
Gaborone, Botswana

David S. Muturi
Ministry of Energy
P.O. Box 30582
Nairobi, Kenya

Phil O'Keefe
Beijer Institute
P.O. Box 30582
Nairobi, Kenya

Jon O'Rourke
AID/Zambia
c/o Department of State
Washington, D.C. 20520

Norman L. Olsen
USAID
B.P. 28, American Embassy
Kigali, Rwanda

Keith Openshaw
Beijer Institute
Box 30582
Nairobi, Kenya

Joseph Pastic
USAID
P.O. Box 30261
Nairobi, Kenya

Sally Patton
AFR/DR
Agency for International Development
Washington, D.C. 20523

H. Pressl
P.O. Box 14698
Nairobi, Kenya

Mary Ann Riegelman
AFR/RA
Agency for International Development
Washington, D.C. 20520

Raymond F. Rifenburg
USAID
B.P. 817
Yaounde, Cameroon

Francis S. Ruddy
AA/AFR
Agency for International Development
Washington, D.C. 20523

Carol Sakoian
Conoco, Inc.
High Ridge Park
Stanford, Conn. 06904

Richard Scobey
Box 30134
Lilongwe 3, Malawi

James Seyler
REDSO/EA
P.O. Box 30261
Nairobi, Kenya

Satish P. Shah
USAID
P.O. Box 30261
Nairobi, Kenya

Asif M. Shaikh
Energy/Development International
1110 Vermont Ave., N.W., Suite 428
Washington, D.C. 20005

Lynn C. Sheldon
USAID
Box 119 American Embassy/Sudan
APO, New York 09668

W. Brooke Stallsmith
AAO, American Embassy
B.P. 28
Kigali, Rwanda

Jay W. Stryker
USAID, Box 333
Maseru, Lesotho

Bye-Mass Taal
c/o Forestry Dept.
5 Marina Parade
Banjul, Gambia

Paul Tuebner
Peace Corps
P.O. Box 90
Gaborone, Botswana

Carol Ulinski
USAID
c/o American Embassy
Dakar, Senegal

Charles Uphaus
USAID
c/o American Embassy
Freetown, Sierra Leone

Mark Ward
AFR/DR
Agency for International Development
Washington, D.C. 20520

Bob Winterbottom
Bobo-Dioulasso - USDA
c/o USAID
Ouagadougou
Upper Volta

Tim Wood
CILSS
B.P. 7049
Ouagadougou, Upper Volta

Lee Yellott
Peace Corps
B.P. 971
Cotonou, Benin

OPENING REMARKS

John D. Blumgart, Chief
Special Development Problems
Bureau for Africa
Agency for International Development

It is with great pleasure and anticipation that I welcome all of you to the Bureau for Africa's Workshop on Energy, Forestry and Environment. Its authorization and funding was among the early decisions of our new Assistant Administrator, Mr. Ruddy. In fact, this gathering represents the first time that our Bureau has convened a workshop on these topics. That we are about to do so demonstrates, I believe, a growing recognition by the Bureau that energy, forestry and environmental problems are critical factors in the development of Africa and that they must receive increased attention by both our field missions and by Washington.

Before proceeding further, I want to point out that this meeting would not have been possible without the collaboration and hard work of many of you both in Washington and the field. I particularly want to thank USAID/Nairobi for the logistical support it has generously provided through Mr. Greenough and his staff from the very beginning of our preparations. In addition, major substantive contributions to the topics and to the structure of our program were provided by both REDSOs, especially by their Energy and Environmental Officers. Thirdly, we have received indispensable help of both a substantive and administrative nature from two consultants, John Engle of the Development Assistance Corporation and Gene Ellis of the University of Denver. Gene's services have been generously provided by AID's Office of Training. Finally, I would like to take the opportunity to thank the staff of my office who have devoted most of their time and energies over the past 3 months to what seemed like an unending series of tasks and challenges.

Although we will all be introducing ourselves to each other at our opening session tomorrow morning, I do want to take this opportunity to welcome AID's Energy Policy Advisor, Steve Klein of the Policy and Planning Staff, who has been a source of strength and support to the Bureau on countless occasions, including when we needed more money. I want to equally welcome the Directors of the two Offices of the Bureau for Science and Technology with which our own Bureau directly interfaces when it is addressing questions of energy, forestry and the environment. Their presence here, despite almost paralyzing travel fund restrictions, is evidence of the priority which the heads of their Bureau -- Niles Brady and Leonard Yaeger -- attach to these subjects and to collaborating with us about them. I would also like to welcome Mary Ann Riegelman from our Regional Affairs Office who will be leading a discussion of the proposed Energy Initiatives for Africa project on Wednesday evening.

As I just mentioned, the Workshop program that we have developed is very much a joint product -- the product of a lively dialogue that took place

between Washington and the field. The result is an ambitious and very rich menu of plenary and discussion group sessions.

We begin tomorrow morning with a series of overview analyses to provide a framework of the dimensions of the problem and what various agencies, including AID, are doing about it. On Tuesday we move into a more specific examination of a number of key topics and issues which must be dealt with if we are serious about trying to address energy, forestry and environmental problems in Africa. Thanks to REDSO/EA's initiative, it has taken the lead in organizing the first of these Tuesday sessions -- the one titled "Assessing Energy, Environment and Forestry Sectors."

On Tuesday evening, from seven to nine, we first form our four Discussion Groups. These have been roughly organized by region and ecologic similarity, although some exceptions had to be made to keep the groups roughly the same size. The Discussion Groups will meet with their group leaders in the rooms that have been designated. Phil O'Keefe of the Beijer Institute is the leader of the East Africa group, Asif Shaikh of Energy/Development International will head the Sahel group, George Burrill of Associates in Rural Development will lead the Southern Africa group and Mark Ward, the Bureau's Energy Advisor, will head the West/Central Africa group.

The Tuesday evening session will be devoted to a discussion of the country energy statements that we have asked you to prepare and bring to the workshop. We will be duplicating these papers for distribution tomorrow. It is important that you read the papers of your fellow group members before the Tuesday evening session so that you will be prepared to comment on them.

On Wednesday and Thursday we will continue in the discussion group mode with each group going through a half-day program of more specialized topics. Program A is concerned with energy planning and energy surveys. Program B takes up the practicalities of managing and implementing energy projects, and what we learned from our experience. Program C examines an array of various energy technologies and their capability to deal with specific energy problems. Program D addresses the whole range of issues concerned with forestry and natural resource management and our experience to date with projects in that sector.

I would like to emphasize that the purpose of the Discussion Group meetings is not only to provide information to our field missions on these topics -- although that is a very important objective in itself. The even more important objective is to obtain the reaction, experience, opinions and wisdom of our bilateral field missions on these issues. Therefore, participation by our bilateral mission personnel is the key to the success of the Discussion Groups.

Those persons not assigned to Discussion Groups should feel free to sit in on the Discussion Group programs and discussions. However, I would ask such persons to limit their participation and refrain from dominating the discussions with their technical expertise. Clearly our technical experts and visitors should provide advice on technical points when this information is needed by the Discussion Groups. But I would

caution them to think of themselves as servants rather than as guides of the Discussion Groups. Otherwise, I am very afraid the discussions will become overly influenced by outside experts and distinguished visitors, and we will lose the field orientation and expression of views that we want to obtain from the Discussion Groups.

The evening session on Thursday is being held so that Discussion Groups may continue to work on their reports for the Friday plenary session. We may again wish to use that time to ask the energy experts to be available to our mission people for individual consultations.

Friday morning is the day when all that has preceeded is summarized in a workshop report. We will be looking to the Discussion Groups -- through their spokepersons -- to present their views as to the leading project, program and policy issues the Bureau faces in the fields of energy, forestry and the environment, and their recommendations as to what the Bureau should do about them. We will be getting, I believe, further guidance on these points very shortly from Mr. Ruddy. It is our expectation that during the Friday presentations and discussions we will be able to reach a consensus that will provide the basis of a report by the Workshop to Mr. Ruddy -- a report that will articulate your views on the issues and your recommendations as to how we should proceed.

Once again, let me welcome all of you to this workshop and to thank those of you who have done so much to make it possible and who will be working with me over the next few days to help us to realize the Workshop's potential.

I would now like to turn the chair over to Mr. Ruddy.

OPENING REMARKS

Francis S. Ruddy
Assistant Administrator
Bureau for Africa
Agency for International Development

Mr. Ambassador, Mr. Muturi, Mr. Mbote, Directors Herrick and Love, distinguished visitors and all my AID colleagues from our African Missions and from Washington. John Blumgart, Convenor of this Workshop, has told you that authorizing this Workshop was one of my early decisions as Assistant Administrator of the Bureau for Africa. I made that decision for several reasons.

I come to this job from an energy background and for the past few years I have followed closely our own country's struggle to accommodate the legitimate and farsighted demands of conservationists under the National Environmental Protection Act and the nation's need for energy to get us to the year 2000 and I have been part of the litigation and strategy of that debate.

As I travel through Africa, I see at firsthand Africa's energy forestry and environmental problems -- I see that cars cannot be driven on Sunday in Tanzania because there is not enough petrol, even at $5.00 a gallon. I have seen desertification in Senegal and I have seen an ever widening circle of trees cut down for firewood around Ouagadougou.

Peter McPherson has urged that AID should increase the total level of funding devoted to energy-related activities in the years to come. President Reagan, in his recent Philadelphia speech, has singled out energy activities as an area for practical proposals for cooperation between the United States and developing countries.

For these reasons, I wanted to be here to participate with you during the first few days of this Workshop and to learn more about the nature and significance of these problems from you the real experts, to hear what you have been doing to solve them and, above all, to think about how we can do better and how we can do more.

As I am new to AID, I learned quite a bit from the background paper that John has prepared for this meeting. It describes the origins and evolution of the Bureau for Africa's energy, forestry and environmental activities and summarizes their status. I am sorry to have to say that while our renewable energy and fuelwood programs more than tripled between FY'78 and FY'81 (from $5 million to $16 million), they show a decline in this fiscal year and an even further decline in FY '83.

Why is this? Certainly it is not because we have solved Africa's energy problem and can turn to other matters. And how does this trend in '82 and '83 square with the Administrator's guidance to "increase significantly" our energy-related activities? I really will look to

this Workshop for answers to how we can do more in energy with less money.

One thing that I have learned since joining AID is that AID -- in contrast to most other donor agencies -- is decentralized. In AID the center of gravity for decision making at the operational level lies heavily with the field missions in conjunction with their host country governments -- and that's the way it should be. We in Washington, can set the tone and the general direction of our programs. But the translation of such guidance into specific activities and projects depends on the initiative of the Missions and their host country counterparts.

That's the real significance of this kind of Workshop. If it works, it will really affect the Bureau's thinking about energy reforestation and environment and directly influence my decisions on the Bureau's programs in energy, forestry and the environment over the next several years.

We have assembled here in Nairobi some of the world's leading experts on energy, reforestation and the environment in Africa. We have also started a process of self-instruction, of learning the lessons about our successes and failures through the case studies that you have prepared. All of us should come away from this meeting with a better base of knowledge and understanding for dealing with the topics on our agenda.

Secondly, this Workshop is a means of coming to grips with a broad range of issues that confront the Bureau, and of generating programs to deal with them. We scheduled this meeting in December to allow time for Missions to consider what has been learned and to incorporate these ideas into the 1984 ABS program submissions due next May. In this connection, I invite your attention to the list of Workshop issues which the conference organizers have prepared in order to get the dialogue going. That list was prepared in AID/W and our people in the field will undoubtedly have others to add. Let's get them on the table and see if we can reach a consensus on how to address them.

In our discussions, I hope you will give attention to the question of private sector participation in our energy, forestry and environmental programs. And by "private sector" I do not mean only U.S. private investment or the involvement of African commercial and industrial sectors. In some cases it may be American private investment, but in others it may be the skills, energies and resources of the vast rural, village and urban populations of Africa who represent a great source of entrepreneurship. The initiative of these resources can play a role in addressing Africa's energy, forestry and environmental problems. Clearly, to do so means developing technologies, policies and approaches that are affordable, profitable and practical.

We expect a lively and spirited discussion of these issues and I will be very anxious to see the consensus report on Friday, the last day of our Workshop. Unfortunately, on that day I shall be in Somalia. Nevertheless, I want to emphasize the importance I attach to your report that will summarize your views and recommendations on the issues and on the Bureau's future work in energy, forestry and the environment. I

look upon this Workshop as the beginning of a process that will provide new impetus and dynamism to our work in these fields. I am looking to John Blumgart to bring back your views, and I assure you I will use them as a basis for action.

I wish you well in your labors and I look forward to receiving your report. Thank you.

AFR ENERGY, FORESTRY AND ENVIRONMENT PROGRAMS

OVERVIEW AND ISSUES

This paper was prepared for the Workshop on Energy, Forestry and Environment to outline the historical context of the Bureau for Africa's programs in these areas. It summarizes their current status, notes complementarities and differences with AID centrally-funded programs, and identifies issues which merit discussion and recommendation.

Program Origin

The origins of the Bureau's programs in energy and environment go back to an informal "planning group" that was set up in AFR/DS (the forerunner of AFR/DR) which attempted to look at some of the longer run issues of development in Africa. The group identified the interrelated problems of rural energy needs and environmental degradation as among the most serious facing African countries over the next two decades.

As a result the Bureau initiated two activities. The first involved a grant to Clark University to fund a series of pilot programs in several East and Southern African countries aimed at strengthening local capacity to deal with environmental problems. The second involved a grant to the Overseas Development Council (ODC) to prepare a concept paper on how the Bureau might begin to address Africa's rural energy needs. These initiatives took place against a background of growing concern in AID and in the Congress on environmental issues as a result of the 1969-1974 drought in Africa and the realization that more attention and resources should be devoted to the energy dimension of AID's "New Directions".

Renewable Energy

The ODC study, "Energy for the Villages of Africa", published in early 1977, noted that 85% of the 250 million people of sub-Sahara Africa "live out their lives (in rural areas) without more than occasionally being touched by modern energy". It noted that the "chief sources of energy for most of these people are human muscle power, wood, and the rays of the sun". It asked whether the tasks of these people might be lightened and their productivity increased by "technologies that are now on the shelf or emerging from the laboratory".

The report suggested an approach by which Africa policy makers and donors could try to determine "whether village-source energy systems warrant use on a wide scale" and, if so, how best to select appropriate technologies and what kind of support systems they would require. To answer these questions the report recommended a series of activities involving (a) the identification of tasks villagers wish to have performed by non-human energy, (b) evaluate the energy resources available (sun, wind, stream flows, wood, crop residues) for performing tasks, (c) install and operate appropriate devices and measure the technical performance of the technologies introduced, (d) evaluate

performance, local acceptance, cost, economic feasibility and maintenance and repair requirement of such hardware and (e) examination of how best to extend successful systems, including particularly the utilization of the private sector.

The report further recommended the training of African energy experts and the strengthening of African energy-related institutions. It also urged a stepped-up program of small-scale decentralized renewable energy research, both in the U.S. and, with AID support, in Africa.

Early Starts

The ODC report, which was circulated in both English and French versions, provided the initial impetus and direction to AFR's renewable energy program. In FY '78, projects were launched or designed in Mali, Senegal and Niger (initial emphasis was placed on the Sahel) which sought to apply the report's directions and methodology. For example, the project in Mali involves building up the institutional and technical capcbility of the Mali Solar Energy Laboratory while simultaneously carrying out village energy surveys in four ecological zones of the country to determine village energy priorities and resources. The survey results are meant to help guide the R.& D. work of the laboratory toward technologies relevant to the needs of its rural "clientele" and their financial and technical capabilities.

Forestry and Fuelwood

Along with the Bureau's increased emphasis on renewable energy, there was a growing concern with Africa's fuelwood/deforestation problem. Concurrently with a State/AID conference on the global dimensions of the problem, the Bureau sponsored in June, 1978 an Africa firewood workshop which sketched out the dramatic magnitude of the problem and urged a growing AFR emphasis in this area. It suggested in a message to the AFR missions the initiation of local fuelwood surveys as a means of designing government sponsored and village-initiated fuelwood projects.

The Bureau's concerns on Africa's fuelwood problem were replicated by the October 1978 report of the CILSS/Club du Sahel, "Energy in the Development Strategy of the Sahel". It pointed to the dominant position of fuelwood as a source of energy (80%-90% of total demand) and warned that the region would be largely desertified by the year 2000 if current trends persisted. The Sahel energy report, the work of the Forestry/Ecology team of the CILSS, as well as growing concern by Sahelian governments led to the initiation of a number of forestry and fuelwood projects in the Gambia, Mali, Senegal and Upper Volta.

A subsequent major potential impetus for expanding the Bureau's and other donor efforts in fuelwood and reforestation in Africa has been the designation of AID as the lead donor in this field among the informal grouping of "Cooperation for Development in Africa" (CDA) countries -- France, Belgium, the U.K., West Germany, Canada and the U.S. On the basis of agreed criteria, five African countries have been initially selected as candidates for expanded programs -- Somalia, Malawi, Senegal, Upper Volta and Burundi. Agreement has also been reached on a

process for comprehensively evaluating country requirements and resources and for coordinating donor actions at the country level. Much of the informational base for the CDA fuelwood/forestry initiative as well as its methodology can in part be traced to the results of the "Fuelwood and Renewable Energy Workshop" that the Bureau had convened in Paris in November, 1979 involving African and donor experts from over 20 countries and donor organizations.

Program Emphasis

Accordingly, as indicated in a program guidance message to the field in August, 1979 (AIDTO A-204), the Bureau has elected to "stress ways of meeting (African) energy needs in the areas of:

- cooking and heating by the rural and urban poor;
- water supply, grain grinding, irrigation, handicraft and other basic life functions."

The message supplemented the earlier ODC study by incorporating fuelwood production and conservation as a major AFR energy concern. It also laid great emphasis on a multi-disciplinary approach for assessing the economic feasibility and social acceptability of energy interventions and of rigorously evaluating results. It called for a continuing program of studies and analysis so that the Bureau could keep pace and deal more effectively with the evolving nature of Africa's energy problems. And it urged an expanded energy effort through (a) adding energy components to existing projects, (b) undertaking new projects, and (c) preparing national energy assessments.

The message explicitly downplayed attempting to deal with Africa's conventional energy problems caused by escalating oil prices. While it recognized the seriousness of the problem and its impact on the economies of the region, the Bureau emphasized fuelwood and renewable interventions because (a) they built on the Bureau's existing strengths and capacities in rural development, training and extension work, (b) they complemented and reinforced the Bureau's agricultural development efforts by addressing the environmental dimensions of declining agricultural productivity (e.g. erosion, river basin siltation, declining soil fertility) and (c) nearly all other major donors as well as private investment resources were becoming involved in providing assistance in the conventional energy area. Hence the Bureau's energy bias is based on a perception as to how it can most meaningfully and effectively apply its limited resources.

The approach is consistent with AID's "Energy Assistance Policy Paper" of January 1981 or the Administrator's energy guidance message of May 12, both of which recognize that energy programs, like other programs, should be tailored to regional and country specific circumstances and priorities. While both set forth a broad range of possible energy activities, including conventional, each also gives major attention to fuelwood and renewable energy concerns. The Administrator's emphasis on careful economic analysis of projects and replication through the private sector is particularly supportive of Bureau policy. Most

important, both messages urge a "significant" expansion in the Agency's energy-related activities.

Program Profile

As indicated in the attached table, AFR's energy programs have grown from annual obligations of $4.7 million in FY' 78 to $15.7 million in FY' 81 although they at present show a decline to $13.8 million in FY'82. The Bureau is presently financing or planning 24 renewable energy projects in 15 countries and 15 fuelwood and forestry projects in 12 countries. It is testing and/or demonstrating over 30 different renewable energy technologies in over 20 countries. See Table A for a tabulation of AFR's energy programs.

Illustrative of the Bureau's "second generation" of energy projects are the following examples:

Kenya: Expatriate and Kenyan consultants are undertaking village and urban energy surveys and a national energy assessment to develop a national energy plan aimed at reducing Kenyan dependance on imported fuels while accelerating the production and conservation of fuelwood. The project includes technical assistance to the Ministry of Energy and a fund for encouraging the development of promising, replicable technologies.

Lesotho: Here a renewable energy program has been set up within the Ministry of Rural Development to train village craftsmen in the fabrication of promising renewable energy technologies -- thatch insolation, solar grow holes, pedal-powered grain grinders, solar greenhouses. Trained craftsmen will return to the village to set up demonstration units aimed at widespread replication of appropriate applications. Attention will also be given to community-scale mini-hydro and biogas interventions.

Senegal: The Senegal fuelwood project involves the development of 3,000 hectares of rapid-growing trees in controlled areas of the Bandia Classified Forest to help meet the fuelwood and charcoal needs of the Dakar/Thies area. The project involves establishing a central nursery and the development of easily extendable fuelwood production systems. Research and evaluation will be conducted on nursery planning, clearing techniques, live fencing and agro-silvicultural systems.

AFR/S&T Relationships

In addition to its bilateral energy and fuelwood programs, AFR and its missions have access to the resources and expertise provided by the Office of Energy (S&T/SY) and the Office of Forestry, Environment and Natural Resources (S&T/FNR). AFR has made considerable use of both of these resources.

The Office of Energy

The Office of Energy's global programs for training LDC energy personnel in management and planning, in solar technologies, and in conventional

energy disciplines are being widely used by AFR missions. The S&T/EY projects that support the VITA and Peace Corps renewable energy expertise and surveys have been invaluable in meeting the needs of the Bureau's projects in Mali, Senegal and Rwanda, for coordinating woodstove development in the Sahel and for providing a variety of appropriate technology services and advice to our missions. The S&T/EY photovoltaic demonstration project, managed by NASA, has initiated or will be launching pilot efforts in Upper Volta, Kenya, Zimbabwe and several other locations. The energy planning project has made possible preliminary national energy assessments in Togo, Liberia and Malawi (the latter in conjunction with the World Bank) and has initiated a collaborative energy planning and training exercise in the Sudan. The conventional energy technical assistance project has or will provide missions access to skills outside of the Bureau's main energy concerns, as discussed above. Senegal, Botswana and Kenya, among others, have requested assistance on such matters as lignite potential, coal surveys, and oil refinery analysis.

Collaboration with S&T/FNR in Fuelwood/Forestry

Collaboration with S&T/FNR in this field has been more limited, simply because FNR's forestry budget is more restricted. Of particular value has been the forest resources project, administered through a PASA with USDA, which has permitted the stationing of a long term regional Forestry Adviser in REDSO/EA, the provision of short-term consulting services, such as that recently made available to the Mission in Somalia, and the planning of closer collaboration between AID and the Peace Corps in forestry activities.

Environment and Natural Resource Management

In addition to programs in energy, fuelwood and forestry, the Bureau has encouraged and engaged in a major expansion of its work in environmental management concerns, broadly defined. Growing attention to problems of environmental degradation in the developing countries were initiated by the Agency in the min-1970's and Regulation 16 was issued to strengthen the environmental criteria by which AID's own projects were to be evaluated. Meanwhile, perceptions of the problem in Africa had been sharpened by the Sahelian drought, by the UNEP conference on desertification and, as noted at the beginning of this paper by the pioneering work being carried out in Tanzania, Kenya, Botswana and the Sudan under the grant to Clark University. This latter activity eventually led to the initiation of a major Environmental Training and Management project, backstopped by a consortium of universities, including Clark, and managed by AFR/RA. The Bureau's own capability to help its missions and their African clientele address environmental issues has been greatly enhanced by the stationing of Environmental Advisers at both of the REDSOs and the formation of an Environmental Unit in AFR/DR. The Bureau has also begun a series of "phase I" profiles conducted earlier (see below), for use in national environmental planning. Such profiles are underway in Zaire and Upper Volta and additional ones are planned for FY'82.

However, most significant of all is the extent to which the Bureau, on the initiative of its missions and their host governments, have become engaged in a broad range of projects addressing regional or country specific problems having major environmental or resource management implications. A recent in-house review of AFR's project portfolio showed that -- not counting reforestation and fuelwood activities -- the Bureau was implementing or well along in planning some 30 projects, all dealing with environmental or natural resource issues. See Table B for a tabulation of the Bureau's natural resource programs.

Illustrative of this portfolio is (a) the two regional remote sensing centers, in Kenya and Upper Volta, which are training Africans and providing technical assistance on measuring and evaluating ecological change, (b) natural resource inventories and land use planning projects are taking place and planned in Mauritania, Senegal, Mali, and parts of Niger, Upper Volta and Botswana, (c) natural resource management and planning projects (e.g. river basin studies, dune stabilization, regional integrated development) projects in Mauritania, Kenya, the Gambia, Niger, Somalia, Cape Verde, Botswana, Rwanda and Senegal. Thus the Bureau has become heavily engaged, through its bilateral programs, with pressing environmental and resource management issues which play such a leading role among Africa's development problems.

Collaboration with S&T/FNR on Environmental Matters

As in energy and forestry, the Bureau's work has been enhanced and assisted through collaboration with S&T/FNR. Of particular benefit have been the "Phase I" environmental profiles (desk studies) carried out with FNR funding by the Library of Congress and the University of Arizona. S&T/FNR has also (a) commissioned environment manuals for the design of irrigation and small scale rural development projects, (b) made available a directory of U.S. environmental study programs for trainees from the LDCs, (c) financed a study on the legal, regulatory and institutional aspects of environmental protection (using Ghana, Malaysia and the Sudan as two case examples), (d) assisted the Regional College of African Wildlife Management in Mweka, Tanzania, and (e) circulated a newsletter for AID environmental field staff. In addition, pilot remote sensing activities made possible by FNR funding are now leading to full scale natural resource assessments in Mauritania and Senegal.

The S&T Bureau is actively continuing this support to the Africa Bureau. AFR staff are working closely with them on ongoing projects which include: (a) a study of selected ecological problems in the humid tropics which will include a section on central Africa, (b) an examination of methods for developing natural resource inventories and environmental baseline studies and (c) a study on renewable resource scarcities which will focus on Africa, east of the Rift Valley.

PIDs have been developed, reviewed and recommended for further development on additional subjects of great use to Africa. One will supply high quality short-term, short-notice environmental expertise for non-project assistance, another will provide for environmental training, a third will give a grant to the U.S. Man and the Biosphere program

(MAB) to fund small ($50,000) research projects in developing countries. A fourth project will provide one African country with assistance to build its water resources management infrastructure.

The general thrust on environmental matters of the new S&T Bureau will be to create a portfolio which will include projects that can provide short-notice, short-term environmental expertise to missions, and to have projects which will conduct research to address perceived future environmental problems. They intend to be guided by the Regional Bureaus via the new Sectoral Council for Energy and Natural Resources.

Issues

The foregoing narrative raises a number of issues which the Workshop may wish to address. The following list is suggestive and by no means complete.

1. With overall AID budgets likely to be stable, or even declining (in real terms), how can the Bureau's energy programs (including fuelwood) be increased, as advocated in AID's policy paper and the Administrator's message? How can we improve on our currently unimpressive record of adding energy components to other projects (e.g. agriculture, housing, health)?

2. What are the prospects for increasing AID-financed energy activities in FY'84 and '85 (assuming program allocations for FY'83 are by now fairly well defined)? Do missions/host governments see energy (including fuelwood) as a rising priority which should be pursued even at the expense of foregoing the initiation of other programs?

3. Is the Bureau on the right track with respect to its emphasis on fuelwood and renewables? Should more attention be paid to energy planning and energy conservation (both fuelwood and conventional) activities as recommended in the draft "Energy Initiatives for Africa" project paper? Should the Bureau continue to look to S&T/EY for meeting mission requests in other conventional energy matters and in energy training?

4. Is the Bureau paying sufficient attention to the potential role of the private sector (African and U.S.) in designing its energy programs? If not, how should we go about improving our performance in this regard?

5. Is the Bureau giving sufficient attention to the implementation of its existing energy, forestry and natural resource programs? If not, what should be done to improve and accelerate implementation?

6. What about evaluation? Are we learning from our successes and failures? How can we disseminate this information more effectively to the field?

7. How can AID/W (AFR and S&T) more effectively backstop the field in the various programs which are the subject of the Workshop? Are there specific shortcomings in (a) design, (b) approval or (c) implementation of such programs which need to be identified? Are there specific shortages in staff skills which need to be rectified?

8. Is REDSO backstopping adequate? Are there ways in which it can be improved? Has the Bureau achieved the right "mix" in the allocation of functions between AID/W and the REDSOs? Should the REDSOs exercise approval authority for energy projects proposed by missions under the "Energy Initiatives for Africa" project?

9. Is the Bureau adequately utilizing the resources of the Peace Corps (and PVOs) in the design and implementation of its energy, forestry and environmental programs? Can this role be more precisely defined in terms of the most promising organizations and the types of functions they seem best equipped to carry out?

10. Is there a role for African regional organizations in Africa's energy, forestry and environmental programs? Can this role be more precisely defined in terms of the most promising organizations and the types of functions they seem best equipped to carry out?

11. Is coordination with other donors a problem and, if so, is it an AID or an African problem? What can or should AID do to increase the effectiveness of donor coordination?

Table A
Energy Project Figures

Project Number and Title		FY '78	FY '79	FY '80	FY '81	Estimated FY '82	Presently Projected FY'83	LOP
635-0205	The Gambia Reforestation		1,181					1,181
615-0205	Kenya Renewable Energy			3,482	1,318			4,800
625-0937	Mali Village Reforestation (AIP)			495				495
682-0205	Mauritania Renewable Resources Management	250	325	275	1,278	1,000	2,000**	10,675*
683-0230	Niger Forestry and Land Use Planning			332	576		800	1,151
685-0219	Senegal Fuelwood Production Project		1,400	700	730	300		3,133
685-0259	Senegal Fuelwood Production II(shelf)							
685-0243	Senegal AFRICARE Reforestation (OPG)			126				126
685-0247	Senegal Village Woodlots			211				211
686-0235	Upper Volta Forestry Ed and Development		525	1,350	3,458			4,469
625-0937. 08	Upper Volta Village Forestry (AIP)			50				50
625-0937	Upper Volta Yatenga Agri-forestry Proposal (AIP)			56				56
SUBTOTAL		250	3,431	7,077	7,360	1,300	2,800	26,347

* Figures represent that portion of total funding estimated for fuelwood/energy.
** Figures represent a proposed amendment resulting in an extention and LOP noted.
Results of review should be known by end of 2nd quarter FY '82. Portion for energy not broken out of the proposed figures.

Table A
Energy Project Figures

Project Number and Title		FY '78	FY '79	FY '80	FY '81	Estimated FY '82	Presently Projected FY '83	LOP
633-0209	Botswana Renewable Energy Technology Project			725	1,000	1,500	500	3,725
625-0937. 03	Cape Verde Renewable Energy			500				500
632-0206	Lesotho Renewable Energy Technology		1,600					1,600
698-0407. 07	Liberia Mini-Hydro Electric Activity (IRT)	50			20			70
688-0217	Mali Renewable Energy	2,174			930	1,100	700	4,900
688-0202	Mali Operation Mil (Photovoltaic Pump)	220						220
688-0213	Mali Action Ble (PV Pump)	220						220
683-0235	Niger Solar Energy	500						500
698-0410. 22	Rwanda Renewable/ Improved Traditional Energy (AIP)		488					488
625-0937	Senegal Renewable Energy (AIP)			300				300
685-0208	Senegal Bakel Crop Production	700						700
	SUBTOTAL	3,864	2,088	1,525	1,950	2,600	1,200	13,223

Table A
Energy Project Figures

Project Number and Title		FY '78	FY '79	FY '80	FY '81	Estimated FY '82	Presently Projected FY '83	LOP
698-0407. 09	Togo Rural Solar Technology Activity			50				50
698-0410. 13	Upper Volta Solar Energy Demonstration (AIP)	80						80
655-0005	Cape Verde SAL Desalination Power				450			3,595
660-0095	Zaire Rural Hydro-Electric Development						2,000	10,000
682-0223	Mauritania Alternative Energy Development						960	4,150
685-0246	Senegal Renewable Energy II					1,000	1,000	5,000
650-0041	Sudan Village Renewable Energy				1,000	2,355	1,200	4,600
698-0410	Tanzania Dodoma Rural Energy Development (AIP)					500		500
603-0013	Djibouti Energy Initiatives				2,000	2,000		4,000
698-0424	Africa Regional Energy Initiatives for Africa							16,000
						2,000		3,000
	SUBTOTAL	80		50	3,450	7,855	5,160	50,975

Table A
Energy Project Figures

Project Number and Title		FY '78	FY '79	FY '80	FY '81	Estimated FY '82	Presently Projected FY '83	LOP
698-0410. 09	Burundi Alternative Energy-Peat (AIP)	490						490
695-0103	Burundi Alternative Energy-Peat II			2,000	2,000	1,106	2,000	8,000
650-0039	Sudan Petroleum Training			200				200
698-0410. 35	Guinea Community Forestry School Tree Nursery (AIP)				497			500
657-0005	Guinea-Bissau * Forestry Project					500		3,200
682-0220	Mauritania Environmental Restoration*				500	500		3,500
	SUBTOTAL	490		2,200	2,997	2,106	2,000	15,890
	TOTALS	4,684	5,519	10,852	15,757	13,861	11,160	106,435

* Not all funds represent energy expenditure.

Table 8
Natural Resources Projects Figures

Project Number and Title		FY '78	FY '79	FY '80	FY '81	FY '82	FY '83	LOP
655-0009	Cape Verde Watershed Management		1,000	1,457	2,057	1,765		6,210
682-0201	Mauritania Guidimaka Integrated Rural Development	800	1,096					3,696
	Amendment				1,643	1,000		2,805
682-0205	Mauritania Renewable Resources	1,000	1,300	1,100				4,678
	Amendment				1,278	1,000	2,000	5,997
686-0231	Seguenga Integrated Rural Development		1,000	1,000	1,356	1,600		4,956
625-0010	Sahel Regional Livestock and Mixed Agriculture			500				500
635-0202	The Gambia Soil and Water Management Unit		251		834	750	750	2,517
683-0226	Niger Rural Sector Human Resources Development		2,000	995	860	1,185		5,030
686-0221	Upper Volta Agricultural Human Resources Development	2,000	2,000	2,000		3,460		9,457
688-0205	Mali Land-Use Capability Inventory	2,200	669	400	1,725			4,678
	SUBTOTAL	6,000	9,316	7,452	9,783	10,760	2,750	50,524

Table 8
Natural Resources Projects Figures

Project Number and Title		FY '78	FY '79	FY '80	FY '81	FY '82	FY '83	LOP
698-0414	African Regional Remote Sensing (E.A.)		750	540	550	750	400	2,364
696-0117	Rwanda Rural Works					3,880		3,880
695-0105	Burundi, Bururi Forest						1,100	1,100
678-0420	African Regional Remote Sensing (W.A.)	700	1,000	500	235	1,000	400	2,290
683-0240	Niger Niamey Departmental Development, Phase II				5,704		3,000	13,582
683-0244	(PVO) Tapis Vert, Niger					300	350	650
683-0230	Niger Forestry and Land Use Planning				576		800	3,839
685-0233	Senegal Plan for Land Use and Development				1,000	1,000		2,000
686-0256	Upper Volta Environmental Sector Grant						1,000	25,000(est.)
621-0160	Tanzania-Village Environmental Improvement				500			500
649-0108	Somalia-Central Rangeland Development			3,366	3,680	3,600	3,050	14,944
	SUBTOTAL	700	1,700	4,406	12,245	10,530	10,100	70,149
	TOTAL							120,673

WORKSHOP REPORT

I. Preamble

Events of the past few years have created a perilous situation in Africa's energy, environment and forestry interaction. Petroleum price increases have caused balance of payment problems; drought and famine coupled with rapid population growth have caused serious environmental degradation. The result is that a number of nations now face political instability and financial and environmental collapse. To help clarify AID's role in dealing with these forces, the Assistant Administrator of the Bureau for Africa convened a workshop in Nairobi from 6 to 11 December 1981. The goals of the workshop were:

- to learn from field staff what issues seemed primary and how they should be addressed;
- to improve current information of designing and implementing projects in energy, forestry and environment;
- to present the Assistant Administrator with recommendations on how the Agency might proceed in the area of energy, forestry and the environment.

This report is a summation of the workshop's recommendations and priorities for action. A number of general principles emerged:

First, sentiment was unanimous that African energy and environment problems defy generalization. No single solution appears possible. Varieties of ecosystems, infrastructures, and resource bases require that individual policies and programs be developed for specific regions and even sub-national regions.

Second, energy issues and goals do not exist in isolation, but are part of the larger development process. Similarly the fuelwood need is part and parcel of the overall need for reforestation, resource management, and the tapping of entrepreneurial skill and financial incentives to increase wood production and manage forest resources more efficiently.

Third, participants clearly identified two key components: fossil fuel problems occuring primarily in urban areas, and the traditional fuel problems and environmental degradation occuring within both urban and rural areas.

Fourth, there are at least three components of a strategy to meet the energy problem:

- increased efficiency in the use of existing energy sources, be they commercial or traditional;
- increased production of energy, particularly in the area

of renewables and fuelwood;

- better natural resource planning and management.

Fifth, AID resources by themselves are far from adequate to solve the problem. If selectively and carefully invested they offer possibilities of providing leverage and testing ways to strengthen national institutions, improve production and use of forest and natural resources, expand the use of renewable energy technologies, conserve conventional energy resources, assist in energy analysis and policy planning and streamline procedures for AID action.

Sixth, given the nature of the energy problem, AID must think in a longer time period than it now does, both in formulating projects and in appraising project effectiveness. Whereas three to five years seems to be the accepted life cycle for planning present AID projects, a much longer period - 10 years or more - is often more appropriate to efforts in energy, forestry and the environment.

Seventh, the important issue of energy as related to agricultural and industrial production was raised, but the Workshop's already crowded agenda did not permit its discussion groups to make concrete recommendations on those issues.

Within the foregoing context, the Workshop advanced the following recommendations and priorities for action:

II. Institutional Considerations: Host Countries and AID

A. Host Countries

In virtually every country of Africa there is a recognized energy dilemma. Ministries, agencies or departments of energy have been newly created with all the incumbent problems of infancy. Further, the unique interface between energy, forestry and environment issues has placed special burdens on the new institutions to interact across sectoral and ministerial lines when action even within a new ministry is difficult.

Most African governments are just beginning to consider their energy needs, uses, resources and policies. Experienced staff, data availability, policy precedents, and planning models are, at best, scarce and at worst, nonexistent. Need exists in the short run for assistance to initiate policy planning and in the longer run to strengthen institutional capabilities to carry out independent analysis and planning of renewable and fossil fuels. Moreover, there is a need to develop plans which place energy in a broad context as well as within the overall guidelines of national development plans.

With these difficulties in mind, the Workshop recommended:

- That donors including AID, provide long and

short-term training, especially in areas of energy policy and planning, resource assessment and land use, energy technologies, energy efficiency analysis, agroforestry and natural resource management;

- That AID missions review national needs for short run assistance in policy and planning as well as longer run institutional needs.

- That planning not be confined to energy reports and assessments but that it lead to implementable project proposals.

- That policies be formulated and projects designed to take explicitly into account local institutional weaknesses by relying, wherever possible, on encouraging private sector initiatives and by placing the minimum burden on public agencies and extension services.

B. A.I.D.

To strengthen AID's ability to carry out effective energy activities, the Workshop recommended:

1. That adequate training be given to Mission officers so that they can understand and implement AID energy policy and programs.

2. That thorough evaluation be undertaken on past projects which impact on the broad fields of energy, forestry and environment and that AID/W disseminate information from these evaluations to USAIDs.

3. That help be provided to USAIDs in surveys of current and projected energy use and potential energy supply, both urban and rural, to assist in shaping sound programs.

4. That the energy implications and requirements of all projects be evaluated at the design stage.

5. That project review procedures be streamlined and a methodology established for rapid approval of projects that are of small dollar value or a proven technology.

6. That the Africa Bureau's Office of Development Resources strengthen its technical and management capacity as the principal backstop for AFR energy activities.

7. That USAIDs and AID/W organize themselves so as to

ensure the integration of agricultural, forestry and engineering capabilities to deal with the enhancement of wood supplies. Similar integration should be encouraged in the institutions of host country governments.

8. That REDSOs promising efforts at a multidisciplinary approach - which includes an initial preassessment of a country's energy problems within a total resource development context -- be encouraged.

9. That REDSO staff provide help to USAIDs in problem definition which integrates energy with forestry and resource management as well as other components in development sectors.

III. The Development and Management of Energy Resources

In considering issues and recommendations on the development and management of energy resources in Africa, the Workshop focused most attention on forestry and natural resources (including fuelwood), and on other renewable energy technologies. Issues relating to fossil fuels were considered, for the most part, in the context of energy conservation (see Section D, below).

A. Forestry and Natural Resource Management

The deterioration of the natural resource base in many African countries requires a substantial effort to improve their management and to rationalize their use by strategies specific to the needs of local populations.

Programs should include improved management of existing forest resources as well as agroforestry, afforestation and reforestation programs in urban and rural areas to increase the supply of both fuelwood and other forest products.

The gravity of the wood crisis urgently requires greater attention and concern by donors and African governments alike. There is an acute need on the part of African decision makers to become more aware of the problems of continued overgrazing, deforestation, soil erosion and environmental degradation, and to increase the capacity of African institutions to deal with them.

The long duration of forest development programs requires strategies to rationally manage and exploit existing forest resources. Concurrently, the identification and use of transitional energy resources -- such as "bridging fuels" that would serve as wood and charcoal substitutes -- and technologies that may buy time for the regeneration of these forest reserves, especially in Africa's semi-arid areas is needed. In addition, the growing numbers of urban woodfuel

and charcoal consumers requires that more attention be given to urban as well as rural fuel problems.

In particular the critical role of agroforestry should be stressed in areas where small farmers could begin to integrate agriculture with tree cultivation. Such initiatives could increase both the market possibilities of forest products and agricultural production while encouraging sound environmental practices. To facilitate the rapid adoption of agroforestry, the group recommends the following priorities for action:

1. That private establishments be encouraged to reproduce and distribute bush and tree seeds.

2. That action be taken to strengthen capabilities for rapid dissemination of information about seed sources and development of an African based "improved-tree" seed dissemination network.

3. That research and development be undertaken (1) to assess the relative importance of seed, seedlings and cuttings in forestry practice; (2) to assess alternative to monoculture, with particular attention to economic and social évaluation of agroforestry systems; (3) to assess appropriate technologies for forest management; (4) to assess the economic incentives to increase the production of forest products under a variety of land tenure pattern; (5) to identify and genetically improve promising fast growing exotic and indigenous tree species for fuelwood and other forest products.

4. That training of both agriculturalists, foresters, and other natural resource managers at all levels of their respective professional hierarchies, address the issues and problems of integrated land use management;

5. That AID encourage the development of small private nurseries in Africa. The efficient provision of seed, seedlings and cuttings for species which have already been proven could greatly help the process toward a positive transformation of the rural areas.

6. That AID include forestry and natural resource conservation considerations in future agricultural and river basin project designs and evaluations.

B. Renewable Energies

Given the rising costs of energy, attention has been focused over the last decade on renewable energies that would substantially reduce the recurrent costs of development projects. Although many technologies have been developed,

there has been little real progress to this end. The Workshop also noted that while the Bureau has been testing and demonstrating a wide range of technologies in many countries, very few of them appeared to be capable of widespread replication due to technical problems and excessive cost in relation to benefits, social acceptability, or to maintenance and repair problems which appear to be beyond the capacity of African institutions and entrepreneurs. In reviewing the role of renewable technologies, the Workshop participants felt that priority should be given to the following actions:

1. That the Africa Bureau's renewable energy technology programs be focused on the identification, introduction and dissemination of a limited number of proven technologies which hold the greatest commercial promise.*

2. That attention be paid to renewable technologies that will substantially increase agricultural output.

3. That the Bureau devote greater attention to the possibilities of mini-hydro power where such power would provide an alternative to diesel power and would be financially viable.

IV. Energy Conservation

A. Traditional Energy Conservation

Although there is considerable deforestation and consequent environmental degradation of the African landscape, this process is not only caused by the use of fuelwood by the rural population but also by overgrazing, demands for additional agricultural land and urban charcoal consumption. The continuous expansion of agriculture can be sustained only if a widespread application of agroforestry practice occurs. It is, however, possible to reduce consumption of charcoal by inbtroducing more efficient technologies. The Workshop therefore recommends the following technical assistance priorities:

1. That attention be focused on improved clay mound charcoal conversion in rural areas.

2. That manufacturing of improved wood and charcoal stoves in the urban and rural areas be rapidly undertaken as an entrepreneurial activity as a means

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* Although this was the predominant opinion of the Workshop, the view was also expressed that the Bureau should continue to support research and development of a broad range of renewable energy technologies.

to the threefold purpose of (1) benefiting the urban poor, (2) relieving the pressure of the rural environment and (3) serving as a focal point for demonstration effects throughout the country:

3. Other energy conservation technologies that hold promise of widespread dissemination within the urban and rural private sectors.

C. Increasing Conventional Energy Efficiency

Recent developments in increasing energy efficiency in the United States may be readily transferred to developing countries. While the Workshop did not have the time to give this topic sufficient consideration it recommends that this as an area in which AID may wish to be given additional emphasis.

Given the size of USAID energy budget in Africa, any intervention in the commercial sector must be strategically located. To this end, the Workshop suggested that technical assistance be considered for the following areas:

1. Conservation possibilities in the transport sector, especially in intra-urban transport;

2. Attention should be given to energy efficient building practices and, if possible strengthening of the local building codes;

3. Conservation in industry and public buildings be examined and fostered.

Some participants also noted that U.S. overseas missions were sometimes among the worst offenders of energy efficiency; rather they should serve as efficiency models and be demonstrations of what can be done.

V. Energy Initiatives for Africa Project Paper

The general consensus of the Workshop is that the Energy Initiatives for Africa Project can provide important and much needed support for the Africa Bureau's energy activities and should be redesigned to be responsive to the Workshop's recommendations. During the project's review it was recommended that more of the sub projects be identified prior to completion of the Project Paper and the administrative responsibilities of the AID Washington and field offices be clearly stated. Field offices will review the proposed project and telegram AID/W their views by Januray 31, 1982. Upon the resolution of the above, the Project Paper should be approved.

VI. Other Points of Note

In the general discussions during the conference, several points

were noted that participants felt were worthy of further attention. In particular, it was felt:

- That a follow-on meeting be held in approximately 12 months which would include AFR natural resources personnel and agricultural personnel. The Workshop would stress the agriculture-forestry interface as a means to address deforestation and environmental degradation problems.

- That more attention should be paid to the energy problems of the urban and periurban poor.

- That greater attention should be paid to sharing experience both within and between regions in Africa.

- That greater contact and exchange of information be sought with other bilateral and multilateral donor organizations.

- That a long-term strategy be established with the Peace Corps to facilitate local operations.

- That, as Washington always insists that advice from the field is the foundation upon which AID programs are built, these recommendations be seriously considered, as they represent the collective wisdom of the energy and environmental field personnel of the Bureau for Africa.

STRATEGY FOR ACTION

I. Introduction

Events of the past few years have created a perilous situation in Africa's energy, environment and forestry interaction. Petroleum price increases have caused balance of payment problems; drought and famine coupled with rapid population growth have caused serious environmental degradation. The result is that a number of nations now face political instability and financial and environmental collapse.

AID's role in dealing with these forces should be based on certain general principles:

First, African energy and environment problems defy generalization. No single solution appears practical. Varieties of ecosystems, infrastructures, and resource bases require that individual policies and programs be developed for specific regions and even sub-national regions.

Second, energy issues and goals do not exist in isolation, but are part of the larger development process. Similarly the fuelwood need is part and parcel of the overall need for reforestation resource management, and the tapping of entrepreneurial skill and financial incentives to increase wood production and to manage forest resources more efficiently.

Third, energy problems consist of two key components: fossil fuel problems which occur primarily in urban areas and make a direct impact on the modern sector; and the traditional fuel problems and environmental degradation occuring within both urban and rural areas. More attention should be given to the energy problems of the urban and periurban poor.

Fourth, a strategy to meet the energy problem should be based on four key elements:

- increased efficiency in the use of existing energy sources for productive uses,
- increased production of energy, particularly in the area of fuelwood and renewables:
- better natural resource planning and management;
- encouragement of U.S. and host country private sector involvement.

Fifth, AID resources by themselves are far from adequate to solve the problems. If selectively and carefully invested they offer possibilities of providing leverage and testing ways to strengthen national institutions, improve production and conservation of

forest and natural resources, expand the use of renewable energy technologies, conserve conventional energy resources, assist in energy analysis and policy planning and streamline procedures for AID action.

Sixth, given the nature of energy problems, AID must think in a longer time period than we now do, both in formulating projects and in appraising project effectiveness. Whereas three to five years seems now to be the accepted life cycle for planning and executing AID projects, a much longer period - 10 years or more - may be more appropriate to efforts in energy, forestry and the environment.

Seventh, energy as related to agricultural and industrial production is an important issue which the Agency ought to investigate.

II. Strategy

Within the foregoing context, AID's strategy for the development and management of energy resources should consist of action in the following areas:

A. Forestry and Natural Resource Management

African countries must improve their management and rationalize their natural resource use by strategies specific to the needs of local populations. Programs should include improved management of existing forest resources as well as agroforestry, afforestation and reforestation programs in urban and rural areas to increase the supply of both fuelwood and other forest products.

The long duration of forest development programs requires strategies to manage and rationally exploit existing forest resources. Concurrently, it requires the identification and use of transitional energy resources -- such as "bridging fuels" that would serve as wood and charcoal substitutes -- and technologies that may buy time for the regeneration of these forest reserves, especially in Africa's semi-arid areas. In addition, the growing numbers of urban woodfuel and charcoal consumers requires that more attention be given to urban as well as rural fuel problems.

In particular the critical role of agroforestry should be stressed in areas where small farmers could begin to integrate agriculture with tree cultivation. Such initiatives could increase both the market possibilities of forest products and agricultural production while encouraging sound environmental practices. To facilitate the rapid adoption of agroforestry, the following priorities for action are recommended:

1. That an assessment of the capabilities and status of forestry research in Africa be undertaken. Specific areas identified to reorient forestry research and

development include:

- an investigation of alternatives to monoculture, with particulture attention to economic and social evaluation of agroforestry systems;

- empirical analysis of appropriate technologies for forest management;

- an investigation of economic incentives to increase the production of forest products under a variety of land tenure patterns;

- enhancing efforts to identify and genetically improve promising fast growing exotic and indigenous tree species for fuelwood and other forest products.

2. That action be taken to strengthen capabilities for rapid dissemination of information about seed sources and development of an African based "improved-tree" dissemination network.

3. That training of both agriculturalists, foresters, and other natural resource managers at all levels of their respective professional hierarchies, address the issues and problems of integrated land use management.

4. That AID encourage the development of small private nurseries in Africa.

5. That AID include forestry and natural resource conservation considerations in future agricultural and river basin project designs and evaluations.

B. Renewable Energies

Given the rising costs of energy, attention has been focused over the last decade on renewable energies that would substantially reduce the recurrent cost of development projects. Although many technologies have been developed, there has been little real progress to this end. While AID has been testing and demonstrating a wide range of technologies in many countries, very few of them appear to be capable of widespread replication due to technical problems, excessive costs in relation to benefits, social acceptability, or to maintenance and repair problems which appear to be beyond the capacity of African institutions and entrepreneurs. In reviewing the role of renewable technologies, priority should be given to the following actions:

1. That the Africa Bureau's renewable energy technology programs be focused primarily on the identification, introduction and dissemination of a limited number of proven technologies which hold the greatest commercial promise and the potential for contributing significantly to total national energy supplies.

2. That attention be paid to renewable technologies that will substantially increase agricultural production.

3. That the Bureau devote greater attention to the possibilities of mini-hydro power where such power would provide a financial viable alternative to diesel power.

C. Energy Efficiency and Conservation

Although there is considerable deforestation and consequent environmental degradation of the African landscape, this process is not only caused by the use of fuelwood by the rural population but also by overgrazing, demands for additional agricultural land and urban charcoal consumption. The continuous expansion of agriculture can be sustained only if a widespread application of agroforestry practice occurs. It is, however, possible to reduce consumption of charcoal by introducing more efficient technologies. The following technical assistance priorities are therefore recommended:

1. That attention be focused on improved clay mound charcoal conversion in rural areas.

2. That manufacturing of improved wood and charcoal stoves for the urban and rural areas be rapidly undertaken as an entrepreneurial activity as a means to the three fold purpose of (1) benefiting the urban poor, (2) relieving the pressure on the rural environment and (3) serving as a focal point for demonstration effects throughout the country;

3. Other energy conservation technologies that hold promise of widespread dissemination within the urban and rural private sectors.

D. Conventional Energy

Fossil fuels and other conventional energy resources continue to make a crucial contribution to the economic development of many African countries.

AID should give additional emphasis to conventional energy development particularly where sources exist in significant quantities. Given the size of AID's energy budget in Africa,

any intervention in the commercial sector must be strategically selected. AID can assist countries in the development and efficient utilization of their conventional energy potential by providing technical assistance and training in areas such as:

- policy and planning for conventional energy use;
- improving conservation and efficiency in the transportation, building and industrial production sectors;
- fuel substitution to conserve scarce domestic and imported fuels.
- programs for assisting fossil fuel development

E. Institution Building in Host Countries and A.I.D.

1. Host Countries

In virtually every country of Africa there is a recognized energy dilemma. Ministries, agencies or departments of energy have been newly created with all the incumbent problems of infancy. Further, the unique interface between energy, forestry and environment issues has placed special burdens on the new institutions to interact across sectoral and ministerial lines when action even within a new ministry is difficult.

Most African governments are just beginning to consider their energy needs, uses, resources and policies. Experienced staff, data availability, policy precedents, and planning models are, at best, scarce and at worst, nonexistent. Need exists in the short run for assistance to initiate policy planning and in the longer run to strengthen institutional capabilities to carry out independent analysis and planning of renewable and fossil fuels. Moreover, there is a need to develop plans which place energy in a broad context as well as within the overall guidelines of national development.

With these difficulties in mind, it is recommended:

- That donors including AID provide long- and short-term training, especially in areas of energy policy and planning, resource assessment and land use, energy technologies, energy efficient analysis, agroforestry and natural resource management;
- That AID missions review national needs for short run assistance in policy and planning as well as longer run institutional needs.

- That planning not be confined to energy reports and assessment but that it lead to implementable project proposals.

- That policies be formulated and projects designed to take explicitly into account local institutional weaknesses by relying, wherever possible, on encouraging private sector initiatives and by placing the minimum burden on public agencies and extension services.

2. A.I.D.

To strengthen AID's ability to carry out effective energy activities, it is recommended:

- That adequate training be given to Mission officers so that they can understand and implement AID energy policy and programs.

- That a thorough evaluation be undertaken of past projects which impact on the broad fields of energy, forestry and environment, and that AID/W disseminate information from these evaluations to USAIDs.

- That help be provided to USAIDs in surveys of current and projected energy use and potential energy supply, both urban and rural, to assist in shaping sound programs.

- That the energy implications and requirements of all projects be evaluated at the design stage.

RECOMMENDATIONS

The approach set forth in the previous section includes a series of suggestions and recommendations for guiding our future work in energy, forestry and the environment. Certain actions should be initiated in the near term to implement the strategy. We should evaluate our experience to date so as to target our future efforts in ways most likely to have maximum impact. We should place increased emphasis on better planning - so as to help LDCs better identify the problems to be solved and the programs required to do so.

We should strengthen our training programs (for Africans and for AID staff) because no projects can succeed without competent people to design and execute them.

Action should be taken now on the following fronts:

1. Evaluation: We need to examine our experience to date in renewable energy and fuelwood to improve program performance, sharpen our approach and select the most promising technologies that hold potential for widespread replication and maximum development impact.

   A working group should be convened -- composed of AFR energy officers, counterparts from the other regional and central bureaus and evaluation officers from AFR and PPC -- to examine the issues raised in the Workshop report and design an evaluation plan for assessing energy efforts in Africa including utilization of the Energy Initiatives for Africa project.

2. Planning: Workshop discussions stressed the importance of helping African governments evaluate their total energy, forestry and environmental situations to identify policy issues, institutional problems and measures for dealing with them, including encouraging a vigorous role by the private sector.

   Good projects require planning and planning requires data. In many countries, both planning and data are often weak. Country Environmental Profile studies are now getting underway in several countries. We can build on this process by expanding the studies to include a greater emphasis on the energy and forestry components to provide a more systematic basis for integrated resource planning and project identification. The Energy Initiatives for Africa(EIA) project now being designed in all likelihood will be providing substantial resources for this kind of energy planning and project development.

   Beyond the approach outlined above, we need to help host governments and the private sector strengthen their capacity to plan for the best use of their energy and forestry resources. The Workshop agreed that "one time" assessments were not sufficient. These should be complemented by technical assistance and other

efforts to help identify potential projects, mobilize indigenous private sector involvement in energy, and lead to the implementation of energy policy recommendations by both the public and private sectors. Implicit in these discussions was the conclusion that the Bureau for Africa should include planning assistance as part of its bilateral energy activities in Africa to supplement the resourses of the Bureau for Science and Technology to respond to African requests for energy planning assistance.

Once the EIA project is approved, we should communicate with our Missions regarding planning assistance and, on the basis of their replies, develop priorities as to African candidates for such assistance. Such priorities must, of course, take into consideration energy assessments and planning assistance being provided by other donors, especially the IBRD.

3. Training of Africans: Building African capacity through training was another dominant motif of the Workshop. Energy programs cannot succeed without Africans who can run them. The Workshop recommended stepped up long- and short-term training over a broad range of subjects, building and expanding AID's existing programs and taking into account those of other donors.

   The other Regional Bureaus and the Office of Energy also recognize that the evolution of energy activities during the past few years requires a redesign of training. To this end, AFR should (a) solicit mission views on training needs and priorities for energy, forestry and natural resources management, (b) set up a working group consisting of appropriate Africa Bureau and S&T staff and an energy training consultant to do an initial assessment of current and potential training activities and institutions which are particularly relevant to training requirements in Africa, (c) cooperate in S&T efforts to redesign the Agency's centrally-funded training programs. The output of the foregoing recommendations would be a report and recommendations on how the Bureau for Africa can more effectively address African training needs, taking note of training being conducted elsewhere by AID and by other donors.

4. AID Staff Development: Improved training opportunities for AID's own staff were also urged at the Workshop. M/PM's Training Division is in the process of designing an energy training program for AID staff and AFR is participating in this work. If all goes well, a short course should be held in the fall of 1982. We endorse this initiative. In addition, we urge increased support for short- and long-term training in the planning and management of natural resources for our agriculturalists, foresters and environmental officers so as to encourage a more integrated approach to land use planning within AFR.

5. Forestry Research and Forestry Sector Support: Dominant concerns among the forestry and natural resource participants at the Workshop were:

- the present inadequacy of forestry research, especially on fast growing tree and shrub species for fuelwood and other forest products; there is a need to reorient forestry research to be more closely associated with human needs.

- the need for research on alternatives to monocultures, especially agro-forestry systems and improved management of natural vegetation.

- the chronic shortage, for a variety of reasons, of high quality genetically improved tree seeds and plant materials to supply both AID and national replanting schemes.

- the importance of encouraging private entrepreneurship for the establishment of nurseries and the distribution of seedlings.

- the need for closer integration of forestry and agriculture.

While we are seeking new knowledge, it is vital that we use the considerable body that already exists. A start in this area would be to sponsor a specialized meeting to bring together experts, interested agencies and institutions to define in greater depth the forestry research problems noted by the Workshop and to recommend options which may be pursued to address them. In preparation for this meeting, We should commission an analysis of the status and needs of forestry research in Africa to determine those lines of research receiving insufficient attention and to identify what options might be chosen to strengthen forestry research in Africa.

The terms of reference for the analysis would take into consideration the global study on forestry research priorities being sponsored by the World Bank and FAO.

WORKSHOP EVALUATION *

All of the workshop participants were asked to complete the attached evaluation sheet before leaving Nairobi. Eighteen of the 40 USAID field attendees responded and a summary of their reactions are as follows:

All, but one respondent said that the workshop was a success; many were specific about what had made it so. Their comments shared some common threads: the participants felt challenged by the different approaches presented and felt that it was an inexpensive, effective way to expose new project managers to energy problems and solutions. Other participants qualified their enthusiasm by saying that the workshop was a good first step and that additional training efforts should follow. They felt that face to face contact by field personnel will help bring unity to energy strategy in Africa. Nearly all respondents complained that there was too much material and too little time. The one negative respondent felt that the agenda failed to flow and ought to have been thought out more topically.

The second question asked the participants how they would change the agenda of any subsequent workshops. The overwhelming response was that the workshop should be followed by other training workshops which would have narrower foci. Participants want to see one set of technologies dealt with at a time, i.e., forestry and agriculture, or one topic with related subtopics, such as: what are the essential preconditions for undertaking any energy project and/or a comparison of the opportunity costs of various technologies. Throughout the evaluations, participants expressed enthusiasm for small working group activities. They would like to see even more of these in follow-up workshops. A few respondents would like to see less consultant participation yet there appears to be contradicting opinions here. In response to other questions on the evaluation sheet, they said that the consultants were the most effective speakers. Other constructive suggestions from individuals were that we ought to include the politics of energy in our case studies, and that more field trips ought to have been planned with the appropriate technical presentations given on site.

The remaining three evaluation questions focused on the relative usefulness of sessions, topics and individual presentations. The respondents generally ignored the distinctions between the three separate categories, yet one can still generalize about what they found useful in the workshop. They rated the state-of-the-art presentations on specific technologies as the most highly relevant activity and Gene Ellis' "Energy Trade-offs in Africa" as the best single presentation. There was enthusiastic praise for many of the speakers. The participants appeared reluctant to single out parts of the program which they felt were irrelevant. Thirty percent wrote nothing at all in response to that question. Others felt that the sections on the environment could have been strengthened; that too much time was spent "preaching to the converted" during the first two days; that there was unnecessary duplication in the energy assessment section; that the economic analysis was too general and that the review of Energy Initiatives for Africa was premature and out of place at the workshop.

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* Summary of the Participants' Evaluation Forms.

In all, the evaluations were favorable; their suggestions were constructive and their criticism well taken. Many participants thanked AFR/DR for the workshop on their evaluation forms and said that as a result they thought they could perform more effectively in their jobs.

APPENDICES

APPENDIX A

ENERGY ASSISTANCE POLICY PAPER *

I. Introduction

This paper sets forth AID energy assistance policy and describes, in very general terms, energy activities appropriate for AID financing. It should be read in the context of AID's overall "Strategy for a More Effective Bilateral Development Assistance Program."

Three objectives have been identified for U.S. Third World energy programs:

- to assure adequate energy supplies at reasonable prices to support continued world economic growth;
- to encourage developing countries to expand their own energy resources, both non-renewable and renewable, without increasing the risk of nuclear proliferation;
- to assist developing countries in overcoming energy-related constraints to their development.

The U.S. Government has consistently supported the expansion of energy programs for developing countries. Heads of State at the last three Economic Summits have supported and then reaffirmed a U.S.-sponsored initiative to increase assistance for such an expansion. Top Executive Branch officials have frequently stressed the importance of energy cooperation with developing countries, and the United States has strongly supported the expansion of the World Bank's energy program. The President has directed AID and ACTION/Peace Corps to give high priority to "developing integrated projects for reforestation, more efficient fuelwood use, and alternative energy sources." IDCA has identified energy as one of its sectoral priorities. And the Congress has added a number of provisions to the Foreign Assistance Act stressing the importance of energy activities for developing countries.

II. The Third World Energy Problem

Third World energy problems stem from depletion of traditional

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Agency for International Development, January 1981.

fuels, on the one hand, and a lack of developed conventional sources and inability to pay for imported fuels, on the other. Too frequently energy in Thirld World countries is equated with commercial (often imported) energy: oil for transport fuel and heating; kerosene for cooking and lighting; and oil, gas, coal, and hydropower for electricity generation. Yet energy also includes traditional fuels: fuelwood, charcoal, dung, and crop residues. Traditional fuels, particularly in rural areas, supply the major share of total energy in most AID-recipient countries and 80-90 percent of the energy used in some of the poorest countries.

While traditional and commercial energy problems are separately identifiable, there is also considerable interdependence between them. The demand for fuelwood in the cities is a major cause of pressure on many traditional fuel supplies in rural areas. Kerosene and natural gas for cooking, if widely available at affordable cost, could ease the demand for traditional fuels, yet their cost rises with the price of oil. Diesel oil for transport fuel is an essential cog in the transportation systems that support rural development. The energy implications of alternative development strategies and policies, affecting prices, production, conservation, and technology related to both traditional and commercial energy, carry important consequences for the incomes and well-being of the poor.

A. Traditional Renewable Fuels

As they have been for centuries, wood and charcoal fuels are today the main source of energy for household uses (cooking and heating) in developing countries. The World Bank estimates that in rural areas of Latin America, the Middle East, Asia, and Africa, only 12 percent of the population relies on commercial energy for cooking. Kerosene and natural gas are widely used in countries with a sizable middle class, where these fuels are subsidized or where charcoal and fuelwood are inadequate. Even in urban areas, the majority of the poor depend on traditional fuels for cooking and heating.

Deforestation is occurring rapidly in many countries, because of the increasing population's search for new agricultural land and domestic energy sources. Developing countries face a projected loss of 40 percent of their forest resources between 1978 and 2000. Whereas 10-15 kilometers is the most anyone can regularly walk to collect fuelwood, there is today virtually no wood within 70 kilometers of Niamey, Niger or Ouagadougou, Upper Volta. At the current deforestation rate, physically accessible forests would disappear altogether by 2020.

Even assuming both significant savings from more efficient stoves and considerable substitution of new sources of energy for fuelwood, recent World Bank analysis indicates that forestation activities must be increased worldwide by a factor of five -- and in Africa by a factor of fifteen -- in order to

meet projected demand. The sooner the problem is attacked, the lower the cost of effective action through balanced production and use rather than wholesale reforestation.

Rapidly escalating fossil fuel prices make a widespread solution through substitution by kerosene or natural gas highly improbable. Rather, the scarcity of fuelwood forces the poor to switch to the available alternatives of dung and crop residues. This switch deprives the land of top-soil and nutrients, thereby encouraging soil erosion and resulting in a decline in crop yield per unit of land. The World Bank estimates that by the year 2000 Nepal, for example, will lose an estimated one million tons of grain production directly attributable to this loss of natural fertilizer caused by the shortage of fuelwood. Thus, adequate fuelwood supply is critical for food production, as well as for energy.

B. Fossil Fuels and Hydroelectricity

Oil is the main source of commercial energy and largest single import in most developing countries. Forty-eight of the seventy-four oil-importing developing countries surveyed by the World Bank now depend on oil for 90 percent of their commercial energy requirements -- a dependency attributable to oil's flexibility as an energy source and its low cost until 1973. Transportation, industry, and modern agriculture are all dependent on oil.

Coal and natural gas have not been significant resources for most Third World countries, although many are now making efforts to exploit these resources. In some countries, hydropower is an important energy source. Few AID-assisted countries have large enough electrical grids to make nuclear power an economic proposition.

The post-1973 revolution in energy prices has created major alterations in the economic situation of the developing countries. The key effect is on the terms of trade: they must now give up more of their resources to buy a unit of imported energy than before. This poses three major issues, among others: (1) How will developing economies -- and national development plans -- adjust to higher energy prices? (2) Can enough external capital be obtained to cover balance of payments requirements? and (3) Will countries have continued access to energy supplies?

Economic adjustments to higher energy costs take time; moreover, they are politically and economically difficult and potentially disruptive to the development process. Following both the 1973 and 1979 oil price increases, developing countries borrowed heavily to finance continued levels of imports, causing a rapid increase in

their balance of payments deficits. The current account deficits of the oil-importing developing countries -- gradually reduced in 1976 and 1977 from the peak of 1975 -- again rose in 1978 to $24 billion. Deficits are now estimated to have been $43 billion in 1979 and are projected to reach $61 billion in 1980.

This borrowing by developing countries, much of it from private sources on commercial terms, has caused a dramatic rise in debt servicing requirements. Between 1973 and 1978 oil-importing developing countries' external debt rose from $68 billion to $187 billion, while their annual debt service requirements rose from $8 billion to $28 billion. Some developing countries will find it difficult to continue borrowing on the private market. Adjustments in their economies in the coming decade will be required.

The internal adjustments required by higher energy costs raise difficult policy choices. Commercial energy -- unless subsidized -- is often beyond the means of the poor. Subsidies, however, create distortions in resource allocation and generate large budget, and usually also foreign exchange, costs to the government. Developing countries are rethinking kerosene subsidies and possible alternatives. India, for example, is encouraging the production of fuelwood to substitute for kerosene, saving petroleum expenditures for higher value uses.

Access to supplies is also a concern. The 1973 embargo and the disruptions in 1979 and 1980 due to the Iran Revolution and the war between Iran and Iraq illustrated the tenuous nature of the international supply system. In 1979, for example, several countries suffered shortages; the lack of diesel fuel grounded half of Thailand's fishing fleet, halted irrigation pumping in India, and threatened Kenya's truck transport system.

On the positive side, there may be great potential for alleviating both sets of problems during the next 10 years. For example, fossil fuel exploration in the oil-importing developing countries remain low in comparison with other regions despite large sedimentary basin areas about which little is known. There is tremendous scope for increased use of hydroelectricity, since less than 10 percent of the potential has been developed. New and renewable energy technologies are also promising. Many of these are most appropriate in rural areas to meed basic needs, while others such as alcohol fuels will have a direct impact on demand for imported energy. The loss of tropical forests can be much alleviated by improved resource management and by more efficient use of fuelwood. On the energy demand side, significant gains can be made in energy

conservation and inter-fuel substitution. The World Bank estimates that up to 15 percent reductions in total LDC demand could be achieved by 1990, without sacrificing economic growth.

III. AID Energy Policy and Programs

AID has two basic policy goals in the energy area: (1) to ease the immediate energy constraints to development in developing countries, and (2) to help those countries make the difficult transition to a mix of energy sources that will sustain their economies in the future.

In achieving these goals, several things should be kept in mind. The first concerns the relationship of energy assistance activities to the Agency's bilateral development assistance strategy. The severity of the energy crisis and its impact on economic performance can be so great as to threaten the very capacity of many countries to succeed in the implementation of a development strategy of any kind. Thus, AID programs must be sensitive to the range of energy activities -- involving commercial energy as well as traditional fuels -- that affect development prospects.

More rapid development of the energy potential of these countries is impeded by a variety of technical and fianancial problems. These include:

- Lack of basic resource knowledge
- Lack of adequately trained personnel
- Lack of appropriate technology
- Lack of comprehensive energy planning and management
- Lack of sufficient financial resources

Overcoming these obstacles will require the combined efforts of donor governments, the private sector, and the governments of developing countries themselves. Not every aspect of the energy problem requires U.S. Government involvement or official financial assistance. AID development assistance for energy should complement rather than substitute for the resources available from other sources.

An additional consideration that should be kept in mind is that AID's program in energy, as in other fields, should be implemented in recognition of both resource and staffing constraints. Program concentration should be in those areas where AID's flexibility and capacity give the Agency a comparative advantage vis-a-vis multilateral development banks and other donor programs. In most development assistance programs, AID does not expect to provide capital assistance except for fuelwood and small hydropower and to a limited extent for other renewable energy activities.

With these considerations in mind, AID's energy program should:

- Support a wide range of activities, primarily technical assistance, tailored to the specific needs of countries in coping with the impact of petroleum price increases and the depletion of traditional renewable fuels, and beginning the long-term adjustment to an era of expansive energy and fossil fuel scarcity. AID expects that its programs will be giving major attention to renewable energy sources, especially fuelwood.

- Promote least-cost energy alternatives selected on the basis of life-cycle cost calculations (total cost of the technology over its useful life).

- Stress coordination with other U.S. agencies, bilateral donors, the World Bank and other multilateral assistance organizations, and the private sector.

- Reflect the importance of energy as an integral element in AID's various sector activities -- rural and urban -- in support of equitable growth.

- Emphasize those areas in which AID has special competence and experience: analysis and planning assistance, including project preparation and feasibility studies; training and institution-building; and site testing, demonstration, and evaluation of technologies.

This guidance should be implemented flexibly. In different countries or regions, local problems, AID program objectives, and contributions by others will dictate different mixes. A broader program that includes capital investments outside the areas of primary emphasis may be justified in certain cases, e.g., in major Economic Support Fund programs or in countries with a strong and demonstrable commitment to equitable development. Ultimately, AID's energy activities must depend on the particular country's situation, on AID's overall program goals in that country, and on the degree of creativity that AID staff can bring to bear.

A. AID Energy Programs

Consistent with these broad policy considerations, AID will carry out energy programs in the following areas:

1. Energy Analysis and Planning

A country's energy plans must be based on its own particular mix of resources and pattern of development. Yet most Third World countries have not yet examined their energy needs, uses, resources, and policies in a comprehensive and systematic manner.

Basic information on energy resources is essential for the expansion of indigenous energy production through informed decisions on energy supplies, needs, and technologies, as well as energy conservation. Existing data bases for effective planning often are poor, especially with respect to energy use in rural areas. Even in countries that have carried out extensive economic planning, the sharp increases in the price of energy since 1973 may necessitate a reevaluation of the energy systems that support their development plans, as well as possible adjustments in the plans themselves.

Technical assistance can play an important role in developing country energy resource analysis and planning, by supporting or contributing to comprehensive energy studies, geological and geophysical surveys for conventional fuel sources, renewable resource assessments, energy demand analyses, the formulation of national energy strategies and policies, and studies of particular energy subsectors. Technical assistance can also increase public and private sector capabilities to analyze the benefits and costs of the variety of energy activities, as well as presenting options for development strategies and investment priorities in different time frames. AID should be prepared to provide technical assistance in those areas where the United States has substantial expertise that is applicable to, or could be organized to address, Third World energy analysis and planning problems.

2. Energy Training and Institutional Development

The establishment of indigenous technical and institutional capability to address energy problems is a high priority for all Third World countries. Experience in agriculture, population, and other assistance programs has shown the value of significant efforts in training and institutional development.

Designing and pursuing viable energy strategies requires a wide range of skills at various levels, in such areas as energy planning, project management, geology, engineering, environmental analysis, economic and social science disciplines, and energy equipment operation and maintenance. The social, economic, and cultural aspects of energy programs are as important as the technical aspects. AID training programs, both centrally and regionally funded, should be capable of responding to the need for training people in renewable and conventional energy and include both academic and in-service arrangements. Particular attention should be paid to programs implemented in the Third World, as well as in the United States, and might cover arrangements between U.S. institutes, laboratories, or universities on the one

hand, and individual developing country or regional institutions on the other.

Institutions to establish, finance, manage, and operate energy programs in developing countries. Assistance is needed at the national level to assure that the institutions and trained people are in place to develop a national energy plan and coordinate its implementation. Developing countries must also have regional and local capability to give life to national plans or to implement region-specific activities. AID's programs should recognize and reinforce the role of the developing country private sector (manufacturing, credit, rural cooperatives) in supporting dissemination of proven new technologies.

3. Site Testing, Demonstration, and Evaluation of New Energy Technologies

Prospective "new" technologies from both renewable and non-renewable sources stretch across the entire spectrum of energy needs. Among others, they include solar hot water heaters, photovoltaic pumps, wind pumps and generators, bio-gas digestors, ethanol and methanol production, small scale hydropower, and utilization of coal-oil mixtures. These technologies are in different stages of development and application. Technology assessments are needed to match energy needs in developing countries with prospective technologies and to establish priorities for U.S. Government research, development, demonstration, and investment for developing country applications.

The United States is spending several billion dollars a year to develop and demonstrate energy technologies aimed at meeting our own domestic energy requirements. Most of these technologies have attractive applications in developing countries, either in their present form or with some modifications. A systematic review and analysis of U.S. research and development is required to identify and adapt these systems for potential developing country use.

Renewable technologies are cost-effective today vis-a-vis petroleum-dependent technologies for some applications in developing countries. Further, if present research and development reduces their cost while oil prices continue to rise, renewable technologies will be more cost-effective. Widespread adoption of new technologies will not occur, however, irrespective of cost comparisons, unless the technologies have been proven effective from technical and social as well as economic perspectives in actual developing country settings.

AID should support the site testing and demonstration of potentially attractive technologies that are ready for application and careful evaluation. With the strengthening of developing country capability in energy technology and a well-structured analysis of applications, developing country specialists and institutions can learn which technologies are appropriate for each individual setting and can formulate programs for their widespread utilization. AID should coordinate site testing and evaluation programs with other assistance agencies and developing countries to expand the information base on new technologies.

4. Increasing Energy Supplies

Developing countries must increase the amount and the efficiency of energy use in both commercial and traditional fuels to support their development efforts. AID has identified six forms of energy in which important progress can be made where AID can make a contribution: (1) fuelwood; (2) hydropower; (3) new renewable energy technologies, such as direct solar, wind, and biomass conversion; (4) oil and gas; (5) coal; and (6) energy efficiency improvements (which are functionally equivalent to a new source of supply). In addition, in selected countries AID may provide technical assistance in the development of geothermal or oil-shale resources.

AID will devote major attention to fuelwood production, both directly and by supporting multiple-use forest management activities that preserve and enhance forest resources. Used primarily for domestic cooking and heating, fuelwood has received considerable attention because of the high potential pay-off of fuelwood and forestry programs. Returns include (a) substitution for expensive imported kerosene (India estimates rural use at 3 liters/household/month or about 9 gallons/year), (b) reduced deforestation, with subsequent control of erosion, siltation, and flooding, and (c) continued use of organic fertilizers (dung, crop residues) to increase food production rather than as cooking and heating fuel. Considerable time and money must be devoted to designing fuelwood and forestry activities, because the economic, social, and political issues, along with the technical aspects, are critical, yet are still not very well defined, much less understood. Production possibilities include fuelwood plantations serving primarily urban areas and social forestry projects (e.g. supplying fuelwood, small timber, and minor forest products to the rural population) such as those now being implemented in India, Nepal, and Sri Lanka.

AID's emphasis here will be on experimental projects, village or family woodlots, social forestry projects, and

multiple-use forest management, where these activities are appropriate. AID will look initially to the multilateral development banks for most of the financing of large-scale fuelwood plantations, but stands prepared to provide technical assistance for these activities. In light of the importance of fuelwood and forestry to rural development and the well-being of the poor, however, AID will consider capital assistance for fuelwood and forestry activities when other sources of financing are not available.

In the field of hydropower, AID expects the multilateral development banks to finance the large capital costs of conventional schemes. In particular countries or regions AID can play an important role by conducting basic surveys and helping countries formulate comprehensive plans to develop large hydropower projects. The banks are not generally involved in the development of medium- and small-scale hydropower (up to 10 megawatts), which could provide decentralized electricity and feed into national or regional grids. With some systems already less expensive than fossil fuels in rural locations, and with escalating fuel prices making small hydropower even more competitive, AID will consider assistance for these smaller hydro projects.

AID will also rely heavily on the multilateral development banks, other assistance agencies, and the private sector to finance energy production from new renewable sources (e.g., biomass conversion, direct solar, wind) when the technologies and their applications have been proven. As already suggested, however, there will be many opportunities for AID to provide technical assistance for testing and demonstration of new technologies, training, institution-building, and planning.

In the near to medium term, fossil fuels will continue to be a critical commercial energy source for both industrialized and developing countries. In fact, if they are successful in promoting economic growth, most developing countries will need to increase their relative reliance on these fuels while they begin to search for long-term replacements. Large tracts of unexplored, or poorly explored, sedimentary basins exist throughout the Third World, and a recent World Bank study estimates that production from these countries could increase from 2.6 million barrels per day now to 5.9 million barrels or more per day by 1990.

The private sector will be a primary source of capital and expertise to exploit fossil fuels. In some developing countries, private investment has been impeded by corporate fears of expropriation or high taxation,

lack of potential for exportable surplus, and musunderstanding and mistrust between the host government and the corporation. The World Bank's "Program to Accelerate Petroleum Production in the Developing Countries" is intended to help overcome these problems, as well as to supplement private resources. AID's role in the fossil fuel area -- oil, gas, coal -- will take the form of technical assistance for training and institutional development, policy advice, and financing of some geological and geophysical studies in coordination with other assistance agencies.

Increasing energy efficiency in developing countries is an important but neglected "source" of new energy. Because present energy practices evolved in an era of cheap energy, and because little attention has been paid to the design of efficient energy systems, large returns can now be expected from effective conservation practices. AID will support programs to develop and promote improved cooking stoves, more efficient kerosene stoves and lamps, and more efficient charcoal manufacturing techniques. AID will also provide resources for programs to analyze and promote modern sector energy savings in industry, transportation, building, and electric power generation and distribution, in addition to household use.

5. Rural Electrification

In the past, AID has provided considerable assistance for rural electrification. The multilateral development banks also have been financing rural electrification projects. Future plans for assistance for rural electrification should take into account (1) the implications of national rural electrification plans for energy supply (particularly as they relate to oil imports); (2) evidence of the benefits from previous rural electrification projects (degree of encouragement of industry, increased irrigation, lessening of urban migration, improved income distribution, etc.); (3) the cost of electricity from a central grid when compared with decentralized systems, both conventional and non-conventional, over the life of the investment, assuming realistic estimates of future fossil-fuel prices; and (4) the relative benefits of rural electrification compared to foregone planning assistance, site testing, fuelwood activities, and other rural development programs.

Department of State

OUTGOING TELEGRAM

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FOR AID MISSION DIRECTORS AND AID REPRESENTATIVES

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TAGS:

SUBJECT: FY 1983 PROGRAM AND BUDGET GUIDANCE - ENERGY

1. I HAVE REVIEWED A.I.D.'S ENERGY POLICY AND HAVE COME TO A NUMBER OF CONCLUSIONS THAT I WOULD LIKE TO COMMUNICATE TO YOU FOR YOUR USE IN PREPARING YOUR ANNUAL BUDGET SUBMISSIONS. THIS MESSAGE COMPLEMENTS THE ENERGY ASSISTANCE POLICY PAPER ISSUED BY A.I.D. IN JANUARY (ADDITIONAL COPIES OF WHICH ARE BEING POUCHED TO YOU) AND REGIONAL BUREAU GUIDANCE.

2. AS YOU KNOW, THE ENERGY CRISIS FOR THE DEVELOPING WORLD HAS TWO MAJOR DIMENSIONS. FIRST, OIL-IMPORTING DEVELOPING COUNTRIES HAVE ENCOUNTERED SERIOUS PROBLEMS IN ADJUSTING TO THE PETROLEUM PRICE INCREASES THAT HAVE BEEN IMPOSED BY THE OPEC COUNTRIES IN THE YEARS SINCE 1973. IN MANY CASES, THE COST OF ENERGY HAS BECOME A FUNDAMENTAL CONSTRAINT TO THE OVERALL DEVELOPMENT PROCESS. IN THEIR EFFORTS TO COPE, COUNTRIES HAVE HAD TO REDUCE INVESTMENTS IN FUTURE ECONOMIC GROWTH, CUT BACK SOCIAL PROGRAMS OF BENEFIT TO THE POOR, AND GO MORE DEEPLY INTO DEBT. SECOND, DEMAND FOR TRADITIONAL FUELS--FUEL-WOOD, CHARCOAL, CROP RESIDUES AND ANIMAL WASTES--IS OUTSTRIPPING NATURAL REGROWTH AND REFORESTATION EFFORTS,

INTENSIFYING PROBLEMS OF DEFORESTATION, DESERTIFICATION, SOIL LOSS, AND WATERWAY SILTATION.

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3. THE ENERGY CRISIS IN MANY AID-ASSISTED COUNTRIES IS SEVERE. MANY KEY U.S. INTERESTS--IN PROMOTING EQUITABLE DEVELOPMENT, INCREASING WORLD ENERGY SUPPLIES, EASING STRAINS ON THE INTERNATIONAL FINANCIAL SYSTEM, AND DRAWING UPON THE TECHNICAL SKILLS OF THE U.S. PRIVATE SECTOR--CAN BE SERVED BY EFFORTS TO AMELIORATE THAT CRISIS THROUGH INCREASED SUPPLY AND IMPROVED ENERGY EFFICIENCY. THE AGENCY SHOULD, THEREFORE, INCREASE SIGNIFICANTLY THE TOTAL LEVEL OF FUNDING DEVOTED TO ENERGY-RELATED ACTIVITIES IN THE YEARS TO COME.

4. THE CHARACTER OF ENERGY PROBLEMS, AND MEANS AVAILABLE TO MANAGE THEM, VARY GREATLY FROM COUNTRY TO COUNTRY. ACCORDINGLY, OUR RESPONSE SHOULD BE CAREFULLY TAILORED TO

THE NEEDS OF INDIVIDUAL RECIPIENT NATIONS. IN SOME CASES WHERE ENERGY PROBLEMS ARE RELATIVELY MINOR, OR THERE IS LIMITED SCOPE FOR SIGNIFICANT IMPROVEMENTS IN THE NATION'S ENERGY BALANCE, THERE MAY BE LITTLE NEED FOR INCREASED ASSISTANCE IN THIS SECTOR. WHERE ENERGY PROBLEMS ARE SEVERE, OR THERE IS GREAT SCOPE FOR IMPROVED ENERGY SUPPLY, HOWEVER, AID SHOULD BE ACTIVELY INVOLVED.

5. SPECIFIC PROJECTS SHOULD BE BASED ON A CAREFUL EVALUATION OF THE OPPORTUNITIES AVAILABLE TO HAVE THE MOST FAR REACHING AND COST EFFECTIVE IMPACT ON ENERGY AND ENERGY-RELATED DEVELOPMENT PROBLEMS FACING INDIVIDUAL GOVERNMENTS. DEPENDING ON THE CASE, THIS MIGHT MEAN EMPHASIZING FUEL-WOOD PRODUCTION TO MEET THE DEMAND FOR COOKING AND HEATING FUELS, WORKING ON NEW ENERGY TECHNOLOGIES, IMPROVING ENERGY POLICY AND PLANNING CAPABILITY, TRAINING AND STRENGTHENING INSTITUTIONS, INCREASING THE EFFICIENCY OF ENERGY USE IN HOUSEHOLDS OR IN INDUSTRY OR TRANSPORT, IDENTIFYING OPPORTUNITIES FOR THE DEVELOPMENTOF INDIGENOUS FOSSIL FUELS, OR FINANCING PROJECT PREPARATION AND FEASIBILITY STUDIES. THE KEY VARIABLE IS THE DEGREETO WHICH ENERGY AVAILABILITY AND COST POSE A FUNDAMENTAL THREAT TO ECONOMIC DEVELOPMENT AND TO THE WELFARE OF THE POOR, AND THE DEGREE TO WHICH FOREIGN ASSISTANCE CAN BE CATALYTIC IN OVERCOMING THIS CONSTRAINT.

6. GENERALLY SPEAKING, WE SHOULD PROMOTE THE LEAST COSTLY ENERGY ALTERNATIVES AVAILABLE, AND THESE SHOULD BE

SELECTED ON THE BASIS OF LIFE-CYCLE COST CALCULATIONS. WE SHOULD ALSO CONTINUE TO STRESS TECHNICAL ASSISTANCE IN OUR PROJECTS AND SHOULD ENCOURAGE THE INVOLVEMENT OF THE PRIVATE SECTOR, BOTH U.S. AND FOREIGN. FINALLY, ENERGY ASSISTANCE SHOULD BE CONDUCTED WHEREVER POSSIBLE IN CLOSE COORDINATION WITH OTHER U.S. AGENCIES, BILATERAL DONORS, THE WORLD BANK, AND OTHER MULTILATERAL ORGANIZATIONS.

7. A COMMITMENT TO INCREASE SIGNIFICANTLY OUR ENERGY ASSISTANCE ACTIVITIES ALSO HAS IMPLICATIONS FOR AGENCY STAFFING AND CONTRACTING. WITHIN PRESCRIBED DIRECT HIRE AND PSC CEILINGS, I EXPECT AID/W AND THOSE MISSIONS THAT PLAN SUSTAINED ACTIVITY IN THIS SECTOR, WHETHER IN RENEWABLE OR IN CONVENTIONAL ENERGY, TO TAKE STEPS TO ACQUIRE PERSONNEL WITH THE SKILLS NECESSARY TO DESIGN AND MANAGE PROJECTS AND TO ANALYZE THE ECONOMIC AND

SOCIAL IMPACTS OF ALTERNATIVE ENERGY ASSISTANCE PROGRAMS. OVER THE COMING MONTHS, WE WILL BE WORKING HERE IN WASHINGTON TO INCREASE OUR CAPACITY TO PROVIDE ANY ASSISTANCE YOU MAY NEED IN OUTYEAR PLANNING FOR AN ENHANCED LEVEL OF PROJECT ACTIVITY IN ENERGY. HAIG

Position Paper

for

U.S. Delegation to UN Conference on New and Renewable Sources of Energy

Bilateral Assistance for New and Renewable Sources of Energy

Problem: To describe the U.S. policy on bilateral assistance for New and Renewable Sources of Energy.

Relative Importance to the U.S.: The U.S. is encouraging the developing countries to expand the use of their own renewable energy resources and maximize energy efficiency, thus supporting their development aspirations while expanding world energy supplies. The full utilization of new and renewable sources of energy can made an important contribution to supporting continued world economic growth, as more applications using these sources become economically viable.

U.S. Position: The U.S. position is based on AID's energy assistance policy paper and the Energy Policy Cable signed by the AID Administrator May 12, 1981, which states, inter alia, that: "The Agency should increase significantly the total level of funding devoted to energy-related activities in the years to come." The bilateral assistance program gives significant attention to new and renewable sources of energy, and accordingly expects a substantial increase in funding for these activities as the overall program expands.

Background: U.S. bilateral assistance energy programs reflect a recognition of the energy problems facing developing countries characterized by separate by related dimensions--dependence on imported oil, and inadequate fuelwood supplies to meet domestic demand. AID, the implementing Agency for U.S. assistance, is tailoring programs to individual country requirements and characteristics, consistent with each mission's program objectives and areas where AID programs can act as a catalyst to investment. These orograms will address not only renewable technologies but the use of non-renewable resources not being exploited, and the more effective and efficient use of all energy forms. In addition, as projects are developed, AID will emphasize the importance of energy as a critical factor in achieving development goals in food production, employment, and the environment. The Trade and Development Program (TDP) will provide some additional assistance

by facilitating the transfer of U.S. energy technology through grant-financing of project planning services.

Discussion: AID programs are expected to concentrate on technical assistance in the following areas:

-- analysis of needs, uses, resources and policies;
-- training and institutional development;
-- site testing, demonstration, and evaluation of new technologies;
-- increasing energy supplies, both conventional and renewable, with significant attention to fuelwood activities.

In most development assistance programs, AID does not expect to provide capital assistance except for fuelwood and small hydropower projects and to a limited extent for other renewable enrgy technologies.

The TDP program will finance pre-feasibility and feasibility studies, technology workshops and technology orientation visists to the United States.

U.S. assistance in the areas mentioned above is intended to help create the conditions for private investment in new and renewable sources of energy as these technologies become economically viable. The U.S. expects that the private sector will provide the primary financing for production of renewable energy just as the private sector does for fossil fuels in most developing countries. In areas where public investment is appropriate, multilateral sources of financing are expected to provide the major share of capital assistance.

In the conduct of its programs, the U.S. will encourage involvement of the private sector, and coordination and information exchange with other donors, the World Bank and other multilateral organizations.

As the negotiations on the UNCNRSE plan of action move forward, proposals may be tabled for increased training, energy assessment and research and development on (i) tree species and varieties and (ii) new and renewable technologies that are projected to be cost-effective within the next decade. These areas coincide with AID's program interest. The U.S. would be willing to consider initiatives for establishing bilateral and international coordination in these areas, subject to the availability of funds. In areas where AID has particular interest and capacity, AID may wish to take a lead coordinating role. The U.S. would prefer that international coordination be led by organizations such as the World Bank or FAO.

AID's energy program budget as presented to the Congress for FY 82 is as follow:

	($ Millions)		
	FY 80	FY 81	FY 82
DEVELOPMENT ASSISTANCE			
Renewables (Excluding fuelwoods)	11.9	30.2	40.0
Fuelwood	11.3	8.6	37.6
Fossil Fuels	4.7	13.7	15.6
Subtotal	27.9	52.5	93.2
Power Generation & Distribution	19.8	25.8	.3
Total Development Assistance	47.7	78.3	93.5

ECONOMIC SUPPORT FUND

In addition to AID's programs, the Trade and Development Program provides small amounts of assistance for developing countries to promote renewable energy technologies.

July 1981

APPENDIX D

PROGRAMS AND PROJECTS OF THE OFFICE OF ENERGY

I. Background

The Office of Energy (S&T/EY) is constituted of eight professionals with background in energy policy, conventional and renewable energy technologies, and energy program management. The budget for FY 1982 is $9.65 million. At present, $9.65 million is projected for FY 1983. The Office of Energy is a component of the Agency Directorate for Energy and Natural Resources. This centrally-funded program resource is available to Regional Bureaus, Missions and AID Affairs Officers.

The Office of Energy seeks to ease LDC energy constraints to development and assist them to make the difficult transition to the new mix of energy sources required to sustain their economies. Toward this end, LDCs are assisted in using available energy more efficiently while conserving it where possible, in increasing energy supplies employing both conventional and alternative indigenous resources, and in minimizing costs associated with scarce, expensive imported fuels. The Office of Energy offers the following types of assistance:

- General Technical Services. Technical reviews and evaluations; support for workshops, conference and seminars; coordination among donors and technical agencies; provision of institutional and individual expertise for design, implementation and evaluation of projects.

- Energy Planning. Assistance to LDCs in formulating national energy policies and strategies; analyzing demand by sector; selection of energy conversion technologies, provision of on-site training in survey and planning techniques.

- Energy Training and Institutional Development. Training of LDC planners, decision-makers and mid-level technical personnel; consultation on institutional development plans.

- Increasing Energy Supplies. Help LDCs to explore, develop and market indigenous oil, natural gas and coal resources through technical assistance and training; accelerate the LDC shift to non-conventional energy sources where appropriate through site-testing, demonstration and evaluation of new energy conversion technologies; conduct national resource reconnaissance surveys where indicated; promote low-cost, small-scale energy conversion technologies; expand supplies of

fuelwood and charcoal; promote more effective use of bioresources.

II. Enhancing the Private Sector Potential of Energy

Energy lends itself to the involvement of developing country and U.S. private enterprise. The Office of Energy actively seeks substantially greater private sector support for development of energy in LDCs through the following activities, among others:

- To enroll young executives of U.S. energy industries (at the expense of their corporations) in the Energy Management Training Course at Stony Brook. This will expand contacts with U.S. industry by LDC participants and provide new relationships for the U.S. private sector with LDC energy officials in decision-making positions.

- To promote U.S. photovoltaic products in Third World applications through the five-year research applications project in photovoltaic technology with the NASA/Lewis Research Center. The project is providing test data on innovative applications of photovoltaic (solar cell) arrays in LDCs which require small amounts of electricity at relatively high cost, e.g. in rural clinics, education and communication projects.

- To refer to the Trade and Development Program opportunities for the sale of U.S. technical services and products in energy.

- To supply U.S. companies and technical consulting firms with background about A.I.D. energy programs and LDC needs and interests upon request.

- To tap private sector expertise wherever possible in project design and development. For example, the Office of Energy has a major contract with Bechtel National Corporation to provide technical services in development of coal, natural gas, oil and geothermal resources in developing countries.

III. Office of Energy Programs

The following program areas are being carried out by the Office of Energy.

A. Technical Assistance

1. Energy Planning Assistance

Purpose: To enable LDC policy makers to carry out

effective long-term energy planning within the context of national economic development plans.

Resources Available: Country-level planning efforts are assisted by individuals or teams with sound LDC energy planning and research experience. Efforts focus on analyzing the feasibility of specific interventions, capital investments in developing resources programs, selection of technologies for increasing energy supplies and energy conservation. Activities may include institution-building, joint planning with assistance from teams contracted by S&T/EY or Missions, and analysis of critical policy issues such as energy pricing, incentives to implement strategies, and social economic impact assessments of proposed strategies. Assistance in developing a supporting data base can be provided. In-country and U.S. training activities can be designed to advance national energy plans.

Experience: Country-level energy planning activities have been conducted in Tunisia, Morocco, Guyana, Togo, Malawi, Sudan, Kenya, and Liberia. Energy-based economic and policy studies carried out by Resources for the Future. A workshop on energy survey methodologies was conducted by the National Academy of Sciences, funded by the Office of Energy.

Funding: FY 1981: $2.3 million; FY 1982: $1 million. Life of Project: $10 million projected for Phase II.

Contractors: Include Energy Development/International; Ferguson/Bryan; Energy and Environmental Engineering, Inc., Development Sciences, Inc., and International Science and Technology Institute.

Project Officers: Pamela L. Baldwin, Patricia Koshel

2. Energy Technical Services

Purpose: To provide short-term scientific and engineering experts in response to field and LDC requests for assistance in energy planning and program development, selection, transfer and adaptation of energy technologies, and assessment/evaluation.

Resources Available: A wide range of services is available under an Office of Energy RSSA with the Department of Energy. Technical staff from DOE and all the National Energy Laboratories [e.g. Brookhaven, Argonne, Oak Ridge, Los Alamos, Idaho, Lawrence Berkeley and the Solar Energy Research Institute (SERI)], can be made available on short notice without lengthy contract delays for assignments in LDCs. Services include technical consultation, choice of technology and

equipment, management guidance, evaluation, and applied research.

Experience: Helping Indonesia establish a national energy laboratory, the Sudan Petroleum Administration to design an energy training program, Senegal to design a solar energy water pumping project, Morocco to plan a Renewable Energy Institute at Marrakech, and the Caribbean Regional Technical Office at Barbados to consult on renewable energy projects in the ten countries it covers.

Funding: FY 1981: $400,000; FY 1982: $200,000. Reserves from previous year obligations and paybacks from Mission projects. Missions are urged to use this resource as a revolving fund, replenishing it as funds become available.

Project Officer: Shirley Toth

3. Conventional Energy Technical Assistance

Purpose: To assist developing countries identify and assess potential indigenous resources of coal, oil and natural gas.

Resources Available: High-level, experienced technical personnel to assist LDCs in exploring, extracting, producing and marketing existing or newly discovered sources of conventional energy. Production possibilities of known reserves will be evaluated on request. Where new resources are indicated, assistance can be supplied for their systematic exploration, using seismic and other geophysical survey techniques, geochemical studies and, where relevant, application of satellite and aircraft sensing imagery and photography.

Methodology: An Office of Energy specialist in conventional energy visits the developing country at Mission request to discuss requirements with indigenous officials and visit local sites and facilities. Once suggested activities are defined, a scope of work is prepared with the Mission. Existing contractor resources (Bechtel, USGS) or new contract expertise can be arranged for implementation.

Experience: CY 1981 was the initial year of conventional energy assistance. Bechtel National, Inc. the primary contractor, is assisting Sudan with recommendations to upgrade the Blue Nile Power Grid, Morocco and Ecuador in planning for use of fossil fuel resources, and Bangladesh for development of natural gas and coal resources. At the request of the Department of State, a U.S. Geological Survey research vessel is making a geophysical survey of

a number of countries in the South Pacific to identify potential off-shore petroleum resources.

Funding: FY 1981: $1.7 million; FY 1982: $2.95 million.

Project Officer: Charles Bliss

4. Bioenergy Systems and Technology

Purpose: To promote development of cost-effective bioenergy production systems with the aim of increasing fuel supplies of biological origin in LDCs. The goal is to increase effectiveness of existing bioresources and development of new resources.

Resources Available: A core group of four full-time U.S. Forest Service experts to assist LDCs with bioresource assessments and design of bioenergy production systems. The latter includes capabilities in selection of conversion technologies and cultivation systems, species improvement, and marketing techniques. The core group is supplemented by other specialists from USFS or USDA and through use of outside experts as required. Demonstration and evaluation of new biomass conversion technologies can be arranged.

Experience: Biomass prefeasibility studies have been conducted in Panama, Guyana, Morocco, Costa Rica, Indonesia and Ecuador. State-of-the-art appraisals have been produced in areas such as combustion systems for agricultural and forest residues, methane fermentation of woody biomass, ethanol from sugar crops, and heat engines fueled from biomass. A bioenergy handbook with detailed technical data and specifications has been published for missions and host countries.

Funding: FY 1981: $1 million; FY 1982: $1 million.

Project Officer: W. Paul Weatherly

5. Small Decentralized Waterpower

Purpose: To assist LDCs identify, design, construct and operate small-scale, decentralized hydroelectric power systems to help ease energy barriers to development by increasing the supply of renewable energy.

Resources Available: A full-time staff of six professionals in the National Rural Electric Cooperative Association, a group of independent U.S. utility associations with extensive experience in small waterpower and rural electrification. Assistance can be supplied in national surveys, prefeasibility and

feasibility studies: design and installation of hydropower; preparation of local demand forecasts and investment/operating cost estimates; analyses of financial, economic, sociological and environmental aspects of projects; and training for LDC planners and engineers in this field. NRECA taps expertise from its member associations of external consultants to study specific aspects of projects, e.g. civil works, hydrology, and electrical engineering including turbine and generator specifications and distribution systems. Other resources such as experienced hydraulic and electrical engineers from the Tennessee Valley Authority, are also available.

Experience: Assistance to 12 AID countries ranging as follows: preparing work scopes and project papers, country-wide hydropower surveys, prefeasibility studies, preliminary engineering, technical advisory services. In some countries NRECA engineers have recommended restoration of abandoned hydro sites at a fraction of the cost of new installations. NRECA has conducted regional workshops in Quito, Abidjan and Bangkok, involving a total of more than 150 participants from about 50 countries.

Funding: FY 1981: $1 million; FY 1982: $800,000.

Project Manager: William Eilers

B. Education and Training

1. Energy Management Training

Purpose: To develop LDC participant skills in energy planning and management, including familiarization with technical options associated with energy production and conversion and an understanding of the financial needs and institutional constraints involved in various development strategies.

Resources Available: A seven-week course offered in March and September each year at the Institute for Energy Research of the State University of New York at Stony Brook, Long Island, 60 miles east on New York City. The course is offered in conjunction with the National Center for Analysis of Energy Systems of the Brookhaven National Laboratory. Designed for middle to upper level LDC management specialists in energy planning or administrative institutions, preferably those with technical training and professional experience in an energy-related activity who have moved into energy management. The seven-week course is supplemented with a one-week field trip.

Course Curriculum:

- Rationale for Energy Planning. Importance and benefits of national energy planning. Relationship to development planning.

- Defining the current situation. Energy information, data needs, and sources, energy modeling techniques; energy assessments, sectoral energy use and measurement; energy demand forecasting; resource evaluation.

- Identification of Policy Options. Role of assessments and applying results, energy supply planning, expanding conventional and renewable resources, industrial energy conservation.

- Program and Project Evaluation. Project evaluation, analysis of economic impact models, introduction to pricing structures and policies, capital planning and budgeting under uncertainty, and application of financial investment and analysis.

Experience: Since 1978 some 200 LDC participants from energy ministries, economic planning staffs, central banks, donor agencies, public utilities and refineries from over 50 countries have attended the course.

Expenses: Tuition, housing, one-week field trip, medical insurance, and a cash allowance to cover meals, laundry and miscellaneous expenses are covered from the S&T/EY contract which funds the program. International air travel, in-transit lodging, meals and ground travel connections to and from Stony Brook and the participant's home country, or the Mission. Participants are not authorized to bring family members with them during the session.

Funding: FY 1981: $650,000; FY 1982: $0.

Project Manager: Shirley Toth

2. Training Program in Alternative Energy Technology

Purpose: To provide short-term training in non-conventional energy conversion technologies, emphasizing small-scale, renewable energy resources, with the objective of strengthening LDC institutional capabilities in this field.

Resources Available: A 15-week course for 40 participants offered twice each year at the Solar Energy and Energy Conversion Laboratory, School of Engineering,

University of Florida at Gainesville. Includes lectures, seminars, laboratory sessions, shop fabrication of equipment, a specialized research project, and about two weeks of field trips. Participants gain knowledge to design, construct and evaluate systems based on alternative energy technologies. Required: a university degree or equivalent in engineering or the physical sciences; at least two years experience in an energy-related field; English competency, and nomination from a sponsoring agency.

Course Curriculum: Topics include: an overview of global energy, resource assessments of solar, biomass, wind, hydropower, and geothermal energies; flat plate solar collectors; concentrating collectors and photovoltaic conversion; refrigeration and food preservation; fuels from biomass; energy conservation; economics and financing of alternative energy systems; and sociological implications of energy technology transfer.

Expenses: Full tuition, lab expenses, field trips, housing, weekly living allowance and miscellaneous costs are provided through the S&T/EY cooperative agreement with the University of Florida. International air travel and in-transit costs to and from Gainesville must be covered by the participant, his or her employer, host government or other sources. Estimated value: $15,000 for the 15-week session.

Funding: FY 1981: $40,000; FY 1982: $900,000 (tentative).

Project Manager: Shirley Toth

3. Conventional Energy Training

Purpose: To provide LDC personnel with the scientific knowledge and skills in engineering, planning and management required to explore, develop and administer national programs to use indigenous conventional energy resources. (Conventional energy is defined to include oil, natural gas, coal, large hydropower, shale oil, tar sands and geothermal.)

Resources Available: About 100 LDC participants each year are offered up to two years graduate education at U.S. universities of internships in U.S. research institutes of industry which are designed to provide practical engineering, management, and analytical experience in conventional energy specialties. Typical fields of study include: geology and geophysics, (coal, oil, gas, oil shale, and geothermal resources), petroleum engineering (reservoir management, refining, enhanced oil

recovery), coal mining engineering and coal use (beneficiation, liquification and gasification), electrical engineering (power production, conversion, rural electrification, distribution, load management), energy resource planning and management (economics, law and policy analysis, demand forecasting and conservation), civil engineering (hydropower, geothermal, and other conventional resources), mechanical engineering (boilers, cogeneration, and conservation), and chemistry and chemical engineering (petroleum refining, petrochemical production.) Required: university degree in an appropriate field, speak and read English, acceptable Graduate Record Examination.

Experience: The Conventional Energy Training Project is administered by the Institute for International Education, with scientific guidance from the American Society for Engineering Education and the Accreditations Board for Engineering and Technology. The first 41 participants are in training at 14 U.S. universities in fields which include petroleum engineering, geophysical engineering, chemical and electrical engineering, geology, energy technology policy studies, and mineral economics. Fourteen individuals attended a four-month petroleum management course offered by the Arthur D. Little, Inc. Management Education Institute. One attended Westinghouse Corporation's two-month course on power systems.

Expenses: Tuition, fees and related educational costs, travel within the U.S., an orientation program, some English language training if required, a living allowance, books and supplies, a thesis allowance, and health insurance for the participant are provided from S&T/EY funding to IIE. International travel is generally arranged and paid for by the candidate's government. Nominees must have guaranteed future employment in a field that will benefit from the training received.

Funding: FY 1981: $2.525 million; FY 1982: $2.5 million

Project Manager: Pamela Baldwin

C. Assistance to Rural Energy Activities

1. Low-Cost Energy Technology for the Rural Poor
Purpose: In promoting the use of small-scale, low-cost appropriate energy technology in less developed countries through volunteer technical assistance.

Resources Available: Information, technical assistance, and small grants are available through Volunteers in Technical Assistance (VITA) to develop, demonstrate and

apply rural energy technologies, with a focus on rural regions. The scope of technologies includes among others improved, low-priced wood stoves, firewood and charcoal technologies, wind-powered pumps, biogas digesters, wind power generators, etc. U.S. scientists and engineers are enlisted as volunteers to visit LDCs or supply technical advice through correspondence to LDC counterparts or village workers. Energy manuals are published, a rapid energy information network is being established, and in-country training programs are organized. The role of women in applying appropriate technology is stressed.

Experience: Progress to date. VITA has compiled a substantial amount of diverse energy material and has published a number of manuals. VITA personnel and consultants have visited over 20 missions. About 75 small grants averaging $7500 have been awarded to underwrite activities such as wind turbines, solar greenhouses, crop driers, testing of solar refrigerators and experiments with new types of energy conserving building materials.

Funding: FY 1981 $1.325; FY 1982: $.800 million.

Project Manager: Ray Roan

APPENDIX E

Goal and Strategies of S&T/FNR

1. Goal: The goal of the Office is to support the Agency's operational program by helping the developing clientele countries address their problems of forestry development and environmental and natural resource deterioration and by assisting the LDCs manage their natural resource endowment for productive use, including forest and related woodlands and grasslands and water, wildlife, watersheds, coastal zones, minerals, and other resources essential for their economic growth and well-being.

2. Strategies: The Office's major focus is on operational field programs, and it will use its resources to increase the effectiveness and efficiency of these programs. To the extent possible, it will make the specialist skills in the Office available to the Regional Bureaus and the Missions either from its direct-hire staff or from the extended human resource and institutional support put in place through its project activities and other linkages.

The project and non-project activities of the Office will be fashioned to satsify:

a. basic and continuing needs of our field Missions and their host countries.

b. innovative initiatives whose purpose will be to generate new information and new applications to advance the state-of-the-art.

An important element of the Office strategy deals with the manner in which the Office's activities are designed to make them relevant to Regional Bureau, Mission and host country needs. This is accomplished through two interbureau groups whose membership includes Regional Bureau, PPC and S&T Bureau personnel with competence in forestry, environment and natural resources. They are the Committee on Environment and Development and the Forest Resources Group. In addition, the Office routinely clears all project initiatives with appropriate offices in the S&T Bureau, such as the Offices of Agriculture, Energy, and Rural Development, to assure that redundancy is avoided and compatibility is achieved.

Each project will have its unique mode characteristics. The array that the Office will emphasize includes: technical asistance; planning assistance; linkages with internal and external organizations; information aggregation and dissemination; applied research; institution building; and training.

3. Rationale: The first priority in implementing the Office Strategy is to assure that we address the basic and continuing needs of the Missions and their clientele. As you will note from our ongoing and planned projects, we are putting in place activities that satisfy this demand. To the extent that funding permits, we then venture into innovative initiatives in order to advance the knowledge base in the various disciplines that make up forestry, environment and natural resources.

Office Portfolio

1. Legislative Mandate: AID Program investments in forestry, environment and natural resources have been growing significantly starting with the late seventies and into the eighties. In FY 1978 the Agency obligated $13 million; and its original FY 1982 request, now revised downward, amounted to $153 million reflecting an elevenfold rise since FY 1978. They were in part prompted by the 1972 United Nations Conference on the Human Environment (Stockholm, Sweden), the 1977 UN Water Conference (Mar del Plata, Argentina) and the 1977 UN Conference on Desertification (Nairobi, Kenya). The series of legislative changes in the Foreign Assistance Act of 1961 giving prominent attention to this area include: Sec. 118(1977), Sec. 102(1978), Sec. 103(1978), Sec. 118(1978), Sec. 119(1978), Sec. 119(1979) and Sec. 103(1979).

These amendments direct the Agency to improve the capability of the LDCs to protect and manage their environment and natural resources upon which depend their economic growth and well-being, especially that of the poor. Forestry and soil conservation are to receive special attention. Concern for the impact on the environment of AID's program was singled out, thus requiring environmental assessments. Attention was directed to the potential for renewable energy sources for rural areas, including research on the use of wood. Finally, the most explicit authorization was given to AID to provide bilateral assistance to deal with forest resource depletion and associated soil and water resource deterioration.

The translation of growing worldwide attention to environmental and natural resources problems and the legislative directions into internal AID program guidance was accomplished by the issuance of 3 Policy Determinations (PD): PD-57 of January 12, 1973 - Selected Aspects of Science and Technology; PD-63 of August 1, 1975 - Environmental Aspects of Development Assistance; and PD-14 of April 15, 1981 - AID Forestry Programs and Policies.

2. Establishment of the Office: In June 1980, the Assistant Administrator of the Development Support Bureau requested the views of the Agency's Senior Staff on the creation of a new Office of Forestry, Environment and Natural Resources. He argued that AID's growing investment in this area, especially in forestry, required centrally funded support which was not available at that time. The review of the predecessor Office's program (the Office of Science and Technology) during the FY 1982 ABS cycle provided the principal forum for Agency comment on the proposed reorganization. There was agreement that a centrally funded and managed portfolio and technical staff support were needed in forestry, environment and natural resources.

The new Office was formally approved on January 8, 1981 with a two division structure (Forestry and Environment and Natural Resources) and a staff of fifteen full-time, including 2 IPAs, and 5 part-time personnel. (Attachment 1 shows the presently authorized Office staff of 11 full-time personnel. The authorization for IPAs and part-time staff is yet to be resolved.)

3. Ongoing and Planned Office Projects: The Office's project activities are divided into two categories to show those projects that respond to satisfying the Missions' basic and continuing needs and providing innovative initiatives. The list is long (11 projects) and, therefore, on its face is misleading.

Of the four ongoing projects, two are terminating during the first half of this fiscal year (FY 1982). The Environment and Natural Resources: Expanded Information Base and the Forest Resources Management projects will continue.

The planned projects on the list reflect the formerly approved FY 1982 OYB at $3,250,000 and an FY 1983 current level of $3,500,000. The project sheets in Attachment 2 describe the 11 projects on the list. However, given the reduced level we have been asked to work with, a significant reprogramming of our funds will be required. We demonstrate the impact of this cut in the section on constraints.

Basic and Continuing Needs

Title: Environmental Training & Grants/Environmental Field Support (ongoing)
Implementation: Department of State
Project Manager: Molly Kux
LOP: $1,180 - 5 years (77-82)

Provides information (e.g., 45 country environmental profiles), guidance (e.g., environmental guidelines for irrigation), and training courses (e.g., watershed management) for AID-LDC personnel.

Title: Environment and Natural Resources: Expanded Information Base (ongoing)
Implementation: National Park Service
Project Manager: Molly Kux
LOP: $2,260 - 5 years (79-83)

Prepares and disseminates review papers, case studies and guidelines for development planners working in different biogeographic areas, such as the humid tropics, arid zones, grasslands and rangelands on natural resources management.

Title: Forest Resources Management (ongoing)
Implementation: Forest Service and Peace Corps
Project Manager: Dan Deely
LOP: $3,700 - 5 years (80-84)

Provides technical experts to assist LDCs on forestry and forestry-related activities and funds joint PC-AID collaboration in forestry activities.

Title: Environmental Planning and Management (planned 82)
Implementation: International Institute for Environment and Development
Project Manager: Ming Ivory
LOP: $1,850 - 4 years (82-85)

Assists LDCs to develop environmental protection and natural resources management institutions and improve legislation and administrative structures through advisory services.

Title: Natural Resources Management Training (planned 82)
Implementation: USDA or Department of State (MAB)
Project Manager: Caldwell Hahn
LOP: $1,500 - 5 years (82-86)

Provides training to LDC planners, economists, scientists and technicians through short technical and management courses on forestry, renewable natural resources and environmental protection issues.

Innovative Initiatives

Title: Remote Sensing for Agriculture (ongoing)
Implementation: USDA
Project Manager: Charles Paul
LOP: $1,400 - 4 years (79-82)

Provides technical assistance in interpreting LANDSAT satellite imagery and air photos to identify various cropping patterns. Surveys of sample fields produce a crop reporting system for LDC use.

Title: Tree Seed Production
Implementation: Industrial Council for Development (ICD)
Project Manager: Dan Deely
LOP: $220 - 1 year (82)

Examines the feasibility of providing support to private enterprise and public agencies to expand production of tree seed and plant material required for AID and LDC-sponsored reforestation and fuelwood production projects.

Title: Man and the Biosphere (MAB) II (planned 82)
Implementation: Department of State (MAB)
Project Manager: William Roseborough
LOP: $2,000 - 6 years (82-87)

Provides research grants averaging about $50,000 to U.S.-LDC investigators to address problems relevant to AID needs in marine and terrestrial environment problems.

Title: Forestry Sector Development (planned 82)
Implementation: Resources for the Future/Society of American Foresters, UNIFOR, Industrial Council for Development (ICD)
Project Manager: David Joslyn
LOP: $6,000 - 7 years (82-88)

Provides opportunities for more effective mobilization of local, national and international financial and human resources from private and public sectors to insure sustained growth of forestry sector. Main emphasis will be on forestry sector policy planning, reforestation of degraded sites, private sector involvement and creation of international forestry research network.

Title: Water Resources Assessment and Management (planned 82)
Implementation: Dames and Moore, Woodward Clyde, Spectral Data, University of Wisconsin
Project Manager: Charles Withington
LOP: $4,000 - 7 years (82-88)

Trains developing country hydrologists to better assess and manage their water endowment; prepares water resources atlases and provides other know-how to facilitate prediction of groundwater locations, such as photogeology using LANDSAT imagery and aircraft photography.

Title: Coastal Resources Management (planned 83)
Implementation: NOAA/University
Project Manager: William Roseborough
LOP: $2,500 - 5 years (83-87)

Investigates and determines major causes of environmental problems along coastal areas and uses this knowledge to influence LDC policies and programs to protect these vital areas subject to continuing degradation.

APPENDIX F

POLICY DETERMINATION 74

A.I.D. FORESTRY PROGRAMS AND POLICIES

I. The Importance of Forestry in Developing Countries

Forests, woodlands, and grasslands provide food, forage, fuel, shelter, commercial products, and income and employment opportunities. These material benefits are critical in enabling rural populations in developing countries to meet their basic needs. Forests also provide important environmental benefits to society at large. They perform protective functions by regulating waterflow and preventing flooding; influence both the quality and quantity of usable water for agriculture, industry, livestock, and human consumption; provide habitats for wildlife; preserve a vast genetic reservoir of plant and animal life; help minimize soil erosion and soil resource depletion; influence local climate and meteorological phenomena as well as stabilizing global climate; and make recreational, educational, and scientific contributions to the entire population and succeeding generations.

Current rates of deforestation threaten the continued realization of these benefits. Unsustainable levels of forest use must be replaced by those which can be sustained. Fuelwood needs and the expansion of agriculture into forest areas are currently responsible for a significant part of the forest depletion. Yet it has been estimated that, by the year 2000, at least 250 million people will be without fuelwood to meet their minimum cooking and heating needs. People will be forced to increase their use of animal dung and crop residues, thereby decreasing their crop yields and providing further impetus to extending cultivation into forested lands. Thus, the long term prospects for growth in agriculture are also significantly threatened by the continued depletion of tropical forests. An allocation of development resources that is both adequate and appropriate to address the deep-rooted causes of deforestation is needed.

II. The Need for Forestry Programs

A.I.D. fully recognizes the importance of forestry as a key component of environmental and ecological systems and the overwhelming evidence that "...the accelerating loss of forests and tree cover in developing countries undermines and offsets efforts to improve agricultural production and nutrition and otherwise to meet the basic human needs of the poor."[1] A.I.D. also recognizes that few developing countries have the requisite knowledge or the development resources to carry out the wide-ranging programs required to stabilize forest use and to increase forest benefits. A.I.D. will therefore provide assistance to developing countries for a range of forestry programs.

Among the forestry programs which currently require assistance are those which seek to:

- Ensure that the production and harvest of fuelwood and timber is carried out on a sustained yield basis.
- Integrate the production of trees and tree crops into agricultural systems, that is, encourage agro-forestry approaches.
- Direct the clearing of forest cover or conversion of forest lands to other uses in ways which are consistent with land use capability.
- Reforest, afforest, or encourage the natural regeneration of lands not currently supporting any forest cover — to help balance conversion and transformation losses that will occur as forest lands are inevitably converted to other uses.
- Restore the productivity of degraded watersheds and depleted soils.
- Develop communities' capabilities to initiate and undertake forestry and forestry-related activities in their own behalf.
- Protect forests and set aside certain ecological areas for protection of plant and animal species.

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1. Foreign Assistance Act of 1961, Section 103(b).

In designing and funding such programs, both A.I.D. and host governments will be confronted with a number of hard political and economic decisions. Immediate benefits from forestry -- for timber, fuelwood, fodder -- must be balanced against long term needs -- for soil fertility, genetic resources, watershed protection, ecological diversity, wildlife habitat, future commercial development, tourism, and recreation. Land required for agricultural expansion in the short term may also compete with the need to maintain or create adequate areas of forest cover. Further, the successful implementation of these programs will require rural populations to participate in these decisions. Households, for example, will have to choose between satisfying pressing daily needs for fuel and food in the short term and investing additional labor and resources in the nurturing of new forest growth for future returns.

This policy determination sets out A.I.D.'s position on addressing forestry concerns in the context of its overall development objectives.

III. Forestry in the Context of Equitable Growth

A.I.D. has endorsed a strategy for U.S. bilateral development assistance which endeavors to support developing countries in their efforts to satisfy, through sustained and equitable economic growth, the basic human needs of their populations. Major elements of this strategy include: (1) assisting the poor to increase their incomes -- through raising their productivity and access to productive resources as well as expanding their opportunities for productive employment, and (2) increasing the availability of and access to goods and services required to meet these basic needs.

There is evidence in many developing countries that unsustainable uses of forest resources are already having widespread adverse effects. Such effects are being felt by consumers who need fuelwood to cook their food, farmers who require assured supplies of water for their crops and protection against erosion for their fields, builders who rely on timbers to construct shelters, and workers who depend on jobs in forest-related industries for their livelihoods.

The tendency in forestry programs, as in many agricultural development efforts, has been to direct available resources to the most fertile and productive areas. It should be recognized, however that people with little social, cultural, or economic standing are often forced to subsist on the most marginal and fragile forest lands. These lands require both greater knowledge and substantial economic investments to sustain productivity. Yet those who live in them often have least access to such resources and find special difficulty in controlling the problems begun when the forest and vegetation cover is removed.

Without directed action to alter the allocation of development resources to marginal as well as more productive areas and to generate the knowledge needed to maintain deforested lands in productive use, inequities are likely to increase and to constrain significantly the prospects for sustained, equitable agricultural growth. These inequities and constraints will undoubtedly have broad ecological, social, and political ramifications.

IV. A.I.D. Forestry Policy

A.I.D. forestry policy includes the following elements:

1. A.I.D. will provide assistance in support of forestry and forestry-related activities. The assistance -- both technical and financial -- may be narrowly focussed (as in a reforestation activity in a single region in a single country) or it may be global in emphasis (as in support of a world-wide program of forest resources inventories).

2. A.I.D. recognizes that forestry activities may be an important instrument of rural income and employment generation. Forestry activities are thus to be seen as complementary to the Agency's broader rural development objectives. One implication of this is that in areas where underemployment is significant, labor-intensive approaches to forestry activities should be adopted.

3. Forestry program objectives supported by A.I.D. assistance may be broadly defined (as in supporting the intensification of permanent agriculture opportunities to prevent further encroachment on forested lands) or they may be narrowly specified (as in establishing a given number of tree nurseries to provide planting materials for community forestry).

4. A.I.D. recognizes that forests have multiple uses. For example, forestry (or agro-forestry) programs may be an appropriate approach for providing assistance to improve and restore the agricultural productivity of degraded watersheds and depleted soils.

5. In providing forestry assistance, A.I.D. will rely on normal project preparation procedures to indicate social, economic, and technical feasibility and to establish pragmatic project design. Popular participation of the prospective beneficiaries will be intrinsic to project preparation and implementation.

Community and participant needs, interests, and capacities must be recognized and understood. The roles of local institutions, particularly those that manage the allocation and use of land, should be given major weight in project design and implementation.

6. In addition to bilateral support, A.I.D. will provide forestry assistance in collaboration with other donors, the U.N. specialized agencies, other U.S. Government agencies, U.S. land grant institutions, and private voluntary organizations.

7. A.I.D. will rely on Mission identification of country needs and forestry project opportunities, on host country initiatives, and on international or regional organizations' analyses to determine relative priorities and emphases in its forestry assistance efforts.

8. The U.S. Government is prepared to provide food aid as appropriate to support forestry objectives. Such assistance may be provided where forestry activities are essential to sustaining the productive capacity of agriculture in the long term but will involve a reduction in food supplies in the short run or where food for work approaches are indicated. In the latter case, the impact on local food production incentives must be taken into account.

This policy determination clearly establishes that A.I.D. is prepared to offer support to developing countries to assist them in addressing the broad range of problems associated with deforestation. The task will require resources far beyond the capacity of A.I.D. to provide. Thus, it is essential that A.I.D.'s bilateral assistance be associated with the mobilization of community and national resources within the host country itself. The political and financial commitment of the host country to altering unsustainable forest resource use patterns must be supported by the similar commitment of the rural population if A.I.D.'s support is to be effective. Complementary assistance from other donor groups and organizations will also be important, and collaborative opportunities should be explored wherever possible.

Because of the diversity of problems, resources, awareness, and commitment among developing countries, this policy determination does not attempt to delineate precisely the types of programs which A.I.D. will support in all cases. Any one of several areas of activity may be appropriate starting points for policy implementation and program development:

- Analysis, planning, and policy formulation (including natural resource inventories and land use assessments, land capability classification, evaluation of tenure law and its application).

- Institution-building for natural resource management and conservation (including training, management systems, and establishment of service support institutions).

- Incorporation of forestry activities into agricultural and rural development programs.

- Afforestation or reforestation, and protection of natural or induced vegetation.

- Appropriate or alternative energy analysis.

- Action programs for technology transfer and exchange, including extension and community liaison.

- Development of the scientific knowledge base and applied forestry research.

It should be emphasized that A.I.D.'s program of assistance in forestry will encompass program and policy options well beyond the narrow bounds of tree planting. Programs that assist developing countries to improve their capacity for making sound forestry and related land and natural resource use decisions normally will be conducive to creating sustainable and productive land use patterns in the long term.

Further, it should be stressed that few social and economic benefits of projects in natural resource conservation, preservation, and management will be realized in the short term. Some programs in forestry can be accomplished relatively quickly (assessment of resources, use rates, and causes of deforestation), but the development of programs to meet other objectives (training, controlling use rates) will require a decade or more before success can be expected, much less achieved. This should not deter A.I.D. from undertaking such activities.

Indeed, where conditions of deforestation are most urgent, A.I.D. may wish to exercise considerable bilateral initiative in undertaking and supporting forestry-specific programs.

V. Implications of A.I.D. Forestry Policy for Assistance in Other Sectors

A.I.D.'s policy on forestry complements policy in other sectors. Indeed, strengthening the support for forestry-related activities should increase the potential for achieving objectives in other sectors in which A.I.D. provides assistance.

1. Environment and Natural Resources: A.I.D.'s Policy Determination on "Environmental Aspects of Development Assistance" (PD 63) and the procedural requirements contained in A.I.D. Regulation 16 (22 CFR, Part 216) direct the Agency to take forest values into account in the design of projects requiring A.I.D. assistnce. Better understanding and measurement of both benefits and adverse impacts should flow from increased activity in forestry programs.

2. Agriculture and Rural Development: The provision of support for the development of agro-forestry programs and other alternatives to unsustainable patterns of shifting cultivation should help to support and encourage a sustainable and sound balance between agricultural, range and livestock, and forest land use alternatives in developing countries. By developing alternative fuel supplies, fuelwood programs should benefit agriculture by increasing availability of dung and crop residues for soil enrichment. By developing forest-based income and employment opportunities, rural growth will be fostered.

3. Energy: The increased production of fuelwood supplies through the establishment of tree planations has already been adopted as an objective of A.I.D.'s energy policy. Thus, through direct production programs as well as through conservation of other energy sources (e.g., protection of watersheds above hydroelectric dams), forestry activities will play a key role in suppporting the achievement of A.I.D.'s energy objectives.

VI. Implications for A.I.D. Staffing

This policy on forestry could have significant staffing implications for A.I.D. The corollary to the development of new activities in forestry is an increase in staff having forestry and related interdisciplinary backgrounds. Many of the constraints to improved forestry management lie in the purview of agriculture, political science, economics, law, social organization, and informal education, as well as in the technology of forestry. The Agency currently has few foresters on its direct-hire roster. Mechanisms for supplementing and increasing forestry and related skills in A.I.D. need to be addressed, within the context of continuing limitations on staff resources, in order to enhance the effectiveness of A.I.D.'s forestry efforts.

Approved: _____

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