

Institut Pertanian Bogor * University of Wisconsin

GRADUATE EDUCATION PROJECT



Aid Project 497-0290

Report No. 28

FOELL

REPORT

to

INSTITUT PERTANIAN BOGOR
Bogor, Indonesia

by

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TRIP REPORT

IPB/UW Graduate Education Project

Visit to IPB January 14 - 27, 1984

1. Introduction

This report describes the essential activities of a trip undertaken by Dr. Wesley K. Foell under the auspices of the University of Wisconsin-Madison-AID Graduate School Development Project. In addition to his visit to the IPB campus, Dr. Foell also spent several days at ITB in Bandung in connection with the ongoing University of Wisconsin-Indonesian Energy Manpower and Training Project, and at the University of the Philippines in Manila, in connection with the new energy training project there.

The purpose of this report is to provide an overall view of the visit. Some aspects of the visit are described in greater detail in documentation developed during the visit and left with staff at IPB. The present report is organized according to six topical areas. In addition, Appendices A and B provide additional detail on activities during the trip. The topical areas covered in Section 2 are as follows:

- 2.1 IPB Workshop on Biomass Energy Supply and Demand
- 2.2 Planning for IPB Participation in ITB/UW "Workshop on Energy System Analysis and Planning" in Bandung, July-August 1984
- 2.3 IPB Seminar by W. K. Foell on Energy System and Policy Analysis: Methods and Past Studies
- 2.4 Review of Energy-Related IPB Curriculum

2.5 Discussions of Biomass Resource Inventory Programs and staff at:

-BIOTROP

-Ministry of Public Works

2.6 Joint meetings with Dr. Kamaruddin Abdullah and AID/Jakarta staff to discuss IPB Biomass Energy Programs

2. Activities

2.1 IPB Workshop on Biomass Energy Supply and Demand

A biomass energy workshop was held at IPB on January 24-25, 1984. The general agenda and list of participants are given in the Appendices.

The workshop had three primary goals:

1. The discussion of selected biomass energy issues for Indonesia.
2. The identification and elaboration of priority research topics.
3. The overall conceptual design for a research program at IPB in the area of biomass energy systems.

The meeting was held within the framework of a joint research program designed by IPB, ITB, and the University of Wisconsin-Madison. The discussions at the workshop were highly informative, spirited, and cooperative, in an atmosphere conducive to the development of joint research programs and cooperation in this area. IPB, with the particular input and organization by Dr. Abdullah Kamaruddin, provided the atmosphere and the ingredients for a successful and highly productive workshop.

There was general agreement at the workshop of the importance of biomass in Indonesian energy systems. Such issues as the need to better understand the factors influencing the substitution of fossil fuels for biomass, the potential stress of increasing biomass use upon the natural environment, the implications of future biomass energy conversion systems, and the potential of biomass for continuing to supply Indonesia's long-term energy needs in an environmentally and ecologically sustainable manner were clearly identified as major issues. There was also general agreement that IPB has a great opportunity to contribute to the analysis of these problems because of the current makeup of its staff and its involvement in agriculture and forestry. The broadly-based nature of biomass energy systems, reaching out to a number of disciplines including engineering, economics, environmental studies, forestry, as well as others, provides a highly interdisciplinary problem focus which was useful in catalyzing inputs from a diverse set of centers and departments at IPB.

A very impressive output of the conference was the apparent complementarity of the IPB and ITB programs in the area of energy systems and the great potential for joint work by the two institutions.

Listed on the next pages are the primary policy issues/objectives which were elaborated at the workshop. They are divided according to national, regional, and subregional focus.

Policy Issues/Objectives

I. National

- A. 1. Impacts of Kerosene Pricing on Biomass Energy use and Substitutes.
- 2. Impacts on Domestic Petroleum Use and Availability of Petroleum for Export.
- B. 1. Assessment of Biomass Energy Plantations
 - a. Possible reference studies: Sumatera; Kalimantan; Java.
 - b. Examination of institutional arrangements for implementation.
- 2. Development of Inventory/Monitoring Procedures for Forests/Non-Forests.
 - a. Measurement of environmental stress and depletion of biomass systems (forests/non-forests).

II. Regional

- A. 1. Assessment of Alternative Biomass Energy Sources/Technologies, Transportation Systems, and Pricing Policies for Java/West Java.
- 2. Sustainability of Biomass Forest/Non-Forest Systems in West Java.

III. Sub-Regional

- A. Sustainability Analysis and Policy Design for Biomass Energy (Forest/Non-Forest) Production Systems in Cimanuk or Citarum watershed areas.
- B. Assessment and Policy Analysis Competition between Perennial Crops (fuel wood sources) and Annual Crops (food) in Cimanuk Watershed; Incentives/Subsidies in Highland Reforestation Program.
- C. Impacts of Energy Availability/Price on Changing Patterns of Farming Systems Analysis of Energy Budgets in Agriculture.

Table 2.1 Major Research Areas and Potential Personnel

1. Biomass Stress
 - Rachmatsjah Abidin
 - Kamaruddin Abdullah
 - Zahrial Coto
2. Household and Kerosene Uses
 - Affendi Anwar
 - Lutfi Nasoetion
 - Gordon McGranahan
3. Energy Supply and Food Crops
 - Affendi Anwar
 - Lutfi Nasoetion
 - Gordon McGranahan
4. Energy Plantation
 - ITB-Tech.
 - Rachmatsjah Abidin
 - H. H. Sitompul
5. Inventory Monitoring
 - Kamaruddin Abdullah
 - Mulyarno (khusus system dinamic)
 - Uup Syafei
6. Energy Budget - Mulyarno
7. Overall Macro Energy
 - Affendi Anwar
 - Lutfi Nasoetion
 - Kamaruddin Abdullah
 - ITB

These issues were then each discussed in some detail and both the substance and the procedure for a research program were discussed. Figure 2.1 shows schematically the research components that were examined. Each of these developed from the statement of specific policy issues or problems, rather than in reverse order, i.e., from the perceived need to do some research. The group felt strongly that deriving a research program from well-focused and identified explicit problems would lead to sounder programatic design. Follow-up work is under way by the IPB staff to further elucidate these programs.

Table 2.1 lists the major research areas and personnel who would be involved in the initial work in that area. The list is meant to show interest in participation from those present at the worksnop and, of course, does not exclude participation by others at the respective institutions. It is important to note that this list provides key inputs from several of the most important areas in this type of research, namely, engineering, resource economics, forestry, remote sensing, and systems analysis. In addition, it provides a basis for integrating the complementary strengths of the institutions. Of course, this work would by nature have to reach out to other Indonesian institutions, e.g., the remote sensing teams at Public Works and at the Indonesian Center for Mapping.

The ability to further refine the reseach program and to begin its implementation will depend in part upon the inclusion of the program in Phase II of IPB's graduate program as well as the possible support of other institutions or donors. However, the program can be sufficiently compartmentalized so that individual components can get underway with only modest effort and resources.

In a brief follow-up on Thursday after the workshop was completed, a general discussion was held among IPB and ITB staff members about mechanisms for continuing the process established at the workshop. Later discussions with Rector Andi Hakim Nasoetion of IPB and other IPB administration reinforced the desirability of the joint IPB/ITB effort in this area.

As a concrete next step in this process, IPB staff will play a major role in the conduct of the upcoming Energy Systems and Analysis and Planning Workshop to be held at ITB in late July. The planning of this workshop is discussed in the next section.

The Graduate School and in particular, Dean Edi Guharja, and the Institute of Research, and in particular, Tonny Ungerer, provided very valuable input to the entire planning process and to the conduct of the visit.

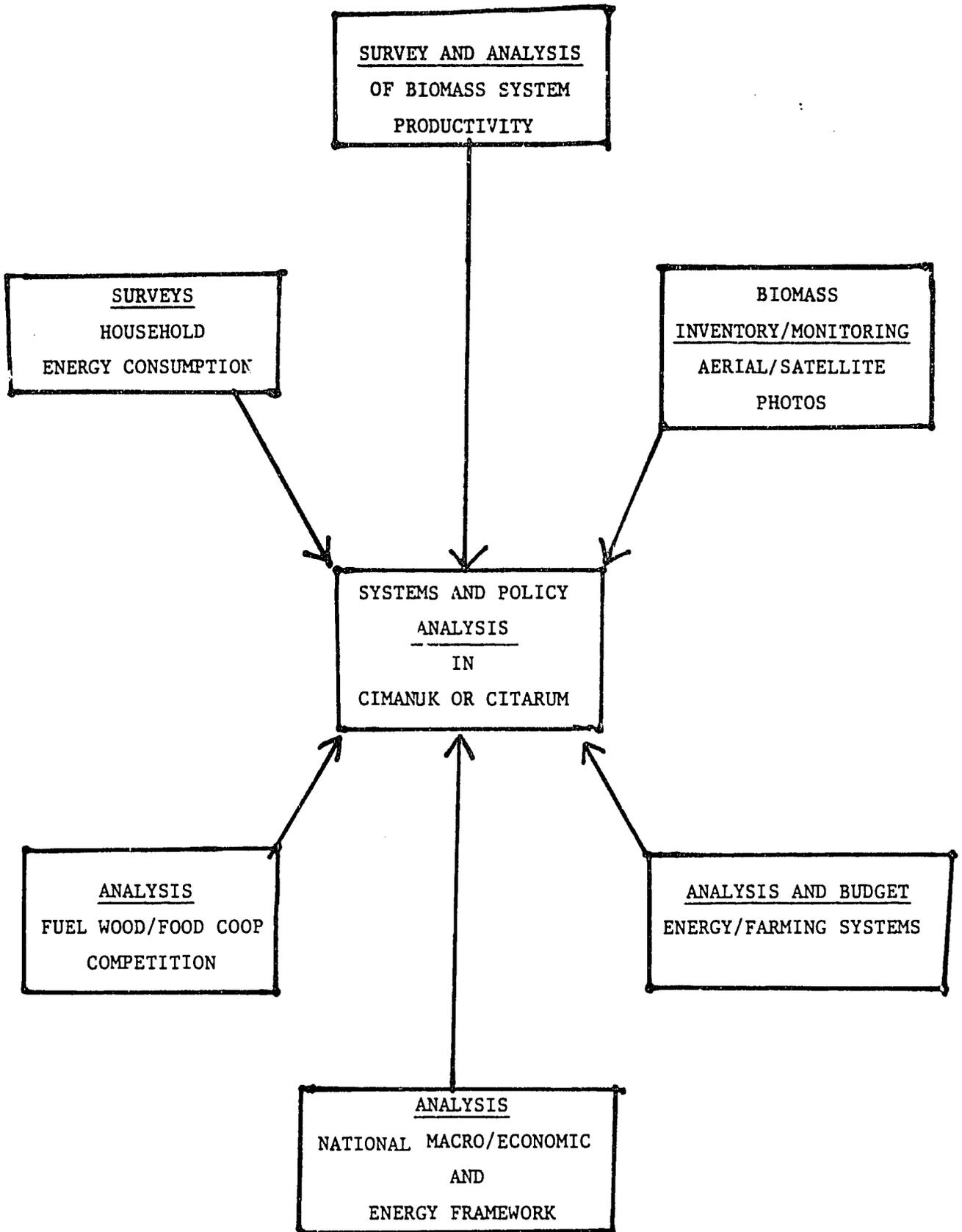


FIGURE 2.1

2.2 Planning for IPB Participation in ITB/UW "Workshop on Energy System Analysis and Planning" in Bandung, July-August, 1984.

In February and March of 1983, the University of Wisconsin held a major intensive course/workshop on energy systems analysis and planning in Indonesia. The success of this workshop, in which some 18 Indonesian energy planners, managers, and academics participated, led to a plan for a follow-up intensive course/workshop in Bandung in 1984. In the 1984 workshop, major responsibility for the conduct of the workshop would be taken by Indonesian institutions.

Following the IPB biomass energy workshop, discussions were held among staff of IPB and ITB and University of Wisconsin on possible IPB participation in this workshop. It was agreed that IPB staff would take responsibility for the major component of the intensive course/workshop dealing with biomass energy systems. In the last Madison workshop, the primary focus in the biomass area was on 1) estimations of biomass demand in the household sector, and 2) potential of charcoal production and transportation systems. Both of these areas could be expanded and improved in the upcoming workshop; in addition, the IPB group would examine the problems and potentials associated with energy plantations; would use a biomass ecosystem classification and modeling system of the sort developed by Gordon McGranahan for the purposes of studies on supply/demand balances in sub-regional studies; and would also look at the dynamics associated with alternative biomass harvesting strategies. The IPB and ITB groups agreed that they would carry out further planning of these aspects of workshop activities in the coming months.

2.3 IPB Seminar by W. K. Foell on Energy System and Policy Analysis: Methods and Past Studies.

On Saturday, January 21, 1984, Dr. Foell presented a seminar on "Energy System and Policy Analysis: Methods and Past Studies" to the faculty of IPB. The seminar, organized by Dr. Kamaruddin Abdullah, was held in the seminar room of the Department of Agricultural Engineering. The seminar was attended by approximately 25 faculty, staff, and students. The main topics of the talk were: an overview of Applied Systems Analysis, how the Energy Systems and Policy Research Program began at the UW, its current and potential applications in Indonesia, and potential areas of curriculum and research in the energy field at IPB.

The seminar seemed to be generally well-received, and the IPB faculty showed considerable interest in this field. The discussion ranged from specific questions on curriculum needs for IPB to more futuristic areas such as the long-term role of renewable energy in Indonesia and its relationship to future lifestyle and industrialization patterns.

2.4 Review of Energy-Related IPB Curriculum.

Discussions were held with Dr. Kamaruddin Abdullah and other staff, including faculty of the Department of Agricultural Engineering, on current and future course needs in the energy area. In general, it appeared that the courses taught by Dr. Kamaruddin are satisfying many of the needs of the Agricultural Engineering Department. One area which was discussed in some detail was the strengthening of the course material in

the area of energy planning and modeling. It appears that some of the analytical techniques used in the ITB/UW intensive course/workshop could appropriately be included as curriculum material.

It would be useful to consider the development of a service type course in energy for both Forestry and the Institute for Environmental Studies. Students in both of these areas may well benefit from the inclusion of more energy technology and analysis material in their curriculum, particularly as energy production and consumption increase in Indonesia in the coming years.

2.5 Discussions of Biomass Resource Inventory Programs with Staff at:

- BIOTROP
- Ministry of Public Works

A visit was made to BIOTROP, the Center for Tropical Biology supported by the Southeast Asian Ministers of Education Organization. The BIOTROP was established in 1968 for the purposes of training, research, and post-graduate study in tropical biology. Because of its activities in vegetation mapping, BIOTROP is one of the potential collaborating institutions in the planned IPB biomass energy project. Dr. Coto of BIOTROP was very cooperative in describing some of the vegetation mapping activities of the institute and in discussing potential collaboration.

With Dr. Kamaruddin, a visit was made to the Ministry of Public Works in Jakarta. Discussions were held with the Center for Data Processing and Statistics in that Ministry. The remote sensing project

in that Center was discussed in some detail with technical staff. The Center is a potential collaborator in the proposed IPB project in biomass energy.

2.6 Joint meetings with Dr. Kamaruddin Abdullah and AID/Jakarta Staff to Discuss IPB Biomass Energy Programs.

Considerable time was spent in discussions with IPB staff and AID/Jakarta staff. AID staff included Desmond O'Riordan, USAID; William Knowland, USAID/AGR/REA; and David Seckler, Senior Development Policy Advisor-Office of the Director. One result of these meetings was to increase AID's awareness of the biomass energy interests at IPB. All three of the AID staff indicated the possibility of scheduling visits to IPB in the near future to further discuss programs there.

APPENDIX A

Tentative Agenda

BIOMASS ENERGY WORKSHOP

24 January 1984

- 9:00 : Opening and Introductory
"Biomass Energy Supply and Demand"
Dr. Kamaruddin Abdullah
- 9:30 : "Workshop Procedure" (15 minutes)
Dr. W. K. Foell
- 10:00 : Session II
"Biomass Energy Potential"
Dr. Kamaruddin Abdullah
- 12:00 : Lunch
- 13:00 : Session II
"Biomass Energy Potential"
Dr. Kamaruddin Abdullah
- 15:00 : Coffee Break
- 15:30 : Session III
Dr. Kamaruddin Abdullah and Dr. Saswinadi
- Development of Agenda and Plan for Future Research
 - Discussion of IPB/UW Phase II Project
 - ITB/UW Energy Planning Workshop

Tentative Agenda
BIOMASS ENERGY WORKSHOP
25 January 1984

- 9:00 : Review of Issues
Main Topics:
Biomass Energy Supply and Demand
- 11:00 : Project Structure
DAS CITARUM
NATIONAL LEVEL
WEST JAVA
Methodology (Approaches)
Toward Solving Issues
- 13:00 : Plan of Activities
- 16:00 : Draft of Project

APPENDIX B

Names of Potential IPB Staff to be Involved with the Biomass Energy Program

Name	Field
Kamaruddin Abdullah	Agricultural Energy and Rural Electrification Forest Dynamics and Inventory-Curriculum
Moeljarno Djojmartono	System Analyst-Forest Dynamics-Energy Budget
Affendi Anwar	Resource Economics-Fuel Wood/Kerosens Issue
Lufti I. Nasoetion	Regional Planning-Curriculum Development
Rachmatsyah Abidin	Biomass Supply System
Siswadhi Soepardjo	Energy Budget-Curriculum Development
Uup Wiradisastra	Remote Sensing
Hasril Hitam	Remote Sensing
Nirwan Siregar	Agricultural Energy
Tuty Priyanto	Agricultural Energy
Endah Agustina	Agricultural Energy
Bungaran Saragih	Estate Plantation Energy
Kohar Irwanto	Agricultural Energy/Policy Analysis
