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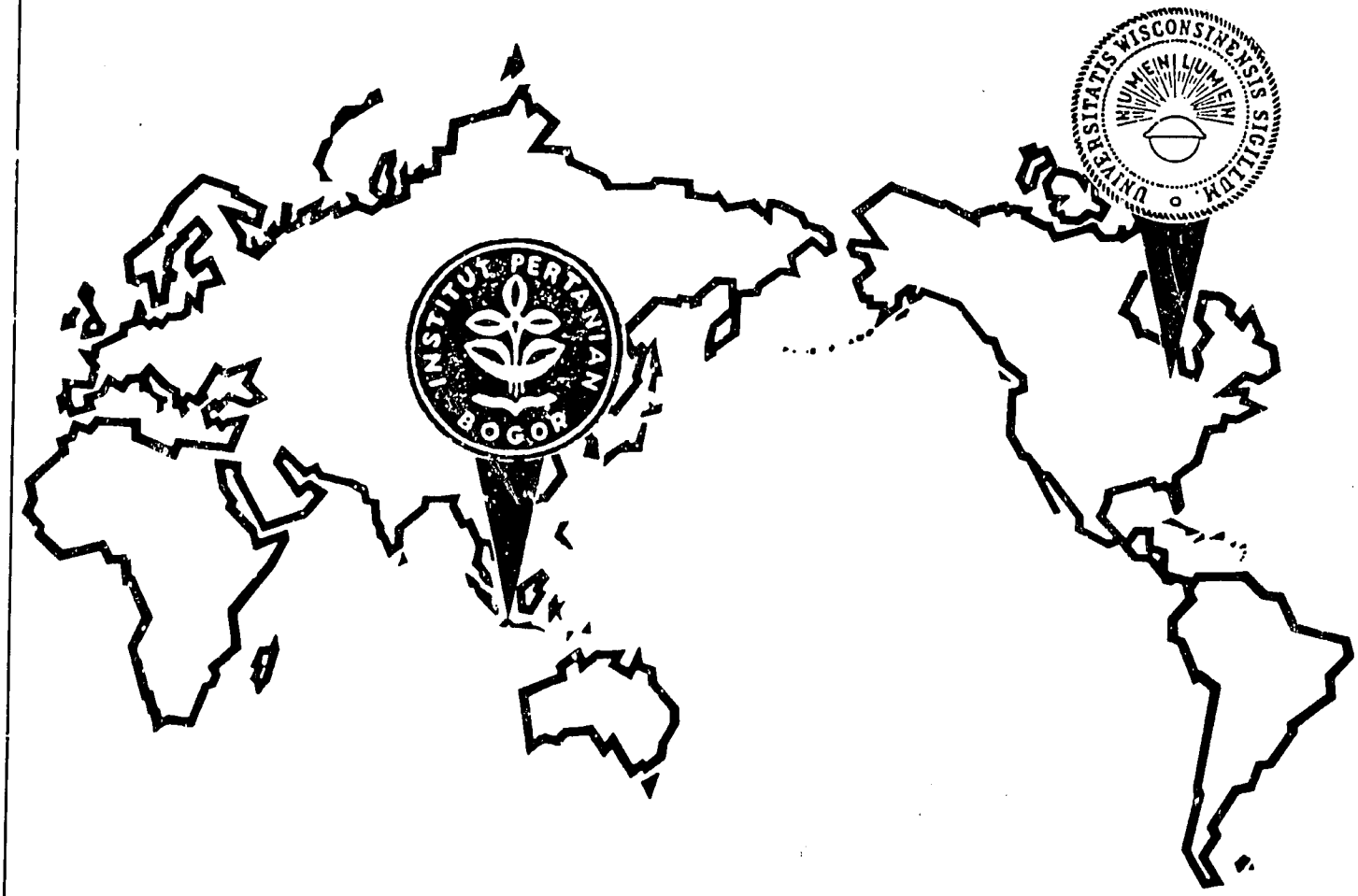

Aid Project 497-0290

Report No. 20

ADAMS & PETERSON

REPORT

ON

RECOMMENDATIONS ON THE MASTER'S DEGREE PROGRAM IN NATURAL RESOURCES AND ENVIRONMENTAL STUDIES

to

INSTITUT PERTANIAN BOGOR (IPB)
BOGOR, INDONESIA

by

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USAID PROJECT No. 497-0290

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Recommendations on the Master's degree program in natural resources and environmental studies.

Introduction: The existing master's program is four semesters constituted of 33 to 39 credit hours of work, including six credits of thesis work. The core courses require between one and two semesters of effort. At least seven options exist for specialization; in fact, the number of options is probably much greater than seven since the options can be specialized for each student. The present program can be perceived to have several problems. The program is probably too diffuse in terms of the number of options offered. The amount of time spent on the thesis is insufficient in terms of the required depth. Overall coordination of the existing program is not sufficiently broad-based. We feel that the number of credit hours in the program should be increased. Students entering the program come from a variety of backgrounds, such that the diversity of experience and previous training and education, is quite broad. Such diversity is highly desirable but at the same time creates problems in that the students entering the program do not start from a common ground with respect to prerequisites for required courses in the program. For example, students entering the program after having worked in an agency for several years might be insufficiently trained in beginning statistics, economics, or other subject areas. A very significant problem we perceive is a serious lack in English, perhaps both with respect to an ability to read fairly rapidly and to communicate effectively orally. Another problem that we have identified is in the area of course generation; we feel that adequate utilization of existing courses may be hampered by a tendency to develop new courses specific for the program. We also note that adequate communication seems to be lacking between some Departments and the present program.

Compensation for additional work done at the S_2 and S_3 level creates a difficult situation for those teaching only S_1 courses. Consideration should be given for providing such honoraria to the Department, with the

Department sharing it with the S_1, S_2, and S_3 instructors. Over a period of time, unequal compensation for teaching loads may cause more friction than any other single item.

Recommendations:

I. The master's program should be coordinated by a STEERING COMMITTEE composed of six persons. These are the Deans of the respective faculties (Faculties of Fisheries, Forestry, Agriculture, Agricultural Engineering, and Social Sciences) or their appointed representatives, plus the Director of FPS-PSL. This STEERING COMMITTEE would have overall responsibility for curriculum matters and long-term management and coordination of the program. The wide breath of the committee is designed for the purpose of ensuring adequate direction from the different areas on campus of IPB which have the strongest interests in the success of the program.

II. The number of credits required for completion of the master's degree in the program should be set at 45, for qualified students.

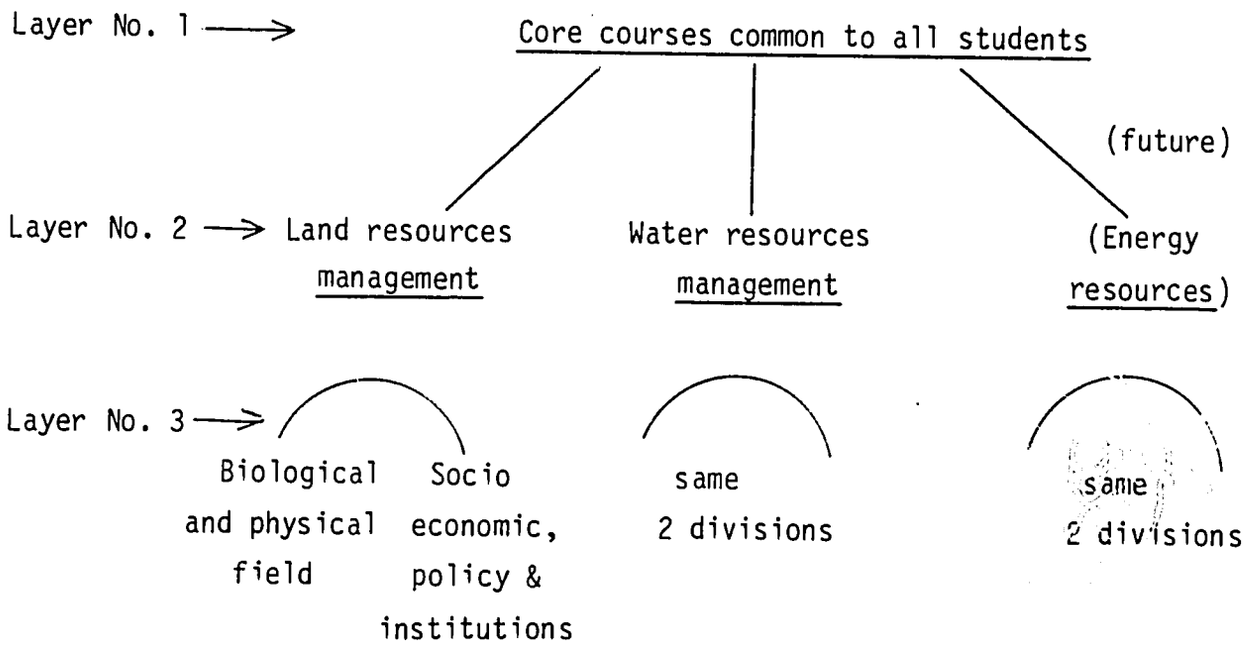
III. To be considered a qualified student, the student should have met the prerequisites for the program, to be set by the STEERING COMMITTEE. Important prerequisites will include the S_1 degree, a basic course in statistics, a basic course in economics, and adequate training in English language to meet minimum requirements as set by the STEERING COMMITTEE. The student may be allowed entry to the program not having met all prerequisites, but the completing of class work in the prerequisites areas should be completed in addition to the 45 credits of the program. The STUDENT ADVISORY COMMITTEE will evaluate the students' qualifications and schedule appropriate courses to make up any deficiencies as well as completing the 45 credit requirement for the program.

IV. The requirement for the thesis replaced with an interdisciplinary problem (project) involving several students (suggested number approximately six) who would work on a management problem of practical significance to local

or regional government. The project would require both individual research or study by each student; and, what is more important, synthesis and integration by the group of students working as a whole. Each student would be required to write an individual component of a final report, as well as participate in a joint preparation of a final synthesis chapter. This interdisciplinary project is termed a "workshop". As part of the workshop, the students in the project would meet weekly in seminar format with the professor(s) in charge of the workshop during the semester preceding the workshop. The main part of the workshop would be sandwiched between the first and second academic years of the students' program of study, and would occupy six weeks during the summer. It is important that the faculty member(s) directing the workshop be adequately compensated through appropriate honoraria. A hypothetical example of a workshop project could be that of a watershed study in which forestry practices could be evaluated in terms of effects on soil erosion, nutrient loss from the watershed, sediment transport to a waterway, fisheries, and forest species diversity. The students would evaluate the history of the problem, identify the existing problems and the dynamics of changes taking place in the physical environment and the biotic communities, and recommend various alternative management strategies in an attempt to adequately address the present and future problems within the study watershed. The workshop should be designed to provide the student with experience in synthesis and integration. Each student will write their own section of the report and then take an active part in finalizing the entire report. Summary in English should be included. Management agency staff may be asked to participate in workshop planning. Any of the staff members at IPB who participate in the master's degree program in environmental resources management should be encouraged to develop ideas that can be used in the planning of workshops, and to direct and coordinate workshops. Generally, one staff member would be needed to direct each workshop, although complex problems chosen for workshop topics could benefit from services of two workshop coordinators.

V. The proposed format of the program involves three "layers" or divisions of course selections, defined as follows: The first layer would constitute courses common to all students in the entire program. Following these common course requirements, the students would choose between land resources management and water resources management. Certain course or courses would be identified as common requirements for students choosing the land resources management area, and certain course or courses would be identified as common requirements for students in the water resources area. The students would have one additional choice to make: students in each area (land or water) would decide whether to concentrate in one of two fields. One field is for those students interested in the technical, biological, and physical aspects of environmental resource management; the other field is designed for those students interested in concepts of institutions, socio-economic, and policy issues as they relate to environmental management.

The three layers can be diagrammed as follows:



Another aspect of the format of the program involves the distribution of course credits for each of the four possible routes of instruction followed by the students. An example of a route to be followed in the program would be that of a student who chooses the biological-physical field within the land resources management program. A second example of a route to be followed is one in which a student chooses the socio-economic, policy, and institutions area within the water resources management program. For the case of either of these examples of routes to be followed, the student ideally would distribute his or her course selections in the following manner: (COURSE DISTRIBUTION)

1. Natural sciences and technology. Nine credits. Includes a required course in ecology
2. Institutions and public decision making processes. Nine credits. Includes a course in natural resource economics as a required course.
3. Analytical and design tools. Six credits. Includes (a) a course in statistics, beyond the minimum requirement of beginning statistics course, the latter being a prerequisite to being a qualified student in the program and (b) a basic systems course.
4. Synthesis and integration. Six credits. This is specifically the interdisciplinary, multiple-student project "workshop" described above.
5. Area specialty. Fifteen credits. An example of an area specialty is that of the student who concentrates on the biological and physical aspects of land resources management. It is important to note that these 15 credits are not counted toward meeting the requirements under sections 1, 2, and 3 of this paragraph. Field experience may be used for a maximum of three credits of the area speciality credits provided the STUDENT'S ADVISORY COMMITTEE approves.

The course distributions listed above are patterned after the existing water resources management program at UW-Madison. This program has proved to be highly successful in the training of natural resource managers.

The following is a further detailed example of a program suggested for a specific student. The arbitrary example is for a student interested in the biological and physical field of concentration within the water resources management program.

The student takes the following courses to meet the requirements indicated for layer No. 1 in the diagram in paragraph 5: general ecology, natural resource management, statistics, and basic systems course. (We understand the basic systems course does not at present exist on the IPB campus, but needs to be developed in the future. This course would not be as detailed as the systems course in agricultural engineering, but covers only the basic concepts of systems ecology and systems analysis. It is the single new course which we feel needs to be developed in the near future to meet the needs of the program.)

By taking the four courses just mentioned, the student has completed the first layer of required coursework and has met the requirement of taking certain specified courses in the COURSE DISTRIBUTION list. The student now moves into courses within the biological and physical field of water resources management, selected on the basis of choice made by himself and his ADVISORY COMMITTEE. The restraints at this point in his program are set on the basis of the COURSE DISTRIBUTION list (the five numbers from above). That is, the student must still fulfill the area requirements indicated on the COURSE DISTRIBUTION list. The importance of the COURSE DISTRIBUTION list cannot be overstressed; its significance is that the list insures that all students receive a certain specified breadth of training as well as 15 credits of depth within the student's area of specialization.

The COURSE DISTRIBUTION list defined here is the same as that in use at the University of Wisconsin, Institute of Environmental Studies Water Resources Management Program. (A possible change which the STEERING COMMITTEE for the master's program might wish to consider is a change from six to nine credits under the analytical and design tools section of the COURSE DISTRIBUTION list, with a concurrent shift from 15 to 12 credits under the area specialty section. It is possible that such a shift in emphasis might be more in accord with the needs at IPB.

VI. Identification of courses for inclusion in the various parts of the COURSE DISTRIBUTION list is yet to be accomplished. This job should be the work of the STEERING COMMITTEE. It will be important to include a sufficient

number of courses within each section of the COURSE DISTRIBUTION list so as to allow some latitude for students with various interests. Courses taken by a student are then selected from the various sections of the COURSE DISTRIBUTION list, based on the interests of the particular student and the advice received from the student's own ADVISORY COMMITTEE.

Philosophical commentary relevant to the MS program in natural resource management:

ADAMS:

I feel that the philosophy of the master's degree program to be developed should be one emphasizing training to prepare students to work effectively on environmental management problems of the future, as well as those of the immediate present. The development and exploitation of the immense natural resource base of Indonesia will most certainly result in serious environmental management problems which will require an interdisciplinary approach, in order to reach a solution that will be satisfactory to both the people and the government of the country. The program at IPB will need to provide for training of people to work both in the technical fields of environmental management, and, just as important, in the field of institutions, policy establishment, and decision making. Some of the serious environmental problems to be faced by Indonesia include massive deforestation and loss of species diversity within the primary tropical rainforests (rainforests which are likely the richest in the world in terms of species composition, and in which only one out of six species may have been taxonomized), soil erosion, and extensive pollution of aquatic ecosystems. For example, it is likely that very large numbers of potentially useful plant species from the primary tropical rainforests will be lost to extinction during the next 35 years in Indonesia alone. Approximately 50% of Asia's tropical rainforests (primary forests) are to be found in this country, and these forests constitute an extremely valuable and important resource base. The genetic material from these forests will be of immense value for practical purposes in the future.

PETERSON:

The philosophy which I have tried to use in the development of this master's degree program is based on some 30 years of experience in Soil and Water Conservation teaching and research at the University of Wisconsin. This includes extended periods of work in the Middle East and limited work in Thailand.

Wise use of natural resources is a responsibility which we all share. These resources have been placed here to use, not abuse. The wise development of the natural resources in Indonesia will require an interdisciplinary approach that will be extremely complicated. This means more opportunities for imaginative work. However, as anywhere in the world, future desires must be considered in line with today's necessitites.

The natural resource management program we have tried to develop is an attempt to provide a broad base at the master's degree level that will permit a reasonable approach to these many opportunities. Some may call them problems, but I feel opportunities better describes the future as they make wise use of the many natural resources which have been provided to Indonesia.

No. : 2143/A.36.03/PT.39.FPS/82
Appendix : -
Subject : Comments on the proposal made by UW-experts on the S_2 Program of PSL-IPB.
Address : To the Dean of the Post-Graduate Faculty, IPB.

Dear Dean,

It is to conform to your request that I am submitting here some comments in relation to the recommendations made by Dr. M. S. Adams and Dr. A. E. Peterson on the S_2 Program of PSL-IPB:

(1). I am in agreement with Dr. J. Murdock's view as concerns his overall non-thesis proposal. It is indeed a fact that at present, as well as for several years to come, our country is in bare need of experts of global orientation, especially in relation to problems such as faced by PSL. Nevertheless, in tackling future problems we have to find ways for solving questions of technical nature, but specifically concerned with the environment.

(2). The realization of the "Workshop" pattern in replacement of research may eventually be financed from research funds while the salaries (honoraria) be adapted to existing regulations in accord with the related research budget. In this regard, PSL is required soon to take steps in making a study on the size of the unit cost for the undertaking of a Workshop of a six-week duration. The number of credit points set at 45 may open a way to improve the image of the MS degree for this non-thesis program.

Sincerely, Deputy Dean II

Dr. Kamaruddin Abdullah

No. :

Appendix :

Subject :

Address : To the Vice Rector I
I.P.B.

Bogor, December 1, 1982

Dear Vice Rector I,

With reference to your letter No. 7006/A.36.08/PT.39/82 of November 25, 1982, I would like to give my comments as follows:

1. In principle I agree with the subdivision of PSL into two areas, Land Resources Management and Water Resources Management with the notion that Land and Water include all aspects/components/parts of the Land system and Water system. These two areas may be viewed from the physical as well as the socio-economic-cultural aspect.
2. One thing I cannot comply with is the repiacement of Thesis Workshop. The workshop system involving various students emphasizing an area of various aspects will be faced with multi-varied difficulties, mainly in their effort to synchronize the different kinds of activities (mostly research) being different for those students. Or does such a workshop system exclude the necessity of field research or field tests: I therefore suggest that every student undertake field research or field tests and write his thesis individually.
3. In view of the aim to the development of Land Resources Management and Water Resources Management the study interest of each student will be directed by the Committee in the selection of the various aspects of these areas of study.
4. With reference to point 3 above the PSL Director should actively participate in the:
   4.1. Formulation of the framework and system of study in Land Resources Management and Water Resources Management in the perspective as outlined in point 1.

4.2. The assignment of students to fill the framework mentioned in point 5.1.

4.3. Appointment of a relevant Steering Committee from the various departments.

5. The further development framework of Land Resources Management and Water Resources Management requires another phase. The study results of the students that are seemingly separated still have to be united. For this purpose, the PSL is to develop another mechanism to unite those various aspects. Such mechanism is provided, among other things, by the workshop. This workshop, however, should be separated from the assignment of the student to achieve his MS. In this workshop use is made of results obtained from discussions of research or tests made by the students. The modus operandi has to be further developed.

These are briefly my comments. Thank you very much.

Sincerely,

(Sitanala Arsyad)

Bogor, December 8, 1982

Dear Dr. Ir. Edi Guhardja
Post-Graduate Faculty
I.P.B.

Commenting on the recommendations made by Dr. M. Adams and Dr. A. Peterson as concerns the S_2 Education program of the PSL, IPB, I am of the view that their suggestions are generally acceptable and in accord with what has been discussed with us during their stay in Bogor. However, as regards the Steering Committee as proposed by them to be filled by the PSL-Director and six Deans as members, in my opinion I deem it better if the Steering Committee be composed the the respective relevant route directors at IPB. To avoid an excessive number of members in such a steering committee, I propose the possibility of establishing more than one steering committee, conforming to the number of routes existing at the PSL referred to above, i.e. Water Resources Management, Land Resources Management, and Energy Resources Management.

Thanks very much for your kind attention.

Sincerely,

(Dr. Naik Sinukaban)

No. :
Appendix :
Subject :
Address : Dear Dr. Ir. Edi Guhardja, Vice Rector I, IPB.

1. The subdivision (sub-routing) of PSL into Land Resources Management, Water Resources Management, and Energy Resources Management will simplify the routes of choice to be made in the interest of the students. The separation of the biological and physical aspect from the socio-economic policy and institution is a completely natural one in the approach to the problem.

2. In principle I am of the opinion that the Workshop route as suggested will be able to open the way for the development of a kind of a course work degree for MS program at 45 credit points (Plan B), additional to the continuation of the MS research degree program (36 credits) which currently exists (Plan A).

3. The nature and criterion of the interdisciplinary approach towards natural resource management and environment (PSL) are indeed embraced by the "workshop" idea referred to above. However, scope and depth of the so-called "individual research and study by each student" as part of this workshop still needs detailed discussion.

Sincerely,

(Syafii Manan)

VIEW AND ANALYSIS ON THE DRAFT RECOMMENDATIONS

For PSL made by Dr. M. S. Adams and Dr. A. E. Perterson

My view concerning this Draft Recommendation can be divided into three categories. The first category includes recommendations that are just and acceptable, the second class is dealing with recommendations, though acceptable yet involving rather serious consequences, whereas the thrid category is concerned with recommendations far from being acceptable.

1. Category of just and acceptable recommendations.
   - 1.1. The philosophy as developed by Dr. Adams and Dr. Peterson for the MS program in the PSL area is acceptable as completion/improvement in the formualtion of the program objective (page 6 and 7).
   - 1.2. The inadequacy in the control of the English language with respect to the capability of reading as well as speaking is an established fact and this is consequently one of the handicaps in the study of reference literature (page 1).
   - 1.3. The relation between the program and the department is considered insufficient resulting in the impediment of the development of new and old courses. This must be recognized as the current condition although the phenomenon is a general one (page 1).

2. Category of recommendations acceptable yet involving serious consequences.
   - 2.1. Efforts to improve the ability of using English or its use as a prerequisite for entering PSL is acceptable and its application for all FPS-IPB students is under consideration. The ensuing consequence is the compulsory attending of the English course at a time preceding the semester courses, during the semester; this is due to the fact that the study of English is impossible to accomplish within one or two months, but at least one year is required, and this will mean an extra load for students, extra costs, and provision for English lecturers and labs (page 1 and 2).

2.2. Salary compensation for lecturers from the departments, proportionate to the time dedicated to S_1, S_2, and S_3. Properly speaking, an additional S_0 is to be provided for. This is also felt by the Department Director, the Faculty Dean, as well as at the IPB-level, and its consequences are well-known (page 1).

3. Category of recommendations difficult of acceptance.

3.1. To set up a Steering Committee of six persons, i.e. the Deans of closely related faculties (Fisheries, Forestry, Agriculture, Agricultural Engineering, and Social Sciences). This will turn out to be an impossible accomplishment due to overload of the Deans; even if they were able to appoint their deputies, this realization is questionable taking into account the overload for lecturers and the current situation at IPB (page 2).

3.2. Changing the number of credit points from 38-39 to 45 will mean a change in the entire FPS curriculum if we do not want a FPS-PSL curriculum that is unequal to that of FPS, IPB (page 2).

3.3. To replace the Thesis by interdisciplinary research to be carried out by $\pm$ 6 students, is difficult to realize because of the great variation in interest and the small number of students (in 1982 there were only 15 new students), except if we compulsorily limit the students' interest, but this is in contrast to the suggested split into 4-6 specialization groups (page 2).

3.4 Establishment of three layers/levels of courses by dividing the students into 4-6 specializations, i.e.:

1. Land Resources Managment
2. Water Resources Management
3. Energy Resources

Again, each specialization to be further divided into:

a. Biological and physical field
b. Socio-economic policy and institutions

In this way, every generation of students will be divided into 4-6 groups. In view of the small number of students per year, the above division will meet considerable difficulty in its realization.

(not signed)