



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

630.72
I57
I573

Report of a Workshop

INTERNATIONAL WORKSHOP ON AGRICULTURAL RESEARCH MANAGEMENT

WAITE MEMORIAL BOOK COLLECTION
DEPARTMENT OF AGRICULTURAL AND APPLIED ECONOMICS
232 C. S. GARDNER HALL
1994 BUFORD AVENUE, UNIVERSITY OF MINNESOTA
ST. PAUL, MINNESOTA 55108

ISNAR

International Service for National Agricultural Research

INTERNATIONAL WORKSHOP ON AGRICULTURAL RESEARCH MANAGEMENT

7 to 11 September 1987

The Hague, The Netherlands

ISNAR

International Service for National Agricultural Research

MANAGEMENT INFORMATION SYSTEMS AND THEIR USES

Byron Mook
Senior Research Officer
ISNAR

INTRODUCTION AND DEFINITIONS

My presentation this morning will perhaps be a bit different from some of those with which you've been confronted in the first two days of this workshop. My emphasis will be less on the theoretical background to management practices, and more on PRACTICAL approaches to bringing about managerial change. Much of what I'll be talking about is based on work ISNAR has been doing in Indonesia.

Let me begin by saying just a few words about the phrase "Management Information System". These three words often sound a bit scary, I think, mainly because the phrase "MIS" has come to be associated with hi-tech approaches to management and, specifically, with computers. But none of us should be put off. One of the principal messages I hope to leave with you this morning is that we have to separate the idea of an MIS from the tools by which an MIS is implemented. Every one of the organizations represented in this room has some kind of a Management Information System already. It may be paper-and-pencil based and/or, in some cases, it may be based largely on word-of-mouth. But it is an MIS. Information does exist, it does move (at least a bit), it is managed (more or less), and it is used (to some extent).

As a result, we should try this morning to think, not about the establishment of an MIS in your organization or mine, but rather about the evolution and improvement of the MISs we already have.

To make this point clear - and so that we all have a shared understanding of what we're talking about - let's begin with a simple definition of an MIS. I'd say that the usual MIS includes four main types of information and has four main procedural components. I'll go through these two lists quickly, since I don't want to spend too much time at the beginning on what I fear may seem like

somewhat abstract definitions. Perhaps we'll come back to them later.

TYPES OF INFORMATION INCLUDED IN AN MIS

- (1) On program content. In agricultural research, what projects are actually being carried out? What are their objectives, where are they taking place, when did they begin, when will they end, and what are their expected outputs?
- (2) On personnel. Who is on the payroll? What are their educational and career backgrounds, where are they, and, most important, what projects are they working on?
- (3) On finance. How much are different programs and projects actually costing? (As we'll discuss later, one of the big challenges to an MIS - and to one of its spinoffs, a Program Budgeting System - is to allocate the approximately 65% of budget which most research organizations spend on personnel to particular research projects.)
- (4) On facilities. What buildings and equipment do research organizations have available for carrying out their research programs?

PROCEDURAL COMPONENTS

- (1) Information collection. What information exists on the four subjects mentioned above (i.e., program, personnel, finance, and facilities)?
- (2) Information movement. Where is this information? Is it only at the stations or institutes - or only at the national headquarters, or both?

- (3) Information management. How is this information handled? Who is responsible for information collection and movement? Are we talking about a largely paper-and-pencil operation, or are microcomputers being used, or do we have a combination of both?
- (4) Information use. Obviously the most important of the four components, the reason-for-being of any MIS. Who uses whatever information exists and for what purposes?

The obvious answer to this last question should be planning, monitoring, and evaluation - of program, personnel, finance, and facilities.

BACKGROUND TO ISNAR WORK IN INDONESIA

The NARS with which ISNAR has been working most closely on MIS issues is that in Indonesia. I myself have been, and continue to be, heavily involved in this cooperative program. As a result, many of the generalizations I will make this morning will undoubtedly be influenced by what ISNAR and AARD (the Indonesian Agency for Agricultural Research and Development) have been doing together.

Just a few words of background at the beginning... As at least some of you in this room will know, AARD and ISNAR are entering their seventh year of cooperation. Indonesia was actually one of the first three NARS with which ISNAR began to work. Way back in 1981, we did one of our first country reviews in Indonesia, and, since that time, we have contributed to ten other program/institute reviews. As you can imagine, therefore, the stack of ISNAR and ISNAR-related plans, recommendations, proposals, and publications on Indonesia is formidable.

The latest stage in our cooperation with AARD began last year, when we concluded an agreement to assist in what many people are today calling "second-generation institutional development problems". Such work is a logical follow-on to the system and program/institute reviews which I have just mentioned. A major theme in all these reviews has been the importance of management issues.

What are "second-generation institutional development" problems? I think that this phrase is almost certainly relevant to most of the NARS represented in this room. Not too long ago, most NARS in Asia, Africa, and Latin America had an acute shortage of men and material (i.e.,

a "first-generation institutional development" problem). But over the past 10-15-20 years, these NARS have made considerable investments in both physical and human resources (e.g. buildings/equipment and Ph.D./M.Sc.). Now much such investment is in place, buildings are finished and trainees have returned, and the challenge now is to mold these resources into an efficient and effective research program.

In Indonesia, the most pressing management issue for AARD is that the tools available to senior officials for oversight of such a large organization are little changed from what they were ten years ago. (And the organization is large, larger than any represented in this room except the Indian one. Approximately 10,000 total employees, of which approximately 2,000 are graduates and 400 are Ph.D.s. Spread out in more than 25 major centers/institutes, more than 100 stations and sub-stations, over a country 5000 kilometers long.) Most information on projects, personnel, finance, and facilities are updated irregularly. Those data which do arrive at the AARD secretariat in Jakarta are often in forms which make use by senior managers difficult. Aggregation of information from different centers and stations is time-consuming.

In short, the information necessary for either the central secretariat or the centers/institutes to allocate resources rationally or to monitor and evaluate progress is very weak.

SAMPLE OUTPUT FROM THE AARD MIS

I've distributed to you this morning several types of product from the early days of the AARD MIS. Let's look quickly at each of them, to give you a flavor of what one might expect from an MIS. If you'd like to come back to any of them in the discussion period, we can do so. (The following Exhibits are all collected at the end of this paper).

- (1) Here we have one page from a list of all research projects at one research institute. The number in the left hand column identifies the institute, the project itself, the research program of which the project is a part, and the fiscal year.

You can see, for example, that the research program on hybrid rice is composed of six discrete research projects.

- (2) Here we see what the cost of each of these six projects is and the total for the entire hybrid rice program. We can discuss later, if you wish, how these cost figures are arrived at. I SHOULD

EMPHASIZE THAT THEY ARE *NOT* THE GOVERNMENT BUDGET FIGURES; INSTEAD, THEY ARE ACTUAL USE FIGURES.

- (3) Here we see those cost figures broken down into various categories of use: e.g., personnel, materials, equipment, travel, and overhead.
- (4) Now we shift to personnel. Here we see what each person is doing. How much of his total time is he spending on research, how much on administration, and how much on training? Within research, which particular projects is he working on?
- (5) Here we cut these same personnel data another way, to look at the project first. Who is working on it, and what percentage of his/her time is he spending?
- (6) Here we look at the total cost of research work on a particular commodity, in this case legumes.
- (7) Here we look by discipline, in this case economics.
- (8) And finally, here we look at resources devoted to a particular problem, in this case brown planthopper.

USES OF THIS OUTPUT

Now what does (or can) a research manager do with such information? Obviously the payoff from an MIS comes in the use, and not in the methodology.

Let's look at *policy issues* first. The next four exhibits contain information which should be of use to four different levels of research policy maker and manager.

- (9) For top policy makers. The research institute from which these data come has the national mandate for irrigated rice. And yet, as you can see from the figures presented here, its budget is small compared to the place of rice in the national economy, a large percentage of its work is not directly related to rice, it does most of its work in one geographic area, it pays modest attention to a major pest problem, and its staff structure is changing rapidly.
- (10) For AARD management. Here we see that breeding and agronomy get most attention at this institute, and that pathology and economics get almost none.
- (11) For institute management. Here we see that the

biggest program at the institute is in rice mechanization and post-harvest technology, and that 13% of institute resources goes for legumes, maize, and wheat.

- (12) And finally, one more level down, for program management. The example here is from the rice breeding program. Four projects out of 14 consume more than 50% of resources available to the program.

And finally, let's look at *personnel issues*. Exhibit 4 above, which shows what each person is doing, is clearly and excellent tool for managers responsible for staff evaluation. And Exhibits 5 and 8 give managers a means of monitoring quickly all scientists working on particular research problems.

GETTING STARTED ON AN MIS

Now how did AARD and ISNAR go about getting started on the development and improvement of the AARD MIS? The first step, an early decision, was that we should do an intensive analysis of information available for planning, monitoring, and evaluation at one institute. We had three objectives in doing such a case study:

- (1) To find out what information the secretariat in Jakarta had available on program, finance, and personnel at the institute chosen.
- (2) To find out what information the institute itself had available.
- (3) To analyze how such information was organized, and how it moved (or did not move) between the institute and the secretariat.

As secretariat staff, institute staff, and ISNAR staff worked together on this case study, we all quickly became aware that there were multiple lists of projects supposedly being carried out, that personnel lists were generally out-of-date, and that there were minimal financial monitoring procedures. A considerable amount of information was missing, and much of what did exist was of questionable validity and reliability.

As a result of this case study, AARD and ISNAR staff worked together to develop procedures for collecting the kinds of information everyone agreed was needed,

for moving it from institutes to the secretariat (and, in some cases, the other way), for managing it (mostly using microcomputers), and - most important - for using it.

LESSONS LEARNED

What have we learned?

I believe that the lessons fall into two broad categories: considerations regarding the design of an MIS, and awareness of management constraints to the development and improvement of an MIS.

Design considerations

Here there are at least three sub-lessons.

- (1) The need for *flexibility* with regard to objectives, content, and uses/users.

Such a statement may surprise some of you. Certainly the academic literature on MIS gives considerable attention to the need to be precise about objectives, content, and uses/users AT THE BEGINNING.

But over the course of the past year, we have continually changed the content of the information being collected, the way in which it is managed, and the forms in which it is presented.

The approach, in other words, has really been a "bottom-up" one. We've preferred to let the system grow, rather than to start with a preconceived notion (or model) of what should be included and what should be accomplished.

- (2) The importance of *starting small*. Such a strategy is obviously a natural corollary of a "bottom-up" approach. Our preference for modesty has two implications.
 - (a) We have tried to include only *minimal, essential information* in the first stage of the expanded MIS. An example regarding information on personnel will illustrate this point.

When we began, some AARD officials advised that we should try to include all information on personnel now contained in individual files at the secretariat and at the institutes. Had we taken this advice, however, we would have wound up with more than 100 variables on

educational background, career, civil service status, etc. Instead, we pared such a "wish list" down to 22 variables which most officials seemed to agree were most useful for manpower and training planning.

In other words, lots of things might be interesting to know, but we have had to ask hard hard questions about our ability to collect data, to move it, to manage it, and - again, most important - to use it.

- (b) Similarly, we have moved slowly on increasing the geographic coverage of the MIS. Once again, some officials advised that we should try to include all institutes, centers, and stations in the first year. In fact, we covered only about 30% in 1986-87 - and were continually conscious of the need to get as many of our methods and procedures as correct as possible as early as possible.

Now our target for this second year, 1987-88, is to increase this coverage to about 70%.
- (3) The need to encourage *multiple uses and users*. We have continually faced the very real danger that institutes and centers will see the whole MIS enterprise as a ploy to encourage policy and management centralization. As a result, we've tried to involve such institutes/centers to the maximum extent possible from the beginning. Two activities are important.
 - (a) Tailoring the output from the MIS to the needs of center and institute managers.
 - (b) Setting up the various MIS databases at the institutes/centers themselves, so that the units of AARD become not only the providers of information but also the primary users of it.

Management Constraints

Here again there are at least two types of lessons learned.

- (1) Management attitudes may not be supportive. Do senior managers understand the need for an MIS as an input to planning, monitoring, and evaluation? And - even more important - do they really want good information?

AARD and ISNAR have discovered that the answer to the first question is not as obvious as we had thought. Managers at different levels of the system

have over time developed their own procedures for planning, monitoring, and evaluation (PME) and/or, quite often, they have developed mechanisms to avoid performing such functions altogether. The idea that PME depends on good information is not always accepted.

Nor may the basic idea of an MIS be acceptable... Managers may not want to know about the details of their research projects, personnel, and finance, and/or, almost certainly more important, they may not want others to know. Some of the types of sample output which I've handed out to you clearly have the potential for making some people uncomfortable.

- (2) The resources required for an MIS may be in short supply. Here I am talking primarily about people and, at least in some of the bigger NARS, about microcomputers.

The demands on staff time in developing and improving an MIS are not small. In Indonesia, for example, the MIS team at the secretariat level consists of people from the Program Formulation Division, the Personnel Division, the Finance Division, and the Center for Agricultural Data

Processing - all of whom, in turn, depend on people from the centers and institutes.

Part-time staff commitments, such as the ones which have been made in Indonesia, are almost certainly appropriate for the early stages of MIS work. But in the long term, full-time assignments are essential. The logical home for such staff is in units concerned with planning, monitoring, and evaluation.

With regard to micros, I hesitate to make generalizations, though I recognize that issues of new technologies for management are important ones. Clearly the sheer volume of information generated in a big NARS like the Indonesian one requires management and analysis by computer. In addition, AARD is fortunate to have substantial numbers of scientists and managers with at least some computer experience. But let me stress again, as I did at the outset, that an MIS does not depend on computers. In fact, in a small NARS, in which the volume of information required is not great, perhaps the most efficient and effective way to begin is with a good paper-and-pencil system.

As in all of research management, the substance is more important than the procedure.

EXHIBIT 1.

LIST OF PROJECTS AT SAMPLE RESEARCH INSTITUTE
1986/1987

<u>Project Number</u>	<u>Project Name</u>	<u>Program of which Project is Part</u>
3024018687	Studi Pewarisan Sifat Komponen Produksi	Pembentukan Varietas Padi Unggul dan Pewarisan Sifat
3025018687	Studi Pewarisan Sifat Cere dan Bulu	Pembentukan Varietas Padi Unggul dan Pewarisan Sifat
3026018687	Studi Keragaman Sifat Tanam Blas Pada Bebe- rapa Varietas Padi Gogo Lokal	Pembentukan Varietas Padi Unggul dan Pewarisan Sifat
3027028687	Pertanaman Sumber Persi- langan	Pembentukan Varietas Padi Hibrida
3028028687	Pertanaman Test Cross dan Back Cross	Pembentukan Varietas Padi Hibrida
3029028687	Evaluasi dan Perbanyak Cms, Maintainer dan Restorer	Pembentukan Varietas Padi Hibrida
3030028687	Studi Genetik	Pembentukan Varietas Padi Hibrida
3031028687	Perbanyak Benih Hibrida	Pembentukan Varietas Padi Hibrida
3032028687	Uji Daya Hasil	Pembentukan Varietas Padi Hibrida
3033038687	Pemupukan NPK Jangka Pan- jang Padi Sawah	Cara bercocok Tanam dan Pemupukan Padi Untuk Memantapkan Hasil
3034038687	Pupuk Azolla Jangka Pan- jang	Cara Bercocok Tanam dan Pemupukan Padi Untuk Memantapkan Hasil

EXHIBIT 2.**LIST AND TOTAL COST OF PROJECTS (BY PROGRAM)**
AT SAMPLE RESEARCH INSTITUTE, 1986-87

<u>Project Number</u>	<u>Project Name</u>	<u>Cost (Rp 000)</u>
3013018687	Daya Hasil Lanjutan Padi Gogo Rancah	6152
3015018687	Breeder Seed	11771
3017018687	Perbanyak Galur Harapan Padi Gogo	5875
Subtotal		268932
02		
3027028687	Pertanam Sumber Persilangan	6692
3028028687	Pertanam Test Cross dan Back Cross	7181
3029028687	Evaluasi dan Perbanyak Cms, Maintainer dan Restorer	9399
3030028687	Studi Genetik	9370
3031028687	Perbanyak Benih Hibrida	7306
3032028687	Uji Daya Hasil	7154
Subtotal		47102
03		
3033038687	Pemupukan NPK Jangka Panjang Padi Sawah	13904
3034038687	Pupuk Azolla Jangka Panjang	7193
3035038687	Penggunaan Bahan Organik Pada Padi Sawah	8427
3036038687	Cara Pemberian P Pada Padi Gogo	5017
3037038687	Respons Varietas Terhadap P	4162
3046038687	Pengendalian Gulma Pada Tanaman Gogo Dilahan PMK Sumatera Selatan	4318

EXHIBIT 3.

BUDGET ALLOCATION BY PROGRAM AND PROJECT AT SAMPLE RESEARCH INSTITUTE

<u>Project Number</u>	<u>Scientist Cost</u>	<u>Other Personnel Costs</u>	<u>Supplies</u>	<u>Equipment</u>	<u>Travel</u>	<u>Overhead</u>	<u>Total</u>
Pembentukan Varietas Padi Unggul dan Pewarisan Sifat							
(.....)	(.....)	(.....)	(.....)	(.....)	(.....)	(.....)	(.....)
3003018687	2,665.73	698.00	278.00	71.00	694.00	8,969.00	13,375.73
3005018687	1,102.39	347.00	132.00	36.00	347.00	4,484.00	6,448.39
3007018687	2,000.05	698.00	265.00	71.00	694.00	8,969.00	12,697.05
3009018687	596.25	1,744.00	662.00	178.00	1,734.00	22,422.00	27,336.25
3011018687	1,157.77	2,084.00	794.00	214.00	2,081.00	26,907.00	33,237.77
3013018687	800.02	350.00	132.00	39.00	347.00	4,484.00	6,152.02
3015018687	1,076.98	695.00	265.00	71.00	694.00	8,969.00	11,770.98
3017018687	519.26	356.00	132.00	37.00	347.00	4,484.00	5,875.26
86	38,439.85	15,334.00	5,868.00	1,548.00	14,919.00	192,824.00	268,932.85
Pembentukan Varietas Padi Hibrida							
3027028687	1,123.04	484.00	205.00	49.00	347.00	4,484.00	6,692.04
3028028687	1,600.33	477.00	205.00	68.00	347.00	4,484.00	7,181.33
3029028687	4,106.11	277.00	142.00	43.00	347.00	4,484.00	9,399.11
3030028687	2,484.73	1,384.00	559.00	111.00	347.00	4,484.00	9,369.73
3031028687	1,951.28	311.00	164.00	49.00	347.00	4,484.00	7,306.28
3032028687	1,719.65	381.00	173.00	49.00	347.00	4,484.00	7,153.65
12	12,985.14	3,314.00	1,448.00	369.00	2,082.00	26,904.00	47,102.14
Cara Berocock Tanam dan Pemupukan Padi Untuk Memantapkan Hasil							
3033038687	7,937.27	830.00	273.00	33.00	347.00	4,484.00	13,904.27
3034038687	1,197.29	830.00	273.00	62.00	347.00	4,484.00	7,193.29
3035038687	2,343.66	969.00	221.00	62.00	347.00	4,484.00	8,426.66
3036038687	2,002.02	415.00	123.00	62.00	173.00	2,242.00	5,017.02
3037038687	1,171.83	415.00	123.00	37.00	173.00	2,242.00	4,161.83
3046038687	1,303.12	415.00	123.00	62.00	173.00	2,242.00	4,318.12
3039038687	1,824.35	415.00	123.00	62.00	173.00	2,242.00	4,839.35
(.....)	(.....)	(.....)	(.....)	(.....)	(.....)	(.....)	(.....)

EXHIBIT 4.

STAFF (BY PROJECT) AT SAMPLE RESEARCH INSTITUTE

Name	Grade	Unit Cost	Project Number	Res Time (%)	Res Cost R'000	Admin Time (%)	Admin Cost R'000	Sht. Trm Time (%)	Sht. Trm Cost R'000	Lng. Trm Time (%)	Lng. Trm Cost R'000	Work Out (%)	Work In Cost R'000	Total Time (%)
Dr. M. Sudjadi Sudjono	P	10481	3426008687	15.0	1572	0	0	0.0	0	0.0	0.0	0	0.0	15.0
	P	10481	3112168687	10.0	1048	0	0	0.0	0	0.0	0.0	0	0.0	10.0
	P	10481	3152228687	20.0	2096	0	0	0.0	0	0.0	0.0	0	0.0	20.0
	P	10481	3115168687	10.0	1048	0	0	0.0	0	0.0	0.0	0	0.0	10.0
	P	10481	3113168687	15.0	1572	0	0	0.0	0	0.0	0.0	0	0.0	15.0
	P	10481	3153228687	20.0	2096	0	0	0.0	0	0.0	0.0	0	0.0	20.0
	P	10481	3901008687	0.0	0	5	524	0.0	524	0.0	0.0	0	0.0	5.0
Subtotal	P	10481	3902008687	0.0	0	0	0	5.0	524	0.0	0.0	0	0.0	5.0
				90.0	9433	5	524	5.0	524	0.0	0.0	0	0.0	100.0
Dr. Moch. Sultoni Arifin	ajp	3994	3905008687	0.0	0	0	0	0.0	0	0.0	0.0	100	3994.00	0.0
	Subtotal			0.0	0	0	0	0.0	0	0.0	0.0	100	3994.00	0.0
Dr. Moh. Fathan Muhadjir	ajp	9308	3064058687	12.0	1117	0	0	0.0	0	0.0	0.0	0	0.0	12.0
	ajp	9308	3902008687	0.0	0	0	0	10.0	931	0.0	0.0	0	0.0	10.0
	ajp	9308	3425008687	10.0	931	0	0	0.0	0	0.0	0.0	0	0.0	10.0
	ajp	9308	3423008687	10.0	931	0	0	0.0	0	0.0	0.0	0	0.0	10.0
	ajp	9308	3172278687	12.0	1117	0	0	0.0	0	0.0	0.0	0	0.0	12.0
	ajp	9308	3901008687	0.0	0	10	931	0.0	0	0.0	0.0	0	0.0	10.0
	ajp	9308	3183318687	12.0	1117	0	0	0.0	0	0.0	0.0	0	0.0	12.0
	ajp	9308	3403008687	12.0	1117	0	0	0.0	0	0.0	0.0	0	0.0	12.0
Subtotal	ajp	9308	3107138687	12.0	1117	0	0	0.0	0	0.0	0.0	0	0.0	12.0
				80.0	7446	10	931	10.0	931	0.0	0.0	0	0.0	100.0
Dr. Moh. Kosim Kardin	s	7019	3902008687	0.0	0	0	0	100.0	7019	0.0	0.0	0	0.0	100.0
	Subtotal			0.0	0	0	0	100.0	7019	0.0	0.0	0	0.0	100.0
Dr. Moh. Fatchurochim M.	asp	5314	3141208687	15.0	797	0	0	0.0	0	0.0	0.0	0	0.0	15.0
	asp	5314	3138208687	30.0	1594	0	0	0.0	0	0.0	0.0	0	0.0	30.0
	asp	5314	3140208687	15.0	797	0	0	0.0	0	0.0	0.0	0	0.0	15.0
	asp	5314	3904008687	0.0	0	0	0	0.0	0	0.0	0.0	0	0.0	0.0
	asp	5314	3204408687	20.0	1063	0	0	0.0	0	0.0	0.0	0	0.0	20.0
	asp	5314	3205418687	20.0	1063	0	0	0.0	0	0.0	0.0	0	0.0	20.0

(.....)

EXHIBIT 5.

PROJECTS (BY STAFF INPUTS AND COSTS) AT SAMPLE RESEARCH INSTITUTE

Project Number	Name	Grade	Unit Cost	Res. Time %	Res. Cost Rp. 000	Adm. Time %	Adm. Cost Rp. 000
3431008687	Ir. Harnoto	ajp	9308	23.40	2178.07	0.00	0.00
3431008687	Ir. Henny Mayrowani	s	7019	45.00	3158.55	0.00	0.00
				74.40	5895.10	0.00	0.00
Potential and Constraints of Maize Production in Upland Areas of Java Indonesia (ESCAP)							
3432008687	Ir. Aman Djauhari	ajp	9308	15.60	1452.05	0.00	0.00
3432008687	Ir. Adimesra Djulin	s	7019	51.00	3579.69	0.00	0.00
3432008687	Ir. Sari Sutiyo Rini	s	7019	36.00	2526.84	0.00	0.00
				102.60	7558.58	0.00	0.00
Evaluasi Kendala Pemantaalan Kredit Tenaga Ternak di Daerah Transmigrasi (Diljen Peternakan Proyek IFAD)							
3433008687	Ir. Aman Djauhari	ajp	9308	15.60	1452.05	0.00	0.00
				15.60	1452.05	0.00	0.00
Pemangkasan Tanaman Kedele Terhadap Kualitas Biji							
3434008687	Dr. Ir. Abdul Karim Makarim	ajp	9308	4.00	372.32	0.00	0.00
				4.00	372.32	0.00	0.00
Identifikasi Usahatani Di Hulu Daerah Aliran Sungai							
3435008687	Ir. Al Sri Bagyo	asp	8076	45.00	3634.20	0.00	0.00
				45.00	3634.20	0.00	0.00
Penelitian Soybean (Biaya Sadikin Somaatmadja Sendiri)							
3438008687	Sadikin Somaatmadja	ap	11,925	70.00	8347.50	0.00	0.00
				70.00	8347.50	0.00	0.00
No Kegiatan Name							
3901008687	Ir. Achmad Husni Malian	s	7019	0.00	0.00	10.00	701.90
3901008687	Ir. Widhiati Adil Hadi	s	7019	0.00	0.00	10.00	701.90
3901008687	Ir. Jaleng Sulaiman	asp	8076	0.00	0.00	2.00	161.52
3901008687	Dr. Subandi	ap	11,925	0.00	0.00	20.00	2385.00
3901008687	Ir. Endang Suhartatik	asp	8076	0.00	0.00	5.00	403.80
3901008687	Ir. Sup apto Hardjo Sumadi	ajp	9308	0.00	0.00	75.00	6981.00
3901008687	Adiono Pa. Bso	s	7019	0.00	0.00	100.00	7019.00
3901008687	Ir. Hendrik Virgilius	asp	8076	0.00	0.00	3.00	242.28
3901008687	Dr. Zainuddin Harahap	ap	11,925	0.00	0.00	30.00	3577.00
	(.....)						

EXHIBIT 6.

LIST AND COST OF PROJECTS BY COMMODITY AT SAMPLE RESEARCH INSTITUTE 1986-87

Project Number	Project Name	Cost (Rp 000)
(.....)	(.....)	(.....)
3108138687	Root Distribution and Nutrient Uptakes	6953
3114168687	Metodologi Uji Ketahanan Varietas Jagung dan Sorghum Terhadap Penyakit Utama (Bulai, Karat dll)	3955
3432008687	Potential and Constraints of Maize Production in Upland Areas of Java, Indonesia (ESCAP)	9801
Subtotal		208,818

Kacang

3436008687	Respon Kacang-Kacangan Dalam Kerapatan Populasi Tinggi Terhadap Perlakuan Zat Penghambat Tumbuh (PGR)	2242
3191348687	Pertanam Koleksi Kacang-Kacangan	6844
3155238687	Penelitian Evaluasi	11,989
3154228687	Penelitian Penyakit Bakteri Kacang-Kacangan	11,871
3401008687	Legume Cultivar Selection for Condition After Lowland Rice and Acid Soil (1984-1987)(Canada)	4452
3409008687	Food, Legume and Course Grain (1982-1987)(FAO/UNDP)	2958
3406008687	Pigeon Pea Improvement Phase II (ACIAR-8567) (1985-1988)(Australia/ACIAR)	2714
Subtotal		43,070

Kacang hijau

3119188687	Hibridisasi Kacang Hijau	4546
3122188687	Seleksi Pembentukan Kacang Hijau	4246
3129188687	Uji Daya Hasil Pendahuluan Galur-Galur Kacang Hijau	7990
(.....)	(.....)	(.....)

EXHIBIT 7.**LIST AND COST OF PROJECTS BY DISCIPLINE AT SAMPLE RESEARCH INSTITUTE 1986-1987**

Project Number (.....)	Project Name (.....)	Cost (Rp 000) (.....)
3167268687	Penelitian Daya Guna dan Hasil Guna Jasad Renik (Mycorrhiza)	4342
3168268687	Pengaruh Cara Pengendalian Gulma Pada Ubi Kayu	3793
3169268687	Penampilan Sifat Agronomis Klon Harapan Ubi Kayu	5460
Subtotal		424,835
<u>Ekonomi</u>		
3197378687	Evaluasi Program Pengapuran Dalam Rangka Peningkatan Produksi Kedelai	24,555
3433008687	Evaluasi Kendala Pemanfaatan Kredit Tenaga Ternak di Daerah Transmigrasi (Ditjen Peternakan - Proyek IFAD)	3694
3196368687	Pengaruh Penetapan Mutu Gabah/Beras Yang Dibeli BULOG Terhadap Pendapatan Petani Padi	15,369
3195358687	Dampak Program Pencetakan Sawah Terhadap Peningkatan Pendapatan	4876
Subtotal		48,494
<u>Fisiologi</u>		
3180318687	Pengaruh Curah Hujan Pada Stadia Pemasalahan Ponglong Terhadap Mutu Benih Kedelai	7874
3107138687	Pengaruh Pemakaian Mulsa Terhadap Pertumbuhan dan Hasil Jagung di Lahan Kering	4037
3183318687	Effect of Edaphic and Field Environment on Seed Quality (Kerjasama JICA)	9976
(.....)	(.....)	(.....)

EXHIBIT 8.

LIST AND COST OF PROJECTS (BY STAFF INPUTS) ON BROWN PLANT HOPPER AT SAMPLE RESEARCH INSTITUTE

<u>Project Number</u>	<u>JUDUL RPTP (Title of the Program)</u>	<u>JUDUL KEGIATAN (Title of the Project)</u>	<u>Percentage of Time Spent</u>	<u>TOTAL BIAYA</u> <u>(Budget Rp. 000)</u>
3068068687	Jud.RPTP: Penelitian Pengendalian Hama Padi/ Penelitian Ekobiologi Hama Padi Jud.Keg.: Hibridisasi dan Perkembangan Biotipe Wereng Coklat	Pelaksana: Dr. Ir. Ida Nyoman Oka Ir. Bahagiawati A.H. Ir. R.S. Djatnika Kilin	12 16 9	9,880.0
3418008687	Jud.RPTP: Kerjasama/Swasta Jud.Keg.: Penelitian, Penanggulangan Hama Padi Wereng Coklat dan Virus Lainnya (Inpres 3) 1986 (Direktorat Jenderal Pertanian Tanaman Pangan)	Pelaksana: Dr.Ir. Ida Nyoman Oka Dr.Ir. Justinus Soejitno Ir. Arifin Kartohardjono Ir. Jumanto Hardjosudarmo Ir. R.S. Djatnika Kilin Ir. Soewito Tjokrowidjojo	6 7 37 9 36 20	13,061.0
3074068687	Jud.RPTP: Penelitian Pengendalian Hama Padi/ Penelitian Ekobiologi Hama Padi Jud.Keg.: Hibridisasi dan Diskriminasi Inang Wereng Hijau	Pelaksana: Dr.Ir. Sri Suharni Siwi Ir. I. Gusti Putu Alit	40 57	13,728.0
3073068687	Jud.RPTP: Penelitian Pengendalian Hama Padi/ Penelitian Ekobiologi Hama Padi Jud.Keg.: Skrining Wereng Hijau	Pelaksana: Ir. Arifin Kartohardjono Ir. I. Gusti Putu Alit	37 38	11,747.0
3420008687	Jud.RPTP: Kerjasama/Swasta Jud.Keg.: Pengujian Insektisida Gusodrin 15 wcc Terhadap Wereng Coklat (P.T. Alfa Abadi Pestisida Industri)	Pelaksana: Panudju Pudjokaryono	9	3,185.0
Total Budget:				51,601.0

EXHIBIT 9.

Data From One Sample Research Institute

Issues For TOP POLICY MAKERS

This institute has the national mandate for irrigated rice.

- (1) Its budget is 3% of the total AARD budget. Wetland rice contributes 20% of AGDP.
- (2) 35% of the institute budget goes for research on palawija crops and cropping systems.
- (3) 89% of the budget is spent within 50 kilometers of the main station.
- (4) 3% of the budget goes for research on brown plant hopper.
- (5) 28% of the current graduate staff are on training. When they return, approximately 25% of the graduate staff will have Ph.D.'s and 25% will have M.Sc.'s.

EXHIBIT 10.

Data From One Sample Research Institute

Issues for AARD MANAGEMENT

Research Program Areas By Discipline

Plant Breeding	34%
Agronomy	26%
Agricultural Engineering	18%
Pest Management	9%
Cropping Systems	9%
Plant Diseases	4%
Agricultural Economics	0%

EXHIBIT 11.

Data From One Sample Research Institute
Issues for INSTITUTE MANAGEMENT

Research Program Areas

Rice Mechanization and Post-Harvest Technology	22%
Rice Breeding	16%
Rice Pests and Diseases	11%
Hybrid Rice	10%
Irrigation and FSR	10%
Rice Agronomy and Fertilizers	1%
Grain Legume Breeding	6%
Hybrid Maize Breeding	4%
Wheat Breeding	3%
Other	8%

EXHIBIT 12.

Data From One Sample Research Institute
Issues For PROGRAM MANAGEMENT

The Rice Breeding Program consists of 14 research activities.

Perbanyak Benih CMS dan Benih Hibrida	17.6%
Verifikasi/Uji Adaptasi Galur Harapan	12.3%
Penelitian Sumber Bahan dan Pembuatan Persilangan	11.9%
Observasi Daya Hasil	9.8%
	<hr/>
	51.6%
TEN other activities	48.4%

